

International Journal of Role-Playing

The aim of the *International Journal of Role-Playing* is to act as a hybrid knowledge network, bringing together the varied interests in role-playing from its associated knowledge networks, e.g. academic research, games, creative industries, the arts, and role-playing communities.

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Editorial

Welcome to Issue 5 of the *International Journal of Role-Playing*.

INTRODUCTION

This issue, compiled in 2014, is long overdue. During the last two years, the study of role-playing has advanced on many fora, ranging from books (e.g., Brown, 2015; Simkins, 2015) to blog posts and several new doctoral dissertations. A key theme during this time has been the segmentation of the field. We have reached the clear tipping point where following all of the research and developments taking place within the spectrum of role-playing has become practically impossible. At the same time, the number of scholars has risen high enough that it is now possible and even academically viable to become a specialist in one or a handful facets of role-playing, rather than having to be first and foremost a role-playing scholar. Similarly, others are intentionally crossing borders, both disciplinary and regional (e.g., Fedoseev et al., eds., 2015). The next two issues of *IJRP* will also reflect that shift as well.

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The articles and the book review in this fifth issue bear witness to that transformation. All of the four articles represent directions to which role-playing research is heading, sometimes following in the footsteps of other forms of game and simulation studies, at other times forging its own ways ahead. Two of the contributions discuss educational aspects of role-playing. In "Educational Larp in the Middle School Classroom: A Mixed Method Case Study," Sarah Lynne Bowman and Andhe Standiford show that adding role-playing elements to middle school science curriculum increased the students' intrinsic motivation and perceived competence in the topics being taught. Mary Lynn Crow's and Larry P. Nelson's "The Effects of Using Academic Role-Playing in a Teacher Education Service-Learning Course," in turn, examines the teacher-training side of the educational uses of role-playing.

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role-playing. In "Educational Larp in the Middle School Classroom: A Mixed Method Case Study," Sarah Lynne Bowman and Andhe Standiford show that adding role-playing elements to middle school science curriculum increased the students' intrinsic motivation and perceived competence in the topics being taught. Mary Lynn Crow's and Larry P. Nelson's "The Effects of Using Academic Role-Playing in a Teacher Education Service-Learning Course," in turn, examines the teacher-training side of the educational uses of role-playing.

With "Ecological Approach to the Performance of Larping," Marjukka Lampo continues her exploration of the still understudied topic of the performative aspects of larp and larping, while Michael Sangyeob Lee and Carrie Heeter remind us of the importance of believable characters in digital contexts, with "Cognitive Intervention and Reconciliation: NPC Believability in Single-Player RPGs." Finally, Mika Loponen and Jukka Särkijärvi provide an academic review of Jon Peterson's *Playing at the World* (2012), one of the most impressive and contested historical works on role-playing.

EDITORIAL CHANGES

This issue was also the last one edited by me. Starting from *IJRP* #6, the position of executive editor has been taken by **William J. White** of Penn State Altoona. In order to avoid conflicts of interest, I left both the editorial position and the *IJRP* board, as I took on the task of co-editing *Simulation & Gaming* from January 2016 onwards with Dr. Timothy C. Clapper and Dr. Willy C. Kriz, when the esteemed Dr. David Crookall retired.

Dr. White has contributed several articles on the study of role-playing, co-edited a book (2012) on immersive gameplay with Evan Torner, designed games, and is a member of the *IJRP* editorial board.

I sincerely thank all of the authors who have submitted to this journal, both those whose works have been published and those whose work required further refinement. I also thank all of the numerous peer reviewers who have done the anonymous volunteer work and been great at it without possibly receiving any public "thank you" for it. Finally, I thank my fellow board members, who have been there to offer their advice and help whenever it was needed.

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Educational Larp in the Middle School Classroom: A Mixed Method Case Study

Popular abstract: This mixed method case study examines the effectiveness of an educational role-playing (edu-larp) intervention into the science curriculum of a charter school in Los Angeles that serves an economically disadvantaged population. Utilizing psychometric surveys and semi-structured interviews, the investigators gathered data from middle school students evaluating their development along five dimensions of learning before and after the semester-long program: intrinsic motivation, perceived competence, school engagement, team work, and leadership. The study also gathered qualitative data from the 23 students in this convenient sample group regarding their overall experiences with the edu-larp method.

When paired with traditional pedagogy, out of these five dimensions of student development, the investigators found that the edu-larp intervention helped increase overall intrinsic motivation and interest/enjoyment of science in the quantitative data. The qualitative and quantitative findings merged to reveal improvement in perceived competence in science. In interviews, students demonstrated a strong belief that larp aided in the development of all five dimensions and expressed universal interest in learning through edu-larp in the future. Overall, the data suggested that adding the edu-larp component to the existing science curriculum impacted the experience of students by increasing interest, engagement, and perceived competence in science through game play and role enactment.

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1. INTRODUCTION

Interest in live action role-playing as an educational tool (edu-larp) has increased in recent years. Several professional organizations have emerged specializing in edu-larp, including consulting companies, after-school programs, and entire schools devoted to the method. This interest corresponds with other trends in pedagogy that favor an experiential mode of instruction, including outgrowths from drama (Mochocki, 2013), digital gaming (Whitton, 2014), and simulation (Standiford, 2014). Edu-larp in particular has emerged from the leisure activity of live action role-playing (larp), sharing many of the same benefits afforded from these cousin forms, while still remaining somewhat unique due to its roots in popular culture.

Larp is a form of game play in which participants physically embody characters within a fictional scenario for extended periods of time. Designers can set larps in any time, place, or genre. Characters range from strongly similar to the player's primary identity to completely distinct (Bowman, 2010). As a pedagogical outgrowth, *edu-larp* refers to an educational role-playing exercise in which participants adopt a new role for a long period of time in a bounded, fictional scenario that may or may not resemble mundane reality. Some edu-larp scenarios contain rules or win conditions, but not all.

The efficacy of experiential modes of pedagogy remain difficult to study. While teachers and students alike often express enthusiasm for various forms of hands-on, experiential learning, measuring

the effects of these interventions in a statistically satisfying way can prove challenging. First, the immersive experience of a method like edu-larp trains multiple skills at once rather than imparting facts in a direct delivery fashion (Henriksen, 2006; Porter, 2008; Blatner, 2009; Hyltoft, 2010). In many edu-larps, students are embodying a role other than their primary identity in a new, fictional scenario. This enactment involves processing multiple levels of social information -- including status hierarchies and socio-historical factors -- in addition to subject matter knowledge, which educators can embed in the larp from any discipline (Hyltoft, 2008, 2012). Second, well-designed edu-larps allow for a level of agency and creativity that empowers the students to make decisions in the fictional universe. Contact with subject matter facts occurs alongside this flow of creative embodiment, which can lead to somewhat amorphous or unpredictable responses in exit interviews; in other words, students may perceive the exercise as "fun" without fully reflecting upon their own learning (Henriksen, 2006; Harder, 2007; Henriksen, 2008). Third, if a student improved in their comprehension of the science curriculum, for example, how do educators determine whether that comprehension was gained during the traditional classroom education, as the result of the edu-larp education, or due to unrelated changes in their individual cognitive development?

As a consequence of these complications, current edu-larp researchers emphasize the need for embedding reliable assessment techniques into the exercises or after them (Cherif and Somerville, 1995, p. 32; Bender

2005, p. 6; Cheng, 2008, p. 14; Howes and Cruz 2009, p. 41; Sancho et al., 2009, p. 120; Brummel et al., 2010, p. 579; Mochocki 2013a, 101-111). These assessments range from self-reflections to tests. While educators have not reached a consensus regarding the best method of assessment, most emphasize the need for thorough briefing sessions before and debriefing after the experience to help cement the lessons the teachers intended for students to internalize (Cherif and Somervill, 1995, p. 29; McSharry and Jones, 2000, p. 79; Henriksen, 2006, p. 12; Martin, 2007, p. 8; Howes and Cruz, 2009, p. 42; Brummel et al., 2010, p. 577, 582; Heyward, 2010, p. 202; Aarebrot and Nielsen, p. 2012, 29; Andresen ed., 2012, p. 17; Harviainen, Lainema, and Saarinen, 2012, p. 10-11; Hyltoft, 2012, p. 21; Karalevich, 2012, p. 42; Harviainen and Savonsaari, 2013).

While research methods to establish a direct correlation between edu-larp and the retention of specific subject matter require further design, several dimensions of "soft skill" development are easier to measure. Experiential learning is often praised for increasing intrinsic motivation, as the students are granted agency within the exercise to perform actions rather than passively receiving material, which encourages a desire for success (Whitton, 2014; Hyltoft, 2010, 2012). Researchers also claim that edu-larp specifically increases self-efficacy and perceived competence (Blatner, 2009; Balzac, 2011; Hoge, 2013, p. 48-49). Additionally, the method may increase school engagement in students, as facts take on new meanings within the fictional setting and the role encourages them to see connections between the subject matter and potential practical application (Howes and Cruz, 2009, p. 34). Edu-larp and other role-playing exercises are also often used as ways to increase team work in various settings (Sancho et al., 2009, p. 111; Hoge, p. 2013, 48), as well as platforms to practice leadership skills (Hyltoft p. 2010, p. 53).

As researchers cite edu-larp as improving many dimensions of student development (see Figure 1), this mixed method exploratory case study examines a class of middle school students according to five factors: intrinsic motivation, perceived competence, school engagement, team work, and leadership. The study explores the influence of a semester-long, science edu-larp curriculum on middle school students in a disadvantaged area of Los Angeles by collecting data from observational reports, quantitative surveys, and qualitative interviews. The investigators also gathered data on media engagement in order to ascertain potential similarities in interests with larp genres or barriers to entry into the content of the intervention. The research questions are as follows:

1. Do self-reported scores in intrinsic motivation, perceived competence, school engagement, team work, and leadership change in the participants after the addition of edu-larp to the curriculum?
2. How does adding an edu-larp component into a science curriculum impact the scholastic and social experience of the participants?
3. In what ways do the quantitative and qualitative findings converge?

The goal of this study was to gather thorough data from students assessing their own development along these various dimensions before and after the intervention, as well as to evaluate their overall experiences with the edu-larp method. The investigators hypothesized that the edu-larp intervention would help increase these five dimensions of student development when paired with traditional pedagogy, although the design was exploratory in nature.

Other case studies have attempted to measure the pedagogical benefits of experiential learning, as shown in the literature review below. However, to the investigators' knowledge, no study exists that has collected mixed method data on an edu-larp intervention according to all five of these dimensions.

Out of these five hypothesized dimensions, the quantitative data revealed that students' overall intrinsic motivation and interest/enjoyment of science significantly increased over the course of the semester. The qualitative and quantitative findings converged to reveal an increase in perceived competence in science. In the ethnographic interviews, students expressed a strong belief that larp aided in the development of all five dimensions and a unanimous interest in learning through edu-larp in the future. The data did not reveal significant changes in the areas of team work and leadership between the two time points, although several students offered examples in which these two factors were exercised during the course of the edu-larps.

The quantitative results remain limited due to the lack of availability of a control group and the small sample size. In addition, the quantitative questions did not evaluate the effectiveness of edu-larp specifically, but rather asked students to measure their overall competencies in these areas over time. Therefore, conclusions cannot be drawn about edu-larp as a specific factor from the quantitative data alone, as students also experienced traditional pedagogy curriculum during the time of the study. However, the qualitative interviews,

which asked specific questions regarding the edu-larp pedagogy, revealed a strong student belief in the effectiveness of the method along all the dimensions of learning and a great degree of enthusiasm for the method. Overall, the conclusions of this exploratory pilot study are not generalizable, but may serve as a useful starting point for future edu-larp research.

2. LITERATURE REVIEW

Literature extolling the benefits of role-playing as an experimental training method are already prevalent in several disciplines unrelated to the larp leisure activity. Edu-larp follows the theoretical principles of the educational theories of experiential learning (Kolb, 1984) and situated learning (Lave and Wenger, 1991). According to Kolb (1984), experiential learning posits that knowledge is acquired through concrete experience (doing), reflective observation (thinking back to the experience), abstract conceptualization (forming a theory about what was observed), and active experimentation (testing the new theory). In situated learning, Lave and Wenger (1991) explain that learning does not occur in a vacuum and is socially co-constructed in a dynamic physical environment. Furthermore, Dreyfus and Dreyfus (1980) theorize through the use of hermeneutic phenomenology that expertise is gained through extensive experience rather than solely from book knowledge.

Bowman (2014) provides an extensive, if not exhaustive, review of the benefits of experiential learning streamlined with current research in edu-larp. This literature review includes segments of that larger chapter, providing a condensed summary of these various dimensions of student learning (see Figure 1) and a consideration of the significance of edu-larp within a larger context, similar to previous work by Kot (2012).

Several forms of experiential learning currently exist in pedagogy. *Game-based learning* is a form of education that includes systems for success and failure, but may not involve a role. *Simulations* attempt to replicate real world scenarios in low-consequence contexts and generally involve some degree of role. *Drama* is a form of theatrical enactment that avoids extensive scripting in favor of role-based, collaborative improvisation into a fictional situation. *Role-playing* refers to the act of adopting a new role for a long period of time in a bounded, fictional scenario that may or may not resemble mundane reality. *Role-playing games* include systems for bounding the reality of this fiction, often including rules for success and failure. *Edu-larp*, therefore, has all the properties of a role-playing scenario and may or may not feature systems for success and failure; the edu-larp

literature includes scenarios that are purely experiential and ones with game systems.

Ultimately, each of these categories overlap to some degree. Therefore, for the purpose of this review, literature regarding educational drama, simulation, game-based learning, and edu-larp are considered alongside one another as cousins (Mochocki, 2013), indicating similarities within the discourse regarding their benefits. Also, this review only covers English-speaking literature, while several useful sources exist in other languages. Though many of these articles on experiential learning feature theoretical concepts or anecdotal data, a few studies have conducted more rigorous assessments, as noted at the end of this section.

Figure 1: Cognitive, affective, and behavioral dimensions of student learning through edu-larp (Bowman, 2014).

Dimension	Student Development
<i>Cognitive</i>	<ul style="list-style-type: none"> • Active engagement* • Critical ethical reasoning • Exercising creativity, spontaneity, and imagination • Intrinsic motivation* • Improved problem-solving skills • Learning multiple skills and knowledge bases simultaneously • Self-efficacy, perceived competence
<i>Affective</i>	<ul style="list-style-type: none"> • Active engagement* • Enhanced awareness of other perspectives • First-person identification improving emotional investment • Increased empathy • Increased self-awareness • Intrinsic motivation* • Raising social consciousness • Social skills development, e.g. cooperation, debate, negotiation
<i>Behavioral</i>	<ul style="list-style-type: none"> • Active engagement* • Exercising leadership skills • Intrinsic motivation* • Improving team work

* Literature suggests that intrinsic motivation and active engagement have cognitive, affective, and behavioral facets (Eggen and Kauchak, 2012; Fredericks et al., 2005).

Many educators advocate the use of role-playing in the classroom, particularly as a means to teach social sciences (Howes and Cruz, 2009, p. 33; Simkins, 2011, p. 68; Carnes, 2011). An early adopter and developer of simulations, the U.S. military has recently

developed full-scale role-playing exercises in order to prepare soldiers for immersion into battlegrounds and new cultures such as Afghanistan and Iraq (Bowman, 2010, p. 95-97; Stark, 2012; Vanek, 2012). The therapeutic method of psychodrama uses role-playing exercises to help patients practice new social skills, work through trauma, and increase empathy (Blatner, 2009). Role-playing is also used in psychological training for professionals (Howes and Cruz, 2009, 37; Brummel et al., 2010, p. 575). A multitude of experimental improvisational drama groups, such as the Theater of the Oppressed and Healing the Wounds of History, use theatrical and role-playing methods in order to encourage individuals to engage with social issues (Bowman, 2010, p. 40-41). Medical simulations help students learn spontaneous problem solving, as well as “soft skills” such as bedside manner (Bowman, 2010, p. 100-102; Brummel et al., 2010, p. 573-589; Ladhani et al., 2011, p. 31; McCabe, 2013, p. 38-41). Many businesses employ role-playing exercises in order to train employees in customer service, sales, team work, and leadership (Ruben, 1999, p. 502; Henriksen, 2004, p. 11; Griggs 2005, p. 60; Howes and Cruz, 2009, p. 33; Balzac, 2011; Hou, 2012, p. 212; Andresen 2012, p. 17; Harviainen, Lainema, and Saarinen, 2012). In addition, role-playing is useful in pedagogical training itself (McSharry and Jones 2000, p. 74-75; Blatner, 2009; Howes and Cruz, 2009, p. 37; Crow and Nelson, 2015).

In the leisure setting, role-playing games offer the benefits of creating community, improving problem solving, enhancing social skills, and providing opportunities for identity exploration (Bowman, 2010). Some larps focus on fantasy, science fiction, horror, or post-apocalyptic genres, whereas the Nordic larp tradition often tackles real world social issues through intense, immersive scenarios, attempting to raise consciousness on important topics from multiple perspectives (Stenros and Montola, 2012). Regardless of the setting and format, edu-larp emerges from these game-based leisure activities rather than the aforementioned professional contexts, offering the potential benefits of both spheres. While some larps feature a game-like structure with win conditions, others focus less upon concrete goals and more on the overall experience, which will vary from participant to participant. Not all larps are “games” in the sense of providing systems for success and failure.

Edu-larp has received significant recent scholarly attention, e.g. the Role-playing in Games Seminar (2012) in Finland, the Living Games Conference (2014) in New York, the Edu-larp Sweden (2014)

in Gothenburg, and the Edu-larp CPH conference (2015) in Denmark. Several examples of edu-larp exist throughout the world, including the ELIN Network; the all-larp Danish boarding school Østerskov Efterskole and the larp-oriented Efterskolen Epos; organizations such as the Swedish LajvVerkstaden; the Norwegian Fantasiforbundet; and the American Seekers Unlimited and Reacting to the Past. Various other outgrowths exist in countries as diverse as Finland (Pitkänen, 2014), Brazil (Bettochi, Klimick, and Rezende, 2012), Poland (Mochocki, 2013, p. 68), Russia (Kot, 2012, p.118-119; Fedoseev, 2012), Belarus (Kot, 2012; Karalevich, 2012, p. 37), Taiwan (Cheng, 2008, p. 2), and Korea (Sellar, 2012, p. 9-12).

Although the method is diverse enough for educators to apply to any field (Hyltoft, 2012, p. 3), role-playing seems especially suited for social studies (Howes and Cruz, 2009, p. 33-46; Simkins, 2011, p. 68), including history (Harder, 2007, p. 230; Hyltoft, 2008, p.17; Porter, 2008, p. 230; Blatner, 2009; Howes and Cruz, 2009, p. 33-46; Bowman, 2010, p. 98-100; Carnes, 2011; Simkins, 2011, p. 71-72; Jansen, 2012, p. 31-32; Karavelech, 2012, p. 36-44; Aarebrot and Nielsen, 2012), government (Ruben, 1999, p. 502; Simkins, 2010, p. 68-70), religion (Harder, 2007, p. 232; Porter, 2008, p. 230-235), and economics (Henriksen, 2004, p. 11; Larsson, 2004, p. 244; Simkins, 2010, p. 72-73; Hyltoft, 2012). Edu-larp is also exceptionally useful in the study of Language Arts (Simkins, 2011, p. 193-200), including public speaking (Martin, 2007, p. 9; Cheng, 2008), secondary language acquisition (Harder, 2007, p. 234; Harviainen and Savonsaari, 2013), and exploration of literature (Bender, 2005; Blatner, 2009). While Mochocki critiques edu-larp’s effectiveness in science education (Mochocki, 2013), other educators find the form helpful to teach science (Cherif and Somervill, 1995; Blatner, 2009; Howes and Cruz, 2009, p. 33; Brummel et al., 2010, p. 573; Simkins, 2011, p. 73-74; Hyltoft, 2012, p. 20; Fedoseev and Vdovenko, 2014) and math (Harder, 2007, p. 230; Hyltoft, 2008, p. 20; Blatner, 2009; Heyward, 2010, p.198).

As detailed in Figure 1, role-playing offers many potential benefits over traditional education, including increased self-awareness (Downing, 1994, p. 4; Harder, 2007, p. 231; Larsson, 2004, p. 245; Karalevich, 2010, 42), critical ethical reasoning (Brummel et al., 2010, p. 575; Simkins, 2010, p. 73; Simkins, 2011, p. 215; Hoge, 2013, p. 49), and empathy (Harder, 2007, p. 231-234; Porter, 2008, p. 234; Howes and Cruz, 2009, p. 42; Bowman, 2010; Simkins, 2010, p. 212; Meriläinen, 2012, p. 59).

Most relevant to our current study, educational role-playing research often focuses upon the experiential

medium as potentially intrinsically motivating (Larsson, 2004, p. 243; Guenther and Moore, 2005; Henriksen 2006, p. 11; Carnes, 2009; Sancho et al., 2009, p. 111; Brummel et al., 2010, p. 580; Heyward 2010, p. 200; Hyltoft 2010, p. 48; Andresen, 2012, p. 17; Hou, 2012, p. 211). The traditional learning method promotes a certain level of passivity, as students are expected to receive and assimilate information from the instructor (Henriksen, 2006, p. 11; Porter, 2008, p. 230; Blatner, 2009; Hyltoft, 2010, p. 51), whereas the open, participatory nature of role-playing lends to a higher degree of active engagement and participation (McSharry and Jones, 2000, p. 74; Howes and Cruz, 2009, p. 34; Hyltoft, 2010). The method may also improve feelings of self-efficacy and perceived competence through goal setting and achieving (Balzac, 2011), allowing individuals to contribute their personal talents to the success of the group (Hoge, 2013, p. 48-49), which may increase the student's sense of agency and empowerment (Henriksen, 2004; Harder, 2007; Blatner, 2009). Role-playing is often used as a method of increasing leadership skills (Downing, 1994, p. 15; Hyltoft, 2010, p. 53; Hyltoft, 2012, p. 20) and team work (Karalevich, 2012, p. 37; Guenther and Moore, 2005, p. 59; Jansen, 2012, p. 32).

As edu-larp research is still developing, the majority of these sources emphasize theoretical principles regarding these benefits or feature anecdotal, observational reports from designers and educators. However, a few studies include some degree of data collection. Sancho et al. (2009) collected grades and student evaluations after an online role-playing exercise used as a method to improve team work (2009). Similarly, in a language role-play study, Cheng (2009) used open-ended questions and quizzes regarding comprehension of persuasive techniques. Hou et al. (2009) provide quantitative support for their claim that online role-playing improves cognitive skills such as motivation. Guenther and Moore (2005) evaluated their leadership scenario with open-ended qualitative survey questions; responses indicated improvement in communication skills, depth of comprehension, and critical thinking. Howes and Cruz (2009) used a similar method to evaluate their scenario for science pedagogy, showing an increase in sensitivity to diversity and empathy. Harviainen, Lainema, and Saarinen (2012) also asked students open-ended questions to explore the limitations and impediments to a business simulation, finding issues with unrealistic trust, competitive play, and cheating. Brummel et al. (2010) used a quantitative and qualitative mixed method design to evaluate their role-play on teaching responsible conduct of research, demonstrating increases in engagement

and depth of understanding. Crow and Nelson (2014) also used a mixed method design with questionnaires and focus groups to examine the effectiveness of role-playing scenarios for training future coaches and physical education teachers, finding that students exhibited skills in the trained techniques and gained confidence. Each of these studies involved university or graduate level participants.

A few studies exist on edu-larp in secondary education. Mochocki (2014) evaluated edu-larp by assessing history subject matter retention over time in Polish high school students using a mixed methods design. A study by Harviainen and Savonsaari (2013) used teacher observations and reflective writing as a means to gather data on two edu-larps at the high school level in Finland: one focusing on secondary language acquisition, music history, and health education; the other emphasizing debate skills and empathy. Pitkänen (2014) used the stimulated recall method to study the effectiveness of historical edu-larp in producing empathy in students. In addition to increased empathy, the study found that students were intrinsically motivated to perform historical research by the scenario (Harviainen and Savonsaari, 2013). Pitkänen also attempted the stimulated recall method when studying how game design affects student thinking at Østerskov Efterskole, though further data gathering is needed for solid conclusions. Gjedde (2013) also studied students at Østerskov in a year-long mixed method study, investigating the edu-larp curriculum with regard to creative thinking linked with intrinsic motivation, as well as social creativity through participatory culture. Gjedde found that some students were motivated by the emotional, narrative elements of the game, whereas others found motivation in the strategic or competitive game properties. Additionally, the study reveals that students at Østerskov scored just as well on standardized tests as the national average in all subjects and slightly above average in specific areas (p. 195).

A recent NCSBN National Simulation Study in the field of nursing simulation was conducted over two years, 10 schools, and 666 students (Hayden et al., 2014). The study examined actual competence and perceived competence of students in three groups: a control group that experienced traditional clinical hours and less than 10% simulation; a group that experienced 25% simulation in their curriculum; and a group that experienced 50% simulation. The investigators found no significant differences in test scores in any of the groups, which indicates that simulation education is at least as effective as traditional teaching in nursing. Pertinent to our

current study, the group that received 50% simulation rated their performance as statistically higher than that of their peers and often reported feeling “very well prepared” for their profession, indicating higher self-confidence – i.e. perceived competence -- than the other students in the study (p. S38).

Our case study contributes to this body of literature by providing exploratory quantitative and qualitative measurements of the impact of edu-larp on American disadvantaged middle school students along five dimensions of learning: intrinsic motivation, perceived competence, school engagement, team work, and leadership. To our knowledge, no mixed method studies exist that examine an edu-larp curriculum according to all of these measurements, though some of the above-mentioned studies examine individual dimensions.

3. METHOD

3.1 Participants

The study participants were economically disadvantaged students from a middle school class in a charter school located in inner-city Los Angeles.¹ In the spring of 2013, the educational larp non-profit organization Seekers Unlimited (501c3) was invited to introduce edu-larp into the science curriculum in order to improve engagement. The primary investigator serves remotely from Austin, Texas, as Secretary on the Board of Directors for the organization. As Seekers Unlimited was offered the opportunity to run edu-larps for a local class for the entire semester, the group of 24 students provided a convenient sample for research. The study was approved by the IRB for both Ashford University and the University of Texas at Dallas.

The school involved in the study serves minority students, most of whom are impoverished by district standards, with 98% receiving free or reduced cost meals. While collecting demographic information regarding income level can prove difficult when studying underprivileged adolescent populations, the amount of free or reduced cost meals indicates the number of students whose families live between 130-185% below the poverty level (USDA, 2013). One quarter of the students at the study school are learning English as a second language. Students at the school perform well, scoring higher than the school district average on the California Standardized Test (CST) for science (see Table 1).

Table 1: School statistics of the study school vs. the Los Angeles Unified School District (LAUSD) as a whole

	Study School	LAUSD
<i>Ethnicity</i>		
African American	128 (39.8%)	63,714 (9.6%)
Hispanic or Latino	181 (56.2%)	478,943 (72.3%)
White not Hispanic	0 (0%)	66,833 (10.1%)
English Learners	83 (25.8%)	180,495 (27.3%)
Free or reduced cost meals	306 (98.1%)	489,777 (76.7%)
CST Science (grade 5, 8, and 10) % proficient and above	Total tested: 60 (58%)	Total tested: 143,094 (51%)
CST Science (grade 5, 8, and 10) % basic and above	Total tested: 60 (92%)	Total tested: 143,094 (77%)

Before data collection, the study was explained to students by a research assistant. Students were given the opportunity to give written and verbal assent and received consent forms for their parents to sign and return. Students were offered \$10 gift cards to Wal-mart for participation at both time points. All but one of the students returned signed consent and assent forms and two students were absent from school at T2 for the quantitative surveys. Therefore, the collected research includes 23 out of 24 students with qualitative data for both time points and 21 students with both quantitative and qualitative data for T1 and T2.

3.2 Design

The investigators used a quasi-experimental, concurrent mixed methods design with parallel data collection on a convenient sample. The primary investigator gathered observational, quantitative, and qualitative data at the beginning and the end of the semester. Collecting data with more than one method helps acquire richer, more complete data than a single method does (Tashakkori and Teddlie, 2003).

The project examined five overall dimensions of learning: perceived competence, intrinsic motivation, school engagement, leadership, and team work. The

¹ In order to preserve anonymity, the grade level, names of students, teacher, and school are not included in this study.

project also evaluated student interest and excitement for the edu-larp program. While the investigators planned to compare standardized achievement scores as well, the class' teacher failed to provide the student' final grades after the intervention, a problem other edu-larp researchers have faced (Mochocki 2014).

Due to the single class of the small charter school, which only had one class per grade, no control group was available. Therefore, a comparison group was impossible and artificially establishing one -- e.g. not allowing some children to participate in the larp intervention, which offered financial incentives and involved dedicated class time -- would be unethical according to U.S. Institutional Review Board protocols. The mixed methods design of this study is grounded in a pragmatic paradigm, meaning that less emphasis is placed upon perfect experimental technique and more upon getting the most complete data possible within the given framework (Feilzer, 2010). Ideally, future iterations of this study should involve a control group.

3.3 Apparatus and Materials

Quantitative questions were entered into an online LimeSurvey, which students took as a group in the school's computer lab. In addition to collecting demographic information, the investigators utilized three psychometric surveys: the Intrinsic Motivation Inventory (IMI) (Ryan, 1982), the School Engagement Scale (SES) (Fredericks et al., 2005), and the Student Self-Report Team work Assessment (SSRTA) (Zhuang et al., 2008). The investigators utilized only four of the IMI subscales: Interest/Enjoyment, Perceived Competence, Effort/Importance, and Value/Usefulness. According to McAuley et al. (1989), the IMI had previously shown good internal consistency ($\alpha=.85$). The subscales Interest/Enjoyment ($\alpha=.78$), Perceived Competence ($\alpha=.80$), Effort/Importance ($\alpha=.84$) also had good internal consistency. Confirmatory factor analysis showed a moderate correlation between the subscales and exploratory factor analysis indicated an adequate fit (McAuley et al., 1989). Tsigilis and Theodosiou (2003) found adequate to high intraclass correlation for Perceived Competence (ICC = .61), Effort/Importance (ICC = .60), Interest/Enjoyment (ICC = .86) and for the overall scale (ICC = .70). The investigators also found that the IMI was temporally stable; e.g. the IMI is capable of measuring change over time (ICC = .92 - .60). Reliability and validity data are not reported for the Value/Usefulness subscale, though the scale was used by previous researchers (Deci et al., 1994). The SES was found to have good reliability ($\alpha= .63 - .90$)

and demonstrated criterion-related validity (Fredericks et al., 2011). Zhuang et al., (2008) found good reliability for the three subscales of the SSRTA ($\alpha= .88, .80, \text{ and } .78$). Confirmatory factor analysis revealed that the 30-item SSRTA was a moderately good fit (CFI=.85). The variables were moderately to highly correlated ($r =.59 - .79$).

Qualitative data was collected by the primary investigator via individual semi-structured interviews and recorded on an MP3 player. The investigators designed the qualitative interview questions for both T1 and T2 (see Appendix A). Overall, the questions were structured to mirror the language and information of the quantitative surveys in order to compare the results from the two methods. The investigators also added questions to the T1 interviews to address outside factors such as interpersonal harmony in the classroom, engagement with media, and excitement level about the project. At T2, questions were added to assess specifically how edu-larp enhanced the learning experience and student eagerness to try the method in the future (see Figure 5). As the qualitative questions were designed by the investigators for the purposes of this study, no tests for reliability with other items on the quantitative scales were possible, although some of the questions overlap. In addition, tests for reliability for ethnographic questions are not normative in qualitative research. Therefore, only the quantitative surveys have reliability information.

All data was kept on the investigators' computers and reviewed only by the investigators.

3.4 Procedure

Data was collected at two time points: in February 2013 before the intervention and in May 2013 after the addition of edu-larp to the science curriculum. Observational data was obtained by the primary investigator, who watched the teacher conduct the class for two hours at T1. The class took the quantitative surveys in unison using an online website accessed in the school's computer lab. The primary investigator conducted semi-structured qualitative interviews one-on-one in a mostly private study room at T1 and outside on a table in the schoolyard at T2. Therefore, the participants were in the presence of their peers for the surveys, but not the interviews. Their teacher was not present for any of the data collection.

Between T1 and T2, Seekers Unlimited piloted 8 free edu-larps over the course of a semester, each custom-designed to address specific concepts in the established science Core Curriculum. Each edu-larp scenario featured a different theme:

- 1) The Balloon Race, an exercise in which students competed in teams to move helium balloons around the classroom demonstrating velocity and forces;
- 2) Be Your Own Planet, in which students created stars, planets, moons, and comets in a solar system with bags and shredded paper in order to demonstrate density, mass, and volume;
- 3) The Great Phlogiston Debate, in which students played famous male and female scientists from the Enlightenment explaining their physical science and chemistry theories at a French salon;
- 4) Two larps called Element Hero, in which students created superheroes based on elements from the periodic table in order to fight an evil magician robot;
- 5) Noir, a murder investigation using acids, bases, and PH, in which students took turns playing detectives, suspects, and forensic scientists, ultimately culminating in a trial;
- 6) A student-teacher exercise in which the class taught each other scientific concepts from the Core Curriculum;
- 7) A Frankenstein-based "Monster Maker," in which students used organic Chemistry to create modeling clay monsters representing the six main chemical ingredients in life. Students could attack one another's monsters by successfully answering science questions devised by the class and approved by the teacher.¹

These edu-larps were designed to illustrate concepts on the upcoming CST exam through experiential means. Each edu-larp generally lasted one class period on one day of a school week (less than one hour), with supplemental instruction on these scientific concepts through traditional teaching and group work the rest of the week. Some of these larps were more game focused and some were more role-play focused. The designers introduced role-taking activities slowly over the course of the semester so students would become acclimated to the new format. While Be Your Own Planet featured some degree of personal identification with the planet as an abstract identity, students did not fully enact characters until the Great Phlogiston Debate. Some larps featured both roles and win conditions, such as superheroes defeating the magician in Element Hero by answering science questions. Other larps

¹ Interview data only provided brief descriptions of each of the games in question. Full scenario descriptions and instructions are still in development by Seekers Unlimited for 2015 availability.

focused mostly upon immersion into the scenario, such as students playing scientists in a French salon describing their theories or playing teachers explaining scientific concepts to one another.²

In order to avoid influencing the results of the data, the investigators knew little of the proposed science edu-larps at T1 except for possible genres. The investigators were not present for the delivery of the edu-larps, as they lived approx. 2000 km away from the school at which the data was collected. Data was taken before the intervention began and after the larp curriculum was completed with little contact with the game designers regarding the content of the larps or specific student performance during the games. Similarly, the larp designers were not present at either data collection point. Qualitative and quantitative data were collected simultaneously, primarily due to the geographical distance between the data collection site and the researchers' homes. In order to integrate the two forms of data, the investigators planned to quantitize the qualitative interview data and perform a statistical analysis of the answers gleaned from interview questions (Sandelowski, Voils, and Knafl, 2009).

Therefore, the data presented in this study features student reactions from the end of the semester, not following each of the larps. The primary investigator also conducted 20-30 minute, semi-structured interviews with the class' teacher at T1 and T2, as well as a 1.5 hour interview with Aaron Vanek, one of the two larp designers, at T2.

3.5 Data Analysis

The investigators fully transcribed the qualitative interviews and coded them thematically (Braun and Clarke, 2006; King, 2011). Quantitative data was analyzed using SPSS version 22 to calculate descriptive statistics and test for pre-post differences using paired samples t-tests and one-way analysis of variance (ANOVA). Due to the one-group design of this study, the best statistical test was the Student's t-test. The investigators did, however, divide the group by gender and ran ANOVA to examine variables. After consulting with a statistician, the investigators determined that the lack of dependent variable for this study, which necessitated multiple t-tests without the benefit of Bonferroni correction, puts the results at risk for Type 1 error. However, since the study lacked a comparison group

² The cost for each of these larps ranged from a few dollars for printing fees to a maximum of a hundred dollars for props or materials. These costs are significantly lower than most classroom games that require computer technology.

and the investigators uncovered no published studies that might suggest a possible dependent variable with this exploratory design, analytical options remained limited. Future studies should consider this limitation in their design and attempt to incorporate a dependent variable and control group.

In order to merge the qualitative and quantitative data, the investigators chose to quantitize the ethnographic results and contrast them with the quantitative results (Creswell, 2003; Teddlie and Tashakkori, 2003; Hayden et al., 2014). The investigators both examined all participant interviews, summarizing responses to interview questions into one- or two-word responses, a relatively easy task as most of the young participants were quite terse. For each question, the investigators designated the range of responses on a 5 point scale: yes, mostly, sometimes, a little, and no. The number of responses were tallied and summarized in charts and bar graphs (Bowman and Standiford, in 2014), an example of which appears in Figure 3. Quantitized results were also examined for normal distribution, mean, standard deviation, percentages, and statistically tested using Student's t-test (see Table 6). Effect sizes for paired-samples t-tests were not included, as sizes would appear overestimated for this type of analysis.

Additional spontaneous responses to semi-structured interview questions were organized according to themes and quantitized in a manner similar to previous thematic phenomenological work by the primary investigator (Bowman, 2013). For example, coding, organizing, and tallying data according to themes revealed that 18 out of 23 students spontaneously mentioned liking experiments in science at either T1 or T2, a significant finding considering the experiential learning aspect of edu-larp.

4. RESULTS

4.1 Demographic Characteristics

The class contained 14 Hispanic students, 8 black students, and 1 multiracial student (see Table 2). More than half of the students spoke Spanish and Spanish was a first language for 7 students. There were no significant differences in survey results with regard to age, gender, race/ethnicity, or language spoken ($p > .05$).

4.2 Observational Results

The primary investigator was only able to study the classroom during T1, as the students were taking their yearly standardized assessments during T2. At

Table 2: Demographic characteristics of the sample

	N	Valid %
Age		
13	12	53.3
14	10	43.5
15	1	4.2
Gender		
Male	14	58.3
Female	9	37.9
Race/Ethnicity		
Black	8	33.3
Latino	14	58.3
Multiracial	1	4.2
First Language		
English	11	47.8
Both English and Spanish	5	30.4
Spanish	7	21.7

T1, the investigator witnessed a daily class meeting in which students were encouraged to express concerns pertaining to their school experience, which mainly consisted of complaints about uniform enforcement. The investigator also witnessed a student-developed skit enacting the American pioneer days for History, suggesting that larp-like activities were already present in the curriculum.

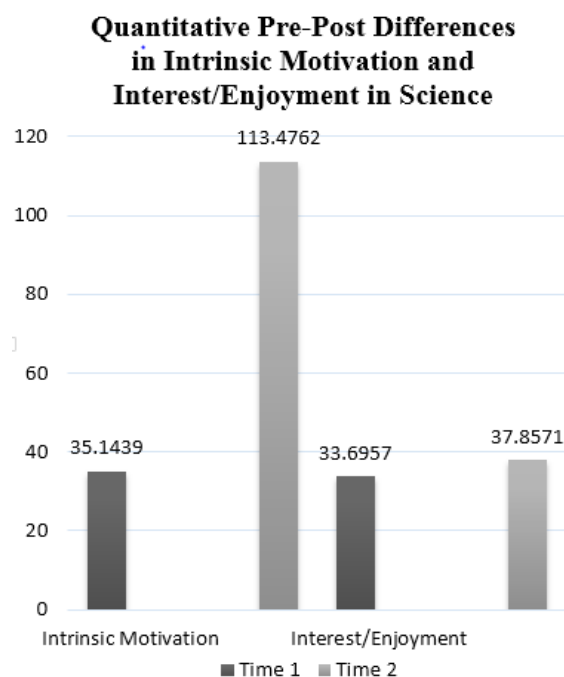
Overall, the students were respectful and engaged, but unruly, with the teacher having to ask several to leave the class for "time outs" for talking and off-task behavior. These behavioral issues were also prevalent during the quantitative data gathering in the school's computer lab. Both the teacher and Vanek, the edu-larp designer, described the class as particularly chaotic and unruly compared to other groups, with the teacher expressing the school's leniency for disruptive behavior as frustrating at T1. However, students displayed an overall respect for authority to the investigator, the teacher, and the principal during the observational period. The participants were cooperative and curious during the semi-structured interviews, particularly during T2, expressing a great deal of enthusiasm for the edu-larp intervention (see Figure 5). As the charter school requires an extensive application process, the investigators suspect that the student engagement with school and science is likely higher than average in their geographic area, as supported by the higher scores on the science assessments (see Table 1).

4.3 Quantitative Results

All variables met assumptions of homogeneity of variance and normal distribution (Levene's $p < .05$). T-tests revealed significant pre-post change for intrinsic motivation ($t = -32.00$, $df = 21$, $p < .001$) (see Table 3) and the intrinsic motivation subscale Interest/Enjoyment ($t = -2.59$, $df = 21$, $p < .05$) (see Table 4). Both results are reported in a bar graph in Figure 2.

Quantitative results revealed no significant pre-post change for school engagement (see Table 5), team work, or the other intrinsic motivation subscales (effort/importance, value/usefulness, and perceived competence). In other words, only intrinsic motivation and interest/enjoyment increased from Time 1 to Time 2.

Figure 2: Quantitative pre-post differences in intrinsic motivation and interest/enjoyment by measuring scale mean scores



The Intrinsic Motivation Inventory ($\alpha = .80$) had good reliability in this sample and the Student Self Report Team work Assessment ($\alpha = .91$) had excellent reliability. However, the School Engagement Scale had poor reliability ($\alpha = .51$) in this sample.

The investigators also ran ANOVAs to examine gender differences in the sample. At Time 1, boys reported significantly greater enjoyment of science, $F(1, 21) = 10.24$, $p < .01$, perceived competence in school, $F(1, 21) = 5.68$, $p < .05$, value/usefulness of science $F(1,21) = 7.81$, $p < .01$, intrinsic motivation for

science $F(1, 19) = 5.92$, $p < .05$, and behavioral engagement in science $F(1,21) = 7.12$, $p < .05$. At Time 2, the gender differences had equalized somewhat; the only area where boys continued to report higher levels was enjoyment of science, $F(1, 19) = 5.90$, $p < .05$. In summary, the larp intervention may have helped increase girls' confidence and may have enhanced their belief that science is useful to them.

4.4 Statistical Analysis of Quantitized Ethnographic Data

T-tests of the quantitized ethnographic data revealed significant change in perceived competence in science ($t = -2.64$, $p < .05$) (see Table 6). When the investigators selected only for students who self-rated as low performers (those who rated their perceived competence as less than 3), they found a greater pre-post difference in perceived competence in science ($n = 5$, $t = -3.50$, $p < .05$) and perceived competence in school ($n = 5$, $t = -5.30$, $p < .01$). In other words, the interview data suggests that students believed their abilities in science had increased over the course of the semester, especially those for who previously believed themselves to have low competence.

4.5 Qualitative Results

As the semi-structured format is more flexible, the interviews allowed for a greater diversity of data, including specific responses regarding the edu-larp intervention. The qualitative portion of the study examined seven major dimensions at both time points: enjoyment of science, perceived competence in science, enjoyment of school, interpersonal harmony, team work, leadership, and interest in larp as a pedagogical method. Data taken at Time 1 also assessed student engagement with the media, gaming, and generic fiction.

Data taken at Time 1 assessed student engagement with the media, particularly television, film, books, and games. These questions were intended to gauge whether the population showed a predisposition toward game play and toward the genres explored by the upcoming larps, such as detectives, superheroes, science fiction, fantasy, and history. Only one student reported having tried analog role-playing, having played a session of *Dungeons & Dragons* before. Several students showed a predisposition toward game play, with 15 out of 23 enjoying games and 5 enjoying only some games. Students reported video games, board games, sports, and other physical play activities in this general category. Video games listed included mainly first-person shooters, racing games, building simulators, and some RPGs.

Table 3: Time 1 to Time 2 comparison of Intrinsic Motivation, School Engagement, Self-Reported Team work scales.

Paired Samples Test								
	Paired Differences					T	df	Sig. (2-tailed)
	Mean	SD	SE of Mean	95% CI				
				Lower	Upper			
Intrinsic Motivation	-78.33	11.22	2.45	-83.44	-73.23	-32.00	20	.00*
School Engagement	-.19	8.63	1.88	-4.12	3.74	-.10	20	.92
Self-Reported Team work	8.52	24.85	5.42	-2.79	19.84	1.57	20	.13

Table 4: Time 1 to Time 2 comparison of Intrinsic Motivation subscales.

Paired Samples Test								
	Paired Differences					T	df	Sig. (2-tailed)
	Mean	SD	SE of Mean	95% CI				
				Lower	Upper			
Interest/Enjoyment	-4.24	7.50	1.64	-7.65	-.83	-2.59	20	.017*
Perceived Competence	-2.00	5.62	1.23	-4.56	.56	-1.63	20	.119
Effort/Importance	-.86	3.45	.75	-2.43	.72	-1.14	20	.269
Value/Usefulness	-1.33	4.18	.91	-3.23	.57	-1.46	20	.159

Table 5: Time 1 to Time 2 comparison of School Engagement subscales.

Paired Samples Test								
	Paired Differences					T	df	Sig. (2-tailed)
	Mean	SD	SE of Mean	95% CI				
				Lower	Upper			
Behavioral Engagement	-.48	3.19	.70	-1.93	.97	-.69	20	.50
Emotional Engagement	.19	5.35	1.17	-2.25	2.63	.16	20	.87
Cognitive Engagement	.10	3.77	.82	-1.62	1.80	.12	20	.91

Several of the boys in the class regularly played video games together in a team self-dubbed “the Bros,” indicating both active engagement in game-play and team work, important components of some edu-larp curricula. However, the girls in the class seemed mostly excluded from these activities, with one female reporting having difficulty interacting with boys due to their interest in games.

In terms of media genres, 5 students showed interest in detective stories in film, television, books, and games; 6 in superheroes; 6 in science fiction; 13 in fantasy; and 4 in history. These results indicate a student population fairly predisposed to engage with the content of the edu-larps with surprisingly little inherent resistance, possibly due to the rising

popularity of video games and genre-based fiction aimed at a young adult audience.

The primary investigator further questioned the students regarding their enjoyment of science in an attempt to gauge their interest level. At Time 1, students in the case study showed a moderate degree of enjoyment, with 11 reporting in the unqualified affirmative. This number rose to 13 after the intervention at T2, with three students showing an increase. However, when asked if larp helped increase their interest, 19 students reported in the affirmative, indicating that the method itself was enjoyable for several of the students who otherwise felt ambivalent or disinterested in science (see Figure 4).

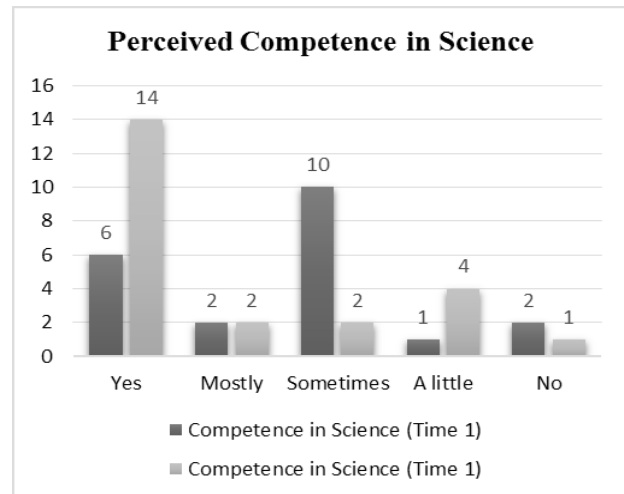
When queried about reasons for enjoying science at T1, 18 spontaneously reported favoring hands-on experiments: a high majority. 5 described liking to learn how the world works, including building and taking apart items. 3 described science as boring and 2 found science confusing. 14 students disliked reading the textbook, 5 disliked writing, and 7 were frustrated sitting in class listening to lectures. These reports indicate a preference for active engagement with course material, suggesting a possible fit with the edu-larp approach, which includes a high degree of participation, student agency, and movement.

Students reported a strong enthusiasm for the larp method in the science classroom at T2. Three students expressed disliking science until the edu-larps, with 2 indicating that they only enjoy science while larping. 8 students stated that larp made science more exciting, “fun,” or interesting; similarly, 8 students indicated that the “fun” of learning while playing made the subject matter less “boring” and increased “attention.” 2 students indicated a higher degree of comprehension of material and 4 appreciated the physical nature of larp, as opposed to sitting and taking notes. These findings correlate with the T1 preferences for experimental, hands-on activities; one student further indicated that the role-playing method offered an additional advantage to other classes that “just do experiments.” Two students expressed previously disliking science, but now “liking” or “getting the hang of it.” Only one student stated sometimes preferring to hear a lecture over playing a game, though the same student reported enjoyment of edu-larp in other areas of his interview.

The interviews revealed a large shift in perceived competence in science from T1 to T2 (see Figure 3). While several students expressed enjoyment of science at T1, a significantly lower number felt competent in the subject. At T2, the number of students expressing unqualified perceived competence jumped from 6 to 14. 13 believed that edu-larp as a method specifically increased their competence, with 4 more finding that edu-larp increased competence some of the time. Two students explained understanding the solar system, atoms, and density more thoroughly as a result of the larps. Other students described how larp helped them learn in a “different way” and increased comprehension. Some cited the role-playing, or “acting out,” aspect as particularly helpful in aiding understanding. One student stated that larping had the students learning information above and beyond the necessary facts, such as how to investigate as a detective. Although in 6 of the interviews the primary investigator neglected to ask the follow-up question

on larp helping increase competence, overall, most students reported that larp was helpful.

Figure 3: Perceived competence in science at Time 1 and Time 2.



The study also sought to measure the impact of edu-larp on student enjoyment of education and perceived competence in school as a whole. Overall, student sentiment toward school as a whole did not change dramatically over the course of the semester; about half the students reported enjoying school with an unqualified affirmative at T1 and only 7 reported an unqualified affirmative at T2, which transpired during their yearly standardized assessment.

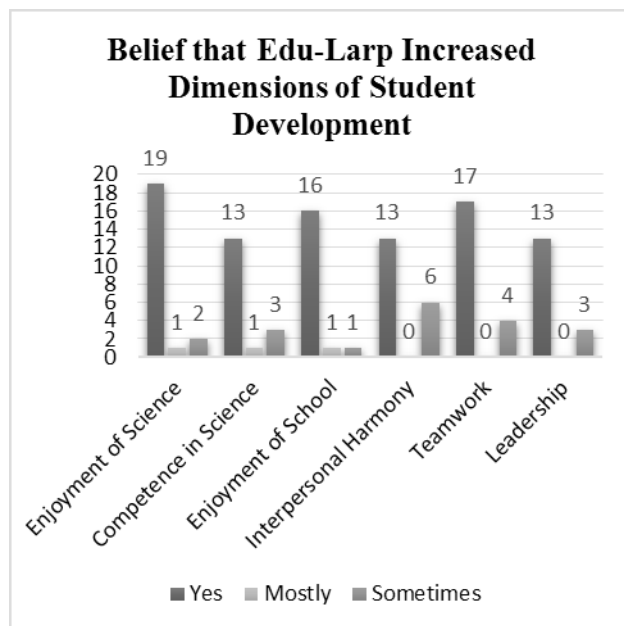
When asked to share aspects of education they dislike at T1, 4 students mentioned the length of classes and 3 called school “boring” at times. 2 disliked “having a lot of work” and one found school stressful with his extracurricular activities. When asked about desired changes to school, 6 mentioned more physical education or playing outside. 2 described sitting still in class as difficult. Many of these complaints are common in the current traditional educational system.

Though these overall complaints did not change much after the intervention, 3 students mentioned school as a necessary means to improve their lives in the future. However, 16 of the students believed that larp increased their enjoyment of school when prompted. 8 indicated that either they or their fellow students expressed excitement for edu-larp, with one female student sharing that she knew that students would have a “good day” when the class larped. One student stated that he previously “goofed off” in science before edu-larp. Another stated that in an exercise where she had to play a teacher educating the class, the larp encouraged her to “think” and

“pay attention.” Another student reported that the class was “hyped” up for days about the larps because the exercises were fun.

The study sought to examine the degree to which larps might affect the social dynamics of the classroom, including interpersonal harmony between peers and the development of prosocial skills such as team work and leadership. Overall, 13 students felt they got along well with their peers at T1, with the number raising to an unqualified 19 at T2. 13 students believed that edu-larp helped improve relations (see Figure 4), while several explained that group cohesion depended on the larp in question. 6 stated that larp encouraged them to interact with everyone in the classroom, including students they normally would not, which helped them become better acquainted. One exception to larp’s tendency to increase interpersonal harmony was an incident when a student was interrogated as a suspect by his peers in the detective scenario and became upset with the other students afterward.

Figure 4: Belief that edu-larp increased enjoyment of science, competence in science, enjoyment of school, interpersonal harmony, team work, and leadership at Time 2.



The investigators also evaluated the degree to which larp improved team work. The number of students who assessed themselves as good at team work rose from an unqualified 12 to 17 at the two time points, with 4 other students reporting “sometimes” and “mostly.” Similarly, 17 felt that larp increased their team work, with 4 replying “sometimes.” Some students reported that not all the games included team activities, though respondents mentioned 5 edu-larps as involving team work: the detective,

monster, superhero, balloon race, and teaching games. Several students reported learning concepts from their peers and sharing ideas through group work, preferring interaction to learning from a book. Most of the students found learning in a group in a playful manner more “fun.”

The study further investigated leadership skills before and after the intervention. Some students showed leadership at T1. 3 of the students were involved in the ROTC at school teaching young cadets and 2 mentioned taking a leadership role in sports. 5 felt they were role models to fellow students and were capable of influencing behavior. Several students disliked leadership, listing reasons such as discomfort speaking aloud, as well as difficulties getting other students to listen to them or take assignments seriously.

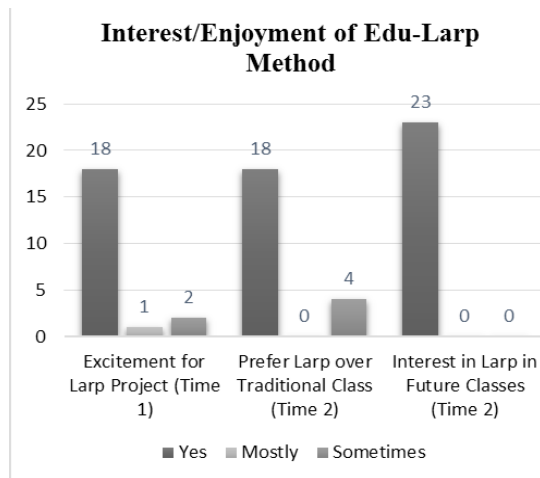
Student beliefs about their leadership skills remained roughly the same overall at T2, even though 13 believed that larp increased their abilities and 6 thought larp helped sometimes. 4 students described playing a leader in the superhero game and 3 in the detective game. Other games that students cited involving leadership were the monster game in which students had to answer questions as a team to save their monsters, the larp in which students had to teach one another, and the Phlogiston Debate, where students played scientists convincing one another of their theories. One student reported encouraging students to work “instead of slack off.” Others suggested that the teams worked together to solve problems. One student mentioned that his team members aided him in understanding scientific concepts that he previously did not comprehend.

Finally, student interest in larp as a whole was investigated at both time periods (see Figure 5). While not all students fully understood the concept of larp, most showed a high degree of interest in starting the method, with only 3 qualifying their enthusiasm. 7 were excited by the novelty of the project and curious to try new methods. 3 looked forward to interacting with students in new ways, 3 liked “hands-on” projects, and 4 were excited to engage in active participation rather than sitting and taking notes.

After the intervention, students showed the same degree of enthusiasm, with only 1 student preferring traditional class to larp. 13 mentioned the activity as “fun,” 3 found it “less boring,” 6 were pleased with the interactivity, and 5 mentioned not having to read or take tests. 6 students mentioned the ability to act in character and play a role as stimulating. Responses

to the difficulty of the games varied; one student mentioned sometimes feeling confused or finding the material “hard,” whereas another student called the exercises “easier” than normal class. One student mentioned not learning as much as a normal workbook assignment. Ultimately, all 23 students in the study expressed interest in trying edu-larp again in future classes, with one expressing regret that he will likely not experience edu-larp in high school.

Figure 5: Interest/enjoyment of the edu-larp method at Time 1 and Time 2.



5. DISCUSSION

5.1 Overview of the Findings

The investigators successfully gathered thorough data from students assessing their own development along five dimensions of learning before and after the semester-long edu-larp science program: perceived competence, intrinsic motivation, school engagement, team work, and leadership. The study also successfully acquired qualitative data from the students in the sample group regarding their overall experiences with the edu-larp method.

The quantitative data revealed an increase in overall intrinsic motivation and interest/enjoyment of science between the two time points. The qualitative and quantitative findings merged to reveal improvement in perceived competence in science. In ethnographic interviews, students expressed a strong belief that edu-larp aided in the development of all five dimensions, as well as interpersonal harmony and enjoyment of school. The students expressed excitement for the intervention and a unanimous interest in learning through edu-larp in the future. The data did not reveal significant changes in the areas of team work and leadership between the two

time points, although several students offered examples in which these two factors were exercised during the course of the edu-larps.

Qualitatively, the participants expressed a high degree of interest in edu-larp. They also expressed that the method helped them enjoy and feel more competent in science as a whole. Several students mentioned that they were excited to come to class on larp days, with a couple of students mentioning they only liked science when paired with larp. Similarly, students rated their competence in science as having increased over the semester, with 17 students believing that edu-larp helped improved their abilities. Students discussed how acting out the concepts in science worked to increase their comprehension of material.

When comparing the two data sets, adding the edu-larp component to the existing science curriculum may have impacted the experience of students by increasing interest, engagement, and perceived competence in science through game play and role enactment. However, further research is needed to establish causation, as explained in the limitations section below.

5.2 Limitations

One limitation of the study was the lack of a comparison group, as the school was small and only one science class for that grade existed. This problem was unavoidable given the circumstances of the convenient sample. As a result, the small, non-random sample reduces the generalizability of the study, though researchers may find the data useful for further avenues of research.

After consulting with a statistician, the investigators determined that the study lacked a dependent variable, which necessitated multiple t-tests without the benefit of Bonferroni correction and put the results at risk for Type 1 error. However, since the study lacked a comparison group and the investigators uncovered no published studies that might suggest a possible dependent variable with this exploratory design, analytical options remained limited. Future studies should consider these limitations in their design and attempt to incorporate dependent variables and a control group.

In addition, though the teacher planned to take assessments of the students' abilities in science before and after the intervention, these assessments were not performed. The teacher also failed to supply grades from the current year, making a pre- and post-comparison of grades impossible. Therefore, data

revealing the actual competence was not available to complement the findings on perceived competence.

Another limitation was that the T2 data was collected at the end of the semester rather than after the individual edu-larps. The investigators live in Texas rather than California and had limited time and funds. Therefore, they were not present to collect observational or behavioral data during the edu-larps themselves. The period of time between T1 and T2 was an entire semester featuring multiple activities, which made determining a causal connection between edu-larps and the quantitative measurements difficult. The ethnographic interviews helped address this issue by allowing students to directly express their perceptions of the edu-larp interventions in question, though the amount of time elapsed between the larps and the interviews may have affected student responses.

Disagreement existed in the data between the two methods in some cases. For example, the perceived competence in science result was non-significant from survey data ($p=.119$), but was significant in the quantitized interview data ($p=.015$). The methods also disagreed in terms of their ability to measure edu-larp as a specific factor. The quantitative questions measured interest in science overall, which students may or may not have attributed to the edu-larp curriculum. Alternatively, the ethnographic questions specifically asked students to assess edu-larp as a method by asking additional questions that allowed for semi-structured responses. Therefore, more positive findings in all areas were revealed in the qualitative interviews, perhaps as the result of the student excitement for game play in the classroom rather than general improvement.

Some questions were repeated in the quantitative and qualitative surveys, such as "Do you enjoy science?" The investigators found this extra data taken in another manner useful, as the quantitative survey was quite lengthy. The primary investigator observed fatigue and distraction during the 94 question survey. These factors may have contributed to the poor reliability of the School Engagement Scale in the sample.

Finally, as with any study measuring the perception of subjects who have knowledge of the intervention in question, potential bias in the responses is possible, a phenomenon known as the Rosenthal effect. For example, students may have responded in the affirmative to questions about larp increasing their perceived competency in science due to their knowledge that the intervention was designed to facilitate this increase. Also, students may respond

positively due to the direct questioning by the investigator, who they perceive to be an authority figure. While these limitations are problems inherent to many studies involving participant responses, the investigators trust that the subjects responded truthfully when prompted. Additionally, the investigators were not involved with the intervention itself, in part so that students would perceive this detachment as more neutral. Future studies could augment the participant-response method with behavioral measures (Magee, 2014), though such a design would further increase the complexity of the study.

Ultimately, while the quantitative results are limited due to the lack of the control group and small sample size, the qualitative results strengthen these conclusions by featuring questions specifically geared toward the edu-larp pedagogy. Therefore, the conclusions of this pilot study are not generalizable, but should serve as a useful starting point for future edu-larp research.

5.3 Findings Compared with the Literature

Overall, the participants were already highly engaged with school and interested in science before the intervention. This finding is probably due to the fact that the charter school format requires an application process and screens applicants for school engagement and achievement. Students reported a high degree of interest in "experiments" in science at T1, as well as some interest in generic fiction and games. Thus, the group was likely to find the edu-larp format appealing, as indicated by their initial enthusiasm to engage in the project and their excitement for larp after the intervention.

The major finding of the quantitative surveys was that larp significantly improved enjoyment of and intrinsic motivation for science. These results harmonize well with the qualitative findings. This data supports the notion present in much of the literature suggesting that edu-larp promotes intrinsic motivation through active engagement with the material and a desire to perform well in the scenario (Larsson 2004, 243; inspiring similar degrees of motivation (Whitton, 2014). However, former Østerskov teacher Sanne Harder (2007) warns against assuming that all edu-larps are intrinsically motivating by nature, insisting that it is safer to think of them as a means to organize teaching rather than a way to make learning more inherently entertaining (p. 233). Edu-larp expert Thomas Duus Henriksen (2006) emphasizes that an excess of "fun," might disrupt the learning process, asserting that frustration should be the primary driver by utilizing the desires and needs of the

Table 6: Mixed Methods (Quantitized) Results: T1-T2 comparison of perceived school competence and perceived science competence

	Paired Samples Test							
	Paired Differences					T	Df	Sig. (2-tailed)
	Mean	SD	SE of Mean	95% CI				
				Lower	Upper			
Perceived Competence, Science	-1.04	1.89	.40	-1.86	-.22	-2.64	22	.015*
Perceived Competence, School	-.17	2.25	.47	-1.15	.80	-.37	22	.714

participants in the embedded structure of game play (p. 12). Therefore, if edu-larp tends to encourage intrinsic motivation, such motivation must include curriculum-related outcomes within the structure to remain effective.

The mixed method approach allowed the investigators' to discover data in multiple ways, a benefit not available in a single-method study. Quantitative data alone would not have revealed increases in perceived competence, but the extensive interviews and quantitized qualitative data offered additional insights. This finding resonates with edu-larp theory regarding self-efficacy and perceived competence. As Balzac (2011) explains, the edu-larp process can enhance student feelings of self-efficacy through setting and achieving goals, a concept closely related to perceived competence. Larp youth camp organizer Mark Hoge further describes how games often encourage participants to share their unique skills and perspectives in order to increase the success of the group as a whole (Hoge 2013, 48-49). This sort of empowerment is not always afforded to young people, who often rely on adults to make decisions for them or to force them into a course of action (Blatner, 2009). This finding also resonates with the NCSBN National Simulation Study on nursing, which revealed that students with more experience in simulation rated their confidence in their abilities as higher than their peers did (Hayden et al., 2014).

Another interesting finding was a shift in gender differences from T1 to T2. Quantitative data taken at T1 revealed that boys reported significantly greater enjoyment, intrinsic motivation, behavioral engagement, and value/usefulness in science. In addition, the boys reported higher perceived competence in school than girls. By T2, these gender differences had equalized somewhat, as the only area where boys continued to report higher levels was enjoyment of science. This finding connects with the ethnographic data regarding the gender differences, with many of the boys involved in a video gaming group called the "Bros" that did not include female students and several of the girls reporting disinterest

in games. By T2, the girls in the class reported enjoying the edu-larp format, indicating a greater inclusivity in game activities in the sample group after the intervention.

Statistically, no significant increases in team work and leadership were revealed from T1 to T2. This finding may result from the fact that several students initially reported competence in these areas. Additionally, the larps were not specifically structured to improve leadership and team work in the way that other scenarios are (see Guenther and Moore, 2005). In order to measure improvement in these dimensions, the investigators' suggest rigorously designing edu-larps that encourage students to take turns in leadership roles and work together in teams to solve problems. Examining past scenarios and assessments in the fields of edu-larp, simulation, and educational drama may help further develop edu-larp curriculum and establish measurable outcomes in these areas.

While the data did not suggest strong increases in overall team work abilities, the semi-structured interviews revealed that the collaborative nature of the group work in the edu-larp classroom helped students learn from one another and get along better (Figure 4). Students appreciated the ability to interact with their peers in new ways, particularly with individuals outside their normal friend groups. One exception to larp's ability to increase interpersonal harmony was an incident when a student was interrogated as a suspect by his peers in the detective scenario and became upset with the other students afterward. This participant probably experienced a sense of *bleed*, where in-game emotions affected his out-of-character feelings toward others (Montola, 2010; Bowman, 2013). Thus, facilitators should pay close attention to classroom power dynamics when assigning potentially sensitive roles and remain aware of potentially triggering situations (Kessock, 2013; Brown, 2014). Harviainen and Savonsaari (2013) suggest that teachers should only implement highly emotional edu-larps if they know the classroom dynamics well.

Similarly, regardless of the statistical findings, several students did report adopting a leadership role in the scenarios, with a few indicating that their leadership led their group to victory in the games. In any given classroom, not all students will exhibit a preference for leadership or facility with the skill. Also, designing edu-larp scenarios that allow students the opportunity for equivalent leadership roles is difficult. However, edu-larp does provide a unique environment in which students may occupy roles that would they would not otherwise find available to them, such as the hostess of a French salon in the eighteenth century or a detective in a murder investigation. For example, one student shared, "We did [the] detective game and I actually felt like I was actually a detective. *laughs* And then we did a superhero and I had. . . a really awesome power, so I did feel like a leader." Another student expressed great enthusiasm for the investigation game, stating, "I told my mom when . . . I was five years old, I said 'I want to be a detective.' So, once I got to [play] it at school, I was like, 'No way. I'm finally a detective!'" Vanek further explained that one of the students had asked specifically for a detective scenario; therefore, *Noir* was designed according to student demand. The empowerment involved in the agency afforded by such roles, whether leadership or otherwise, is considerable.

Ultimately, while further research is needed to investigate the generalizability of the findings of this case study, the data indicates strong potential for edu-larp as a method of classroom engagement. These results resonate with learning theories that posit experiential learning (Kolb, 1984) and situated learning (Lave and Wenger, 1991) as beneficial to knowledge acquisition and training of expertise (Dreyfus and Dreyfus, 1980).

However, the efficacy of any program depends upon the success of facilitation on the part of the designer and/or teachers; in this case study, the designers were present for most of the scenarios and the teacher indicated a high degree of willingness. The teacher, who had never previously larped, now plans to use the curriculum in future classes without the designers present and is adding her own tweaks to the systems in order to adjust for classroom dynamics.

As with any innovation, no one method should be viewed as a "cure all" for education's problems. However, this study indicates that edu-larp offers opportunities for greater motivation, engagement, interaction with peers, collaboration, and comprehension of material.

6. CONCLUSION

To the investigators' knowledge, this study is the first of its kind in terms of comprehensive, mixed methods analysis of edu-larp with regard to several dimensions of learning. For this reason, the study contributes rigorous data analysis to the existing body of research, which generally features theoretical or anecdotal reports. Though the generalizability of this study is limited, it suggests to educators the usefulness of edu-larp as a pedagogical technique to engage and motivate students in an active, hands-on manner.

Integrating the edu-larp method into a traditional curriculum requires streamlining during the briefing and debriefing/reframing process. Streamlining the material learned during edu-larp with regular classroom lessons is crucial for the method's success. As our current generation continues to engage in a more interactive, game-focused manner than previous classroom models can support, educators are challenged to find innovative ways to engage students. While not the only method, edu-larp offers a low-cost, highly-engaging option.

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APPENDIX A*Semi-Structured Interview Questions:**Time 1 Questions:*

Do you like to watch TV? If so, what shows do you like?

Do you like to watch movies? If so, what movies do you like?

Do you like to play games? Why or why not?

What are some of your favorite games? What do you like about them?

Do you enjoy science? Why or why not?

Do you think you are good at science?

Do you enjoy school as a whole? Why or why not?

Do you feel that you are good at school as a whole?

What do you wish you could change the most about school?

Do you get along well with other students?

Do you feel that you work well with other students in a team? Can you think of an example?

Do you consider yourself a good leader amongst your friends? Can you think of an example?

Are you excited about the project?

Do you have any questions for me?

Time 2 Questions:

Do you enjoy science? Why or why not?

Do you like science more after playing the role-playing games this semester?

Do you think you have improved at science? If so, do you think the games helped you learn science?

Do you prefer the role-playing game format or regular class periods when the teacher lectures?

Do you enjoy school as a whole? Why or why not?

Do you feel that you are good at school as a whole?

Do you think the role-playing games increased your interest in your school work?

Do you get along well with other students?

Did the role-playing games help you get along better or worse with other students?

Do you feel that you work well with other students in a team?

Do you consider yourself a good leader amongst your friends?

Did the role-playing games help you take on a leadership role better or worse?

What were your favorite parts about the role-playing games?

What were your least favorite parts about the role-playing games?

Would you like to learn through role-playing again in the future? Why or why not?

What would you change about the role-playing games if you could?

Do you have any questions for me?

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The Effects of Using Academic Role-Playing in a Teacher Education Service-Learning Course

Popular abstract: Academic role-playing is one of the more effective active-learning instructional strategies currently being used at the American university level in the preparation of future educators. This mixed methods study is an investigation of the use of role-play in an undergraduate university course designed to prepare students to become public school coaches and physical education teachers. The five original vignettes that were role-played were specifically written to prepare the students to successfully handle situations they might reasonably encounter in their future work. The role-play model used in the research was originally created by the Shaftels in the 1960s, but several creative variations devised by the current investigators were added to that model for this study causing it to be an adapted version. Data collected included questionnaire responses from two different questionnaires, information from a focus group, and observations by the two investigators. Investigators concluded that the students not only exhibited skill in the techniques used to resolve the issues in the vignettes, but that students gained confidence the more they participated in the role-plays which occurred over a 4-week period. The students themselves reported that learning from one's peers, trying out their ideas in a safe environment, being forced to plan an intended outcome in advance, and hearing feedback from others were their most valued experiences. They also overwhelmingly reported preferring role-play to the more traditional university lecture method.

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1. INTRODUCTION

Academic role-playing is one of the more effective and frequently used active learning instructional strategies currently being used at the American university level in the preparation of future educators.¹ If the focus of instruction is the learning of new skill sets, role-playing those skills in a realistic yet safe classroom environment allows students to implement them correctly in a mentored and structured learning setting. It also allows students to gain the confidence to execute them appropriately in the real world. The investigators used several varieties of a classic academic role-playing strategy in a course designed to prepare students to become future coaches and physical education teachers. This particular course was also designed as a service-learning course in which students served as volunteer student teachers in after-school programs for area schools by coaching team sports and facilitating content-specific events and activities. The role-playing vignettes that were acted out were specifically designed to prepare the students to successfully handle situations that might reasonably arise both in their service-learning activities and when they become full-time physical educators. The purpose of this study was to determine the effects of using the role-playing strategy with a group of student teachers. The success, or lack of same, was to be determined according to three factors: student attitudes toward participating in the strategy, their skill level while role-playing the required skills, and the degree of confidence they expressed toward the use of these skills in the future as compared to

learning the same content through a lecture format. The specific research questions were: will the use of the adapted version of Shaftel's role-play model (1) increase students' classroom interaction with peers and with instructors? (2) increase students' positive responses to course content? (3) increase students' confidence toward their future participation in the service-learning activity as well as in their student teaching?

Academic role-playing (not the same as role-playing games) can be defined as the involvement of participants and observers in a real problem situation along with the desire for resolution and understanding that this involvement engenders (Joyce, Weil, and Calhoun, 2009). The role-playing process provides a live sample of human behavior that serves as a vehicle for students to (1) explore their feelings; (2) gain insights into their attitudes, values, and perceptions; (3) develop their problem-solving skills and attitudes; and (4) explore subject matter in varied ways (Joyce and Weil, 1980). According to Henriksen (2004), role-play is "...a medium where a person, through immersion into a role and the world of this role, is given the opportunity to participate in, and interact with the contents of this world, and its participants" (p. 108). Seaton, Dell'Angelo, Spencer, and Youngblood (2007) suggest the use of role-play to help in the development of self-awareness, self-regulation, and self-monitoring. In a Finnish study of role-playing games, Meriläinen (2012) describes the self-reported social and mental development of role-players. Specific skills that can be gained by role-play include modifying one's performance in light of

feedback, becoming a good listener, showing sensitivity to social cues, managing emotions in relationships, and exercising assertiveness, leadership, and persuasion (Elias et al, 1997). Karwowski and Soszynski (2008) used role-play successfully to train undergraduate education students in creativity, but they also believe that it can develop a capability for constructive criticism. Sileo, Prater, Lukner, Rhine, and Rude (1998) suggest role-playing as well as service-learning as appropriate strategies to facilitate pre-service teachers' active involvement in learning.

According to Randel, Morris, Wetzel, and Whitehill (1992), students should not be expected to learn to deal with complexity unless they have the opportunity to do so, and the authors of the current study believe that role-playing provides an opportunity to address such complexity. In a study designed to compare lecture versus role-playing in the training of the use of positive reinforcement, Adams, Tallon, and Rimell (1980) found that the performance of the lecture-trained staff was stable or declined after an initial improvement whereas the performance of staff that role-played continued to improve. Moore (2005) reminds that teachers often use role-playing to facilitate learner involvement and interaction in the process of decision making. Svinicki and McKeachie (2011) see the chief advantage of role-playing to be that students are active participants rather than passive observers and therefore must make decisions, solve problems and react to the results of their decisions. Dell'Olio and Donk (2007) believe that role-playing helps students make responsible autonomous choices because it provides a forum for exploring multiple ways of acting and reacting in a given situation. Hall, Quinn, and Gollnick (2008) state that experiences gained through role-play can take the place of firsthand experiences that may be impossible to otherwise achieve, and further explain that teacher-education candidates often cite such experiences as the most informative and influential part of their teacher-education coursework. Randel et al. (1992) found that students reported more interest in role-playing when compared to traditional methods of teaching. A concern, however, regarding the use of role-play is raised by Shepard (2002) who describes the anxiety often experienced by students who have not previously role-played before, particularly since they would be required to do it in front of their classmates. Henriksen (2004) too expresses concerns that not only might students be anxious but also that they may think that role-play is associated with a childish image. For their part, teachers are attracted to role-play, particularly if their theoretical orientation is constructivism, allowing

to learn by making connections between their own knowledge and experience and the real world (Kindsvatter, Wilen, and Ishler, 1996).

2. CONSTRUCTIVISM AND THE NATURE OF THE LEARNING PROCESS

As used in this study, the nature of the learning process is that it is an intentional process on the part of the learner of constructing meaning from information and experience. Academic role-playing is an example of the use of constructivism and student-centered learning wherein students are enabled to create their own meaning from participating in realistic life situations. According to Lainema (2009), constructivism has recently gained popularity again although it is certainly not new, but even today it is difficult to define it unambiguously. Building on the ideas of Dewey (1910), Piaget (1970, 1972), Vygotsky (1978), constructivism can be defined in a variety of ways with differing areas of focus. Kauchak and Eggen (2007) define it as an "eclectic view of learning that emphasizes four key components: (1) learners construct their own understandings rather than having them delivered or transmitted to them; (2) new learning depends on prior understanding and knowledge; (3) learning is enhanced by social interaction; and (4) authentic learning tasks promote meaningful learning" (p. 9). Ormrod (2000) says that while there may be no single constructivist theory, most adherents recommend these same five beliefs: complex, challenging learning environments and authentic tasks; social negotiation and shared responsibility as a part of learning; multiple representations of content; understanding that knowledge is constructed; and student-centered instruction. Lainema (2009) agrees that constructivism has been described by some as more a set of principles than a coherent theory and that all advocates do not necessarily share the same view of these principles. Marlowe and Page (2005) contrast constructivism with the more traditional lecture approach in four ways: constructivist learning is about constructing knowledge, not receiving it; constructivist learning is about understanding and applying, not recall; constructivist learning is about thinking and analyzing, not accumulating and memorizing; and constructivist learning is about being active, not passive. Most constructivists agree that constructivism focuses on what students do and experience, and learners are therefore encouraged to take control of and become increasingly responsible for their own learning.

Building then on the theory of constructivism, we further define learning as the intentional, meaningful,

coherent representation of knowledge. It occurs best when learners are goal-directed, and it is successful when they can link new information with existing knowledge in meaningful ways. It can be enhanced when learners have the opportunity to interact and collaborate with others (American Psychological Association, 1997). Role-play as an instructional strategy takes advantage of these practices – connecting new experiences to previous knowledge and experience, and doing it in the company of others. According to Gunter, Estes, and Schwab (2002), the only thing that really matters to learners is the meaning students construct for themselves. Lainema (2009) defines learning as an active process of constructing rather than communicating knowledge. It also is best when learners experience insight which is defined by Bigge and Shermis (2004) as getting the feel of, or catching on to a situation. All of these conditions are further enhanced when students feel psychologically safe (Rogers, 1969). Overall, learning should involve purpose and movement toward a goal. To design curriculum so that this type of experience occurs for students, professors should design active, learner-centered strategies that ideally start with relevant problems that students are motivated to resolve and apply to their own lives. In our opinion, role-playing satisfies these criteria. In our use of role-playing to prepare students to become effective teacher/coaches, we defined our roles as facilitators and discussion leaders.

3. METHODS

3.1 Participants of the Study

Participants of the study were undergraduate physical education seniors from a large diverse urban American research university who were taking a capstone secondary teaching methods course with a sustained service-learning component (i.e., coaching an after school soccer program). The course was specifically designed to prepare pre-service teachers to become physical education teachers and coaches in the public schools. Those taking the course in the fall of 2010 and spring of 2011 were in a control group (N=50), and the other students who took the course in the fall of 2011 and spring of 2012 participated in the role-play intervention (N=52). A subset of 24 of the 52 intervention group students (13 males and 11 females) participated in the specific role-play activities and responded to both of the two questionnaires administered in this study. The two investigators were professors in the same College of Education and Health Professions (one from a Department of Curriculum and Instruction, and the other from a Department of Kinesiology). An

internal review board for research approved protocols for this study.

3.2 Role-Play Activities (The Intervention)

The role-playing model used in the study is by George and Fannie Shaftel and consists of nine steps: (1) warm up the group, (2) select participants, (3) set the stage, (4) prepare the observers, (5) enact, (6) discuss and evaluate, (7) reenact, (8) discuss and evaluate, and (9) share experiences and generalize (Shaftel and Shaftel, 1967). The intent of the Shaftel model, and of the investigators' several variations of it, was to teach problem-solving attitudes and skills such as the ability to identify a problem, to design a plan to resolve it along with alternative techniques, and to experience the consequences of a variety of different ways to handle problem situations. No game-like elements or rewards were added to the role-playing used in this study.

A unique educational advantage of the Shaftel model is their fourth stage – preparing the observers. By assigning students who are not actually playing one of the roles to specifically observe one of the players, all members of the class become directly involved in the process. Then, during the sixth stage - discuss and evaluate - non-participating students are asked to report out on their reaction to the role that was played: was it realistic, was it successful, what values were being upheld by the players, is there another way the role could be played to reach the same conclusion or a different conclusion? In large university classes, students are more likely to become and remain engaged in the role-play if they have been given a direct assignment to observe and critique one particular player than if they are simply present in the room when other students are role-playing.

In therapeutic settings, when role-play is used, participants are encouraged to focus on feelings, and that type of role-playing known as psychodrama or sociodrama is therefore designed to allow for feelings to be expressed along with insight into one's own behavior and that of others. On the other hand, in the educational setting, the Shaftel model emphasizes the intellectual content as much as the emotional content, and the analysis and discussion that follow the enactment are as important as the role-play itself (Joyce and Weil, 1980). In the role-plays in the current study, students were encouraged to do both – to acknowledge their feelings and to address the cognitive course content being tapped by the vignette. Further they were asked to look for the assumptions which underlie people's verbalizations and behavior. As the post-role-play discussions

continued, students were also asked to identify the values that were being expressed. The Shafteel model is designed to deemphasize the traditional role of the professor and instead for the professor to listen and learn from the group. When the learner has an opportunity to interact and to collaborate with others on instructional tasks, learning is enhanced (American Psychological Association, 1997). A final goal of the Shafteel model and of this research was therefore to allow students the opportunity to bring to their conscious awareness their own values while testing them against the views of others. In teacher education this is of significant importance as instructors try to move students to where they may either validate their current values or to revise them as they learn from other positions and value systems.

An original vignette or written scenario was provided to the students on an overhead projector, and students were instructed to determine what they thought the "intended outcome" or solution to the problem should be. They were then instructed to plan techniques or dialogue they would use to accomplish their "intended outcome". While the students were writing their plans, a table and chairs were placed in front of the classroom. At that point students volunteered (and in some cases were selected) to role-play the parts in the vignette. After the role-play was concluded, the investigators and the other class members provided feedback and reactions. Additional role-plays were then conducted using the same vignette to give other students the opportunity to try out their own implementation ideas and interaction styles.

Variations or adaptations that were added to the Shafteel model for this study included having the students plan in advance and to write out how they would act out their roles, focusing on their designation of an "intended outcome." A second variation allowed the student portraying the coach/physical education teacher to pick a "back-up" to sit behind him/her during the role-play to serve as a helper (to make helpful suggestions from the sidelines) if he/she hit an impasse with the person playing the other character in the vignette. A final very popular variation called for all the students in pairs to do practice role-plays at their seats (to try out their ideas and plans) before volunteering to role-play in front of the class. Each of these variations was used with some of the vignettes, but not with all of the vignettes.

3.3 The Vignettes Used for Role-Plays

According to Schick (2008), role-play participants are more likely to give full effort and to be accomplish

the tasks and thereby acquire the skills being taught when a role-play is about something that they find personally meaningful. The five original vignettes used for the role-plays were composed because the content was deemed to be personally meaningful to this group of students. The following issues that students might reasonably encounter both in their service-learning activity and as beginning teacher/coaches were: public school students not motivated to participate; aggressive students who are hurting other students; sexual harassment toward the teacher/coach; challenging the teacher/coach's authority; and establishing a working relationship with a senior coach who is not interested in the school's physical education program. In all of the vignettes except the one with the senior coach, all roles were played by members of the class. In the vignette about the senior coach, one of the investigators played the role of the coach. When the investigator was role-playing, the students loved getting a chance to "outsmart" their professor. One of the most interesting responses that occurred after each of the post-role-play discussions was completed was that students volunteered other similar situations that they would also like to role-play. After the role-play on sexual harassment by a male student toward the young female teacher/coach, for example, students suggested they role-play sexual harassment toward a male from a female student and also same-sex harassment for both genders. Like the pre-service students described by Sobel and Taylor (2005), our students too requested more real-world scenarios to solve.

This is the vignette used for the too-aggressive student:

Fifth period rolls around and this time the juniors and seniors enter the gym for a class called "team sports." They tell you they have been playing a flag football unit and a few students go into the closet and pull out the necessary equipment. A senior named Dominick divides up teams and runs the class very efficiently leaving you very little time and opportunity to manage and/or control anything. The game begins and Dominick exhibits extremely aggressive behavior toward the opposing team – hitting students hard and tripping and tackling them to the ground violently. He is also abusive to his own teammates, yelling at them when they make mistakes and blaming them for anything that goes wrong on their team. It is obvious the students are afraid of him and will do anything to try and just appease him and/or stay out of the way.

You ask Dominick to speak with you in the office. What is your next move?

3.4 Sources of Data: Quantitative

Two sources of quantitative data were used for analysis in this study. The first utilized a 14-item Likert-scale questionnaire developed by the provost's office regarding course effectiveness and class interaction in a university course. This instrument was administered three times at even intervals to pre-service teachers throughout each of the control and role-play semesters. Based on relevance to this study, only six of the original 14 questions were retained for analyses. Because data was collected on participants in this course the academic year previous to when the role-play interventions were conducted, a quasi-experimental non-equivalent groups design was applied to this dataset using a paired samples T-test analysis. This test compares the means of two variables, computes the difference between the two variables for each case, and tests to see if the average differences are significantly different at the $p < .05$ level. The second set of quantitative data was collected from a summative and descriptive questionnaire specifically addressing the usefulness of the role-play activities in the course and comparing it to traditional lecture-style methods. This questionnaire was only administered to the pre-service teachers who participated in the role-play activities during the very last semester of the intervention (i.e., intervention group-spring 2012 [N=24]).

3.5 Sources of Data: Qualitative

Using a naturalistic approach (Lincoln and Guba, 1985), qualitative data was collected in the form of a role-play questionnaire, a student focus group, and individual reflections written by the instructors. This data was recorded, transcribed, and analyzed, noting all salient and recurring units of meaning that were reported. These themes not only helped explain and clarify the quantitative findings, but they also served to address some of the quantitative limitations and provided a more complete and in-depth description of phenomena happening within the study.

4. RESULTS AND DISCUSSION

4.1 Course Effectiveness Questionnaire

Findings from the course effectiveness questionnaire showed significantly higher scores reported among pre-service teachers who participated in the role-play activities on two of the six items (Figure 1). The first item, "The instructor asked students in class to participate in a discussion of the topic at hand?"

exhibits how using role-play in a course can force the instructor to engage students with the content at hand and create more of a student-centered teaching and learning environment. The second item, "The student asked or responded to a question from the instructor or fellow students?" demonstrates and supports what others have found in the literature about the level of participant engagement required of role-play activities and the effect it can have on participants.

4.2 Role-Play Questionnaire

Responses to the five descriptive questions on the summative role-play questionnaire were as follows:

Q1) Have you had previous participation in role-play activities?

No: 17

Yes: 7

Note: The 7 students who said they had previously participated in role-play activities stated that they had all experienced role-play in their university teacher education courses except for one student who said she had experienced role-play in a high school theatre arts course.

Q2) Describe your reaction to the use of role-play as preparation for your service learning as well as for your first teaching job:

Very helpful: 24

Not helpful: 0

Q3) Comparing role-play to the traditional university lecture method, which do you prefer?

Prefer traditional lecture method: 0

Prefer role-play scenarios: 22

Likes both equally: 2

Q4) Describe your learning engagement level during role-plays compared to lecture style:

More engaged during role-play – 21

Mentally engaged but did not volunteer to role-play in front of the class – 3

Note: One of these three students explained: "There were sometimes where I could have participated, but opted not to. In my mind I was engaged with classmates during their individual role-plays." It became obvious to the researchers that these three

students had misunderstood the use of the term “engaged” as used in this role-play questionnaire.

Q5) Regarding your critical thinking ability, compare the two styles:

More engaged in critical thinking during role-play – 23

More engaged in critical thinking during lecture – 1

Note: This second student’s explanation was “Because everyone was thinking at one time, I didn’t have to.” But further in the questionnaire, he wrote: “I’m a hands-on learner, and the role-playing scenarios actually put me in the situation instead of just reading about it in a book.”

Other specific comments on the questionnaire included:

“Role-play gets you closer to the real deal rather than listening to someone just tell you how to react. It was never boring; I was always eager to see how different people would respond. I looked forward to seeing all the different techniques. I feel like it forces you to respond quickly while thinking critically as opposed to lecture where people can just act like they are paying attention.”

“I had to pay attention because I didn’t have the situations in a book to read later.”

“Being able to reflect back on these role-plays and notes I took will help me handle that situation better than I would if I had no prior experiences.”

“They help me figure out the “goal” because we may not have really known it before then. I need to focus on the goal and not allow my emotions to overtake the goal.” (Note: The comment by this student refers to their instructions to write out the intended goal before attempting the role play).

“Role-Play gives me a lot better idea of “real world” situations and it has put more tools in my bag.”

“Only when you find yourself in a problem situation do you learn the feelings, obstacles, etc. as if you really would in the real world. It really doesn’t help me personally to be told how to handle a situation. It is easier to learn through DOING.”

“The biggest benefit was that I was able to hear how others would respond to specific situations. As I watched others participate, I was able to place myself in the situation and think more critically about my answers.”

Overall, their answers on the questionnaires revealed that learning from one’s peers, trying out ideas in a safe environment, being forced to plan an intended outcome in advance, and hearing feedback from others were their most valued experiences.

4.3 The Focus Group

Discussions that emerged from the focus group included themes relevant to situations likely to occur while working in a secondary public school setting (e.g., planning for success, confidence building, effective communication, and utility of process). All comments were in one way or another reflections about the authenticity of training for life in schools despite the fact that it was not literally “on the job” training. Finding one’s style or strategy for dealing with the challenges and realities of the profession was explicit, as it was noted time and again that this learning strategy was effective at bringing out individual strengths and weaknesses when it came to dealing with common situations educators are faced with every day. As a result, the role-play experience provided an initial or baseline realization about how pre-service teachers are likely to respond on the job, allowing for deep-seated reflection and self-analysis of how to handle similar situations that are just around the corner in their service-learning projects and/or student teaching residency.

The other part of the focus group discussion reflected some of the benefits of going through an authentic and mentored kind of learning exercise without being tied to a “real” situation with direct consequences. Not too often are novice teachers allowed a trial “run-through” that encourages mistakes to be made without any real consequences to students. This includes the affordability role-play allows to take a time-out, consider multiple angles and solutions, and re-think how to approach a particular situation. These exercises allowed for extra time and space for questions, new ideas, elaborations, and redirection of an experience in order to gain depth and understanding of the appropriate (and inappropriate) ways to approach or handle teaching interactions and learning situations. This is critically important since we know that a teacher’s word choice, body language, and personal disposition represents everything meaningful when working with students.

It was also discussed that this platform makes it possible to learn from multiple people with diverse experiences (not just the professor), and to gain a multi-dimensional perspective about how to deal with the problem effectively and in different contexts. Finally, there was consensus among participants that the role-play strategy helped

Figure 1: Paired Samples Tests of Course Effectiveness Survey Items

	<i>Mean Difference</i>	<i>Std.</i>	<i>t</i>	<i>Sig. (2-tailed)</i>
	<i>(Control-Experiment)</i>	<i>Deviation</i>		
1. Instructor asked students to participate in a discussion of the topic at hand.	-0.12	.59	-2.115	.037*
2. Instructor allowed students to interact, compare notes, work in groups, etc.	-0.06	.51	-1.337	.183
3. Instructor called for students to provide feedback on what is happening in the class.	-0.04	.57	-.744	.458
4. Students worked together with other students.	-0.03	.66	-.515	.607
5. Students helped a fellow student better learn a concept.	0.04	1.19	.355	.723
6. Students asked or responded to a question from the instructor or fellow students.	-0.19	1.06	-2.080	.039*

* Significant at the $p < .05$ level

pre-professionals better foresee challenges and to take the necessary time (or buy time) to prepare for precarious situations that are likely to occur at some point in their career. In effect, the role-play activities enabled teacher candidates to be on the lookout for conflict or divergence, to be proactive rather than reactive, and to know how to best take advantage of an opportunity when presented.

4.4 Investigators' Observations

Much to the credit of teacher education research over the past few decades, literature has repeatedly pointed to experiential training as an effective means for preparing student teachers for their work in education (Coffee, 2010; Domangue and Carson, 2008; Wasserman, 2009). This work has largely focused on the implementation of theoretical and content knowledge mixed with practical field experience provisions (e.g., service-learning), beyond mere lecture and examination of generalized course material. Although this push has enhanced teacher education methodology to include practical experience and guided reflection with experienced mentorship, service-learning in itself still has its limitations. Foremost, service-learning is affecting

learners in real-time and you do not get "do-overs." You can't just call "time-out" and reexamine how you would handle a situation or take a moment to analyze all the variables that go into split-second decision-making when working with large groups of students; you are still teaching in real-time. By adding in a third component like role-play into this teacher training trifecta, teacher educators have another tool to prepare for likely situations by evaluating, analyzing, and redirecting a preparatory experience before the actual service-learning experience takes place. In determining whether learning did or did not take place, we agree with Jonnassen, Peck, and Wilson (1999) that assessment of this type of activity is process-oriented, and one of the most valid forms of assessment is therefore to assess while the learning is occurring.

5. CONCLUSION

Every secondary level teacher knows that working with teenage students is not always an easy job. Every day there is a new challenge that educators must face, and it takes time and experience to learn how to handle situations appropriately with this population. Gaining real-world experience in a university

setting is oftentimes difficult because access to schools and students is also never easy or convenient. Using role-play techniques to guide future educators for those likely difficult encounters is an effective way to construct a platform for the exploration of issues, provide practical mentorship, and inspire reflection about best practices. This study has shown that academic role-play in a teacher education course with a service-learning component can improve course interaction between instructors and students and also between students and students, therefore strengthening the active-learning dynamic in a university classroom. With regard to the specific questions addressed in this research, we conclude that the use of the adapted version of Shaftel's role-play model did (1) increase students' classroom interactions with peers and with the instructors; (2) did increase students' positive responses to course content, especially as compared to the same content taught without the use of role-play; and (3) did increase students' confidence toward their ability to succeed in the service learning activity as well as in their student teaching. Future research, however, is needed to explore whether and to what extent student background variables such as age, gender, performance anxiety level, and previous academic as well as non-academic role-playing experience would make a difference in students' reactions and responses. Since this research utilized an adapted version of the Shaftel role-play model, results may have been different if only the original nine-step Shaftel model had been used. It would also be interesting to determine if the students would have responded in the same way if they were only going to become future teacher/coaches but were not also preparing to do a service-learning project that would affect their course grades. Because this study did not control for those variables, and because of the small N, generalizing regarding the use of role-play with all teacher education students studying to become coaches and physical education teachers while enrolled in service-learning courses should be made with caution.

Notes. 1. To prepare future teachers for their student teaching/practicum/residency semester required by most states in America, teacher educators often require students to role-play a teacher in a micro teach format within which they teach a lesson to a simulated class of students.

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Ecological Approach to the Performance of Larping

Popular abstract: This paper introduces an ecological approach to the performance of live action role-playing, commonly referred to as larping. Ecology and ecological, in this context, are not used to explain our relation to nature and its protection, but rather our relationship to our surrounding environment and other subjects dwelling in it. The approach was chosen because it provides the study with a comprehensive and an inclusive way of looking at performances.

Larps can be seen as performances from many points of view: it can mean displaying one's skills in role-playing or in improvising; it can mean patterning one's behavior to signify that of a fictional character; or it can mean keeping up a vision or expectations of a fictional character. In addition – and what is especially the focus of this paper – the performance of larping can be understood as completing or carrying out actions that constitute the activity called larping.

To explain the ecological approach, this paper will first provide the reader with an overview of larps as ecologies, and then dissect the performance of larping into four steps that are essentially connected to each other in the ecology: information pickup, extraction of possibilities, choice-making and embodiment. To summarize, a larp ecology is a comprehensive interdependent systems where all the players and other organic and non-organic components of the game support each other. In this ecology, the players pick up information, extract possibilities for actions from that information, make choices on which possibilities to carry out and embody those choices by applying their bodily repertoire to the performance.

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1. INTRODUCTION

This paper introduces an ecological approach to the performance of larping. It is inspired by James J. Gibson's (1986) *The Ecological Approach to Visual Perception*, in which he defined perception as an ecological, reciprocal relationship between us and the environment. Respectively, larping can be seen as an ecological, reciprocal relationship between the participants and the environment of the event, i.e. the players and the game. According to Gibson (*ibid.*, p.7), environment means "the surroundings of those organisms that perceive and behave." Because the behavioral capacity of such organisms, i.e. humans and animals, is a crucial point to Gibson's approach, it is only natural to draw connections from his work to *performance*.

In this paper, the word *performance* is understood to have many meanings. Victor Turner (1982, p.13), for instance, explains that its etymology derives from Old French *parfournir* which means "to complete" or "to carry out thoroughly." In this sense, larps as performances could be described as events that the players complete or carry out thoroughly. Marvin Carlson (2004), on the other hand, divides the meaning of performance into three separate aspects: the display of skills; patterned behavior; and keeping up the standard. All of these aspects of performing can be found in larping: it can mean, for example, displaying one's skills in role-playing or in improvising; it can mean patterning one's behavior to signify that of a fictional character; or it can mean

keeping up a vision or expectations of a fictional character. In this paper, *the performance of larping* is understood especially through Turner's definition: as completing or carrying out actions that constitute the activity called larping.

Although some studies on role-playing games and performance have been conducted before, most of the theories applied in this paper stem from other fields of study and their relevance to larping is based on my own analysis and interpretation of the phenomena. To briefly summarize a few of the previous studies on role-playing and performance, Daniel Mackay (2001, p.53), for instance, has defined the performance of role-playing games as "the set of events available to the players themselves and the gamemaster, which includes all of the characters' interactions . . . in addition to out-of-character remarks and events." J. Tuomas Harviainen (2008) has approached role-playing as performance art by comparing larps with Situations and Happenings. For Harviainen, larps are the evident "heir" and "fulfillment" of the performance artist Allan Kaprow's ideals because they realize certain demands of performance art such as blurring the line between art and life, breaking the limitations of time and space, and eliminating the audience from the performance. Jaakko Stenros (2010, p.313) has suggested that larps are "like improvisational theatre without an audience that is (not) performed for its own sake, rather than performed for an audience." Eleni Timplalexi (2011), on the other hand, has explained that larping is a process in which the players mediate imagined,

iconic fiction through the performative.¹

I have previously discussed that, especially in the context of *Nordic Larp Tradition* (see Stenros and Montola, 2010), larping could be seen as *transportative performative behavior*, in which the players pattern their behavior to signify that of their characters for the duration of the game (Lampo, 2011). To build on this notion, this paper will take a closer look at what it is that players do in the performance of larping and suggest an ecological approach by dissecting aspects of the performance into four interconnected steps: information pickup, extraction of possibilities, choice-making and embodiment.

2. LARP ECOLOGIES

Larps can be seen as *ecologies* and the performance of larping as *cultural improvisation*, the dramaturgical nature of which could be regarded as a *texture* that can be examined in the form of *scenarios*.

The conception of larps as ecologies is based on interdependence: we are connected to our environment and vice versa. Gibson (1986, p.8) explains that no animal or human could exist without an environment and an environment implies an animal or a human to be surrounded. It is a reciprocal relationship that binds our perception not only to the domain of the mind but also to the body. Unlike the Cartesian mind/body split, that has been the dominant assumption of Western science and humanities for centuries, the ecological approach suggests that we are complex living organisms with a body that is constantly interactive with our physical and social environment (Gibson, 1986; Damasio, 2006; McConachie and Hart, 2006; see also Lieberoth, 2007; Lankoski and Järvelä, 2012).

Exploring larping through an ecological approach entails the whole ecology of the performance. In his *Theatre Ecology*, Baz Kershaw (2007, pp.15-16) applies the concept of ecology to theatre and performance by suggesting that:

‘Theatre ecology’ (or ‘performance ecology’) refers to the interrelationships of all the factors of particular theatrical (or performance) systems, including their organic and non-organic components and ranging from the smallest and/or simplest to the greatest or/and most complex.

He also specifies that everything in this ecology is interdependent – clear distinctions between organisms and environments are not always easily

¹ See also e.g. Snow, 1993; Choy, 2004; Fatland, 2005; 2006; Phillips, 2006; Flood, 2006; Morton, 2007; Harviainen, 2010; MacDonald, 2010; Zimna, 2010; Montola, 2012; Stenros, 2013.

made. Adapting Kershaw’s take on theatre ecologies, a *larp ecology* would then mean a comprehensive interdependent system where all the players and other organic and non-organic components of the game support each other. Because of this interdependency, the actions of one player are dependent on the actions of other players (Hansen, 2003; Montola, 2004) – even to the end where a decision not to act, or to act in isolation from the others, automatically affects everyone else and everything else.

2.1 Cultural Improvisation and the Formation of Textures

Larp ecologies are based on improvisation. The players do not have predetermined scripts that tell them what to say or do during a game. It might be tempting to understand such behavior as theatrical improvisation. The connections between larping and theatre have been widely theorized (e.g. Choy, 2004; Flood, 2006; Phillips, 2006; Morton, 2007; Stenros, 2010; Timplallexi, 2011), but as the inherent perceptual, architectural and dramaturgical differences between the two are so prominent, it might be reasonable to steer the discussion on larping away from theatre rather than towards it (Lampo, 2011). Therefore, in this paper I work with the notion that larping is a form of *cultural improvisation* (Ingold and Hallam, 2007) that operates through its own cultural logic and guidelines.¹ I am applying this concept for the performance of larping because it helps in depicting certain features of the activity that are essential for understanding it as an ecology.

First of all, in cultural improvisation like larping the individual performances – the “carrying outs” – of each participant *weave* together the whole of the ecology. Applying Tim Ingold’s concepts of *weaving* and *texture*, Teemu Paavolainen (2012, p.36, italics in original) has suggested that “emergent or generative” dramaturgies have “more to do with *texture* than with precomposed *structure*, with *weaving* rather than *making*”. Since the dramaturgy of larping could be regarded as emergent and generative, texture and weaving have much to do with larp ecologies as well. In a way, larping is like weaving and the events that emerge from that weaving are like a texture of a sort.

Understanding cultural improvisation as weaving is based on Ingold’s (2007) notion that living one’s life can be regarded as a line. According to him, we live lives “along paths, not just in places, and paths are lines of a sort” (ibid., p.2). As these “lifelines” meet

¹ Theatrical improvisation can also be regarded as a form of cultural improvisation that is characterized by its own logic and guidelines. However, as the focus of this article is solely on larping, I have chosen to steer the discussion away from theatre.

and get entangled with each other, a texture, “a meshwork of entangled lines”, emerges (ibid., pp.80-82). Thus, as the players of a larp could be considered to “live the lives” of their characters for the duration of the game, the performances of the players could be considered to weave together their individual paths and form a specific kind of texture that embodies all the events, feelings and experiences of that specific larp ecology.

Secondly, the formation of the texture in cultural improvisation like larping is both emergent and generative. Emergence, for Paavolainen, relates to Chris Salter’s (2010 cited in Paavolainen, 2012, p. 32) notion of how “the world emerges over time, continually transformed through our history of interactions with it”. In larps, the actions players perform emerge in the moment as results of the players’ interactions with the environment of the game (see also Montola, 2012, pp. 75-77). I would add that emergence, in this sense, is relational, which, to Ingold and Hallam (2007), is a key element of cultural improvisation. “Improvisation is relational,” they explain, “because it goes on along ‘ways of life’ that are as entangled and mutually responsive as are the paths of pedestrians on the street” (ibid., p.7).

Thus, the performances the players carry out in larp ecologies are continually influenced by other players and the environment of the game, and simultaneously these surroundings are transformed by the players’ interaction with them. For example, if a group of orcs begins a fight with a group of elves in a Tolkienesque fantasy larp, the actions the players improvise emerge as responses to what sort of actions the other players perform. A strike of an elf warrior’s foam sword might get blocked by an orcish boffer shield but at the same time the orc carrying that shield might get stabbed in the back with a foam dagger by another elf. While concentrating on this hit, the back-stabbing elf might have missed a raging orc rushing towards him and right when he stabs the shield-carrying orc, the other orc hits the elf with a massive boffer hammer.

Just as the interweaving of textures in larp ecologies is emergent, it is also generative. To paraphrase Ingold and Hallam (2007, p.1), improvisation is generative because it gives rise to forms of culture as we experience them. Although such performance theorists, as Richard Schechner and Diana Taylor, have argued that performance is “never for the first time” (Taylor, 2003, p.28) and that it is “restored” or “twice-behaved” (Schechner, 2006, p.28), Ingold and Hallam (2007, p.6) point out that such “meme-juggling” is not what cultural improvisation is essentially about. “To recover this generative dynamic,”

Ingold (2011, p.7) has explained in a later work, “creativity must be read ‘forwards’, in the movements that give rise to things, rather than backwards from their outcomes”. Hence, the player performance in a larp ecology is – reading backwards – like restored behavior that reveals our cultural traditions, and at the same time – reading forwards – always for the first time. For example, in a larp with a medieval theme, if a player of a servant greets the player of a king by bowing in front of him, the player performs a culturally traditional act that show respect for a high authority and that has been performed repeatedly in the history of mankind. At the same time, however, the player performs an act that no-one has performed in that specific place, in that specific moment, in that specific situation before.

In a sense, larping seems to operate through a desire to simulate life.¹ Therefore, examining the performance of larping as a cultural improvisation in the above manner might raise a question: how does this approach differ from everyday life? The answer is: in a sense, it barely does. If larping simulates life, we need a way to understand the performance of larping *as if* it was life. The difference between larping and everyday living (working, studying, cooking, cleaning, etc.), however, is that during a larp the players are portraying specific (fictional) characters instead of their everyday social roles (see Lukka, 2011), the games are framed in a specific manner (Bateson, 1973; Goffman, 1974), and the events that emerge during larps tend to follow sets of guidelines and objectives that the players have agreed to respect for the duration of the game (Costikyan, 2002; Montola, 2009).

2.2 The Texture of Larp Ecologies as Scenarios

Since larping is a live cultural improvisation, the texture of its ecology is not predetermined, nor does it sustain. As soon as the game is over, it disappears. Attempts to record, document, and describe the performance inevitably alter the event itself (Phelan, 1993). Even if some kind of descriptions or narratives were created of the experiences, as the players often do (Heliö, 2004; Harviainen, 2012, pp.46-49), it is not the same as the live performance itself. The relics of the “backwards” can never restore the novelty of the “forwards.” In addition to their ephemeral nature, according to Jaakko Stenros and Markus Montola (2011, p.4), documenting larps is challenging because they are also subjective, co-creative and aimed at a first person audience.

¹ Jane McGonigal (2003) has suggested that games may have an unfulfilled desire to be transformed into real life. She calls this the “Pinocchio Effect.”

What then can be done to grasp even just a hint of this meshwork of entangled performances that larping is? Diana Taylor (2003) proposes *scenarios* as the meaning-making paradigm for performances instead of the traditional corner stones of Western epistemology, i.e. text and narratives. She explains that a scenario means “a sketch or outline of the plot of a play, giving particulars of the scenes, situations etc.” (ibid., p.28). In addition to plots and narratives, a scenario reveals such features of performance that are not reducible to language, for example milieu and corporeal behaviour like gestures, tones and attitudes. In larps, a scenario can be a small instance of player interaction, such as a simple gesture and its response from a co-player, but it can also be a larger instance, such as a discussion between some characters at a specific moment in the game, or a certain relationship between two or more characters that gets manifested throughout the event.

An example of a small scenario would be two characters greeting each other. What do they say? Do they shake hands, bow, curtsy or perhaps nod? How do they position their bodies towards each other? Do they show specific facial expressions? Do they use a specific tone of voice when speaking? All of these details are part of the scenario. In a larger scenario, where, for example, three characters are mixed up in a difficult love triangle and spend the whole game solving the mess, detailing gets more complicated and challenging. How did the characters end up in such a situation? What did the players do in order to hide or reveal it? What did they do when the situation was uncovered? What sort of gestures, postures and tones of voices were used when dealing with it? Were, for example, certain gestures repeatedly used in the scenario?

A scenario is simultaneously its setup and actions. The former lays out all the possibilities of the scenario and the latter embodies the traditions, values, goals, power relations and other features emerging from the setup (ibid. pp.28-29). Although there can be multiple reasons for why certain actions emerge from certain setups, larps as a form of cultural improvisation could be seen to have a few features that guide the player behavior to a certain kind of performance. Larps, like other role-playing games, can have some implicitly emerging goals (Costikyan, 2002) and some “invisible” rules (Montola, 2009). The players could, for instance, try to improve their characters’ social status and knowledge during the game, and usually the players are required to follow and respect the framework of the

fiction² (see also Stenros, 2010). In this sense, to larp is not the same as to live ones everyday life: larping is framed and structured in a specific manner by its rules and goals.

Because the texture of larp ecologies could be understood as interconnected scenarios that reveal the player performances in a specific way, it is important to point out that, if the player performances are understood as lines, then scenarios must be understood as knots formed by these lines. Ingold (2007, p.100, italics in original) explains the concept of knots by comparing them to his concept of hubs:

[H]ub, as a container for life, is clearly distinguished from the individuals it contains – each represented by a mobile dot – as well as from the lines connecting it to other hubs in the network. The knot, by contrast, does not contain life, but is rather formed of the very lines along which life is lived. These lines are bound together *in* the knot, but they are not bound *by* it. To the contrary they trail beyond it, only to become caught up with other lines in other knots.

To examine a scenario in a larp ecology, is to examine as much of the interwoven knots of player performances as possible (or necessary). It may not be easy to understand why certain events emerge from certain game setups because the trails of those events may lead all the way to the very beginning of the game – and even beyond, to the players’ private lives outside the game (see e.g., Bowman, 2013). Thus, although scenarios might reveal us something about the repertoire of embodied human tradition that is inherently lost in the archival knowledge (Taylor, 2003), I would still argue that the scenario is always “unhappy.” It can never fully unfold everything what has been tied together in a live performance.

3. THE STEPS OF THE PERFORMANCE OF LARPING

To comprehend my ecological approach to the performance of larping, the aspects of this performance could be dissected into four steps: picking up information from the larp environment; extracting possibilities from that information; choosing which possibilities to carry out; and embodying them into actions. Making such a cut helps in grasping the idea of the approach. However,

²In game studies *fiction*, *fictional* and *fictive* have been commonly referred to as *diegesis* and *diegetic*. This approach is, nevertheless, problematic, especially in relation to role-playing games, because it connects games to narratology, which, as a basis for terminology, can be rather constrictive (Frasca, 1999; Timplallexi, 2011).

dissected in real-life human behavior. The transition from one to another may not occur chronologically and the steps might even overlap. The players may not be aware of such processes – and they do not even have to. Nevertheless, in this paper they will be discussed in the order suggested above to keep the phases of the process comprehensible.

3.1 Information Pickup

An essential part of the player performance in larps is picking up information from the larp ecology. According to Gibson, his concept of information pickup differs radically from the traditional theories of perception because he neglects the conception of information as “knowledge communicated to a receiver”. He explains that gestures, words, pictures and writings communicate information but the information in “the sea of energy around each of us” does not. Information is not something that needs to be communicated – it is simply there to be picked up. (1986, p.242)

During a larp, the players pick up information in order to find out what to do or where to go. Harviainen (2012b, p.91) suggests that the players usually resort to a technique called *berrypicking*, meaning that they pick up “bits and pieces of conveniently available information from various sources.” *Berrypicking* is similar to *cherrypicking*, in which the players pick up only the best parts of the available information. The former, however, is apparently a preferred practice, as it does not disturb “the illusory reality” or “the magic circle” the game (Harviainen, 2012a; 2012b).

In larp ecologies, there are multiple kinds of information to be picked up: “diegetic,” “extradiegetic,” and/or “pre-game information” (Harviainen, 2007). Diegetic (or fictional) information is everything that is available for the characters in the “gaming world frame” (Fine, 1983), and extradiegetic (or extrafictional) information is what exists outside that frame. Pre-game information, on the other hand, is everything that the players have been provided with before the game, e.g. setting material, character material, genre information and game mechanics (Harviainen, 2007). The players tend to have different practices in how to treat the information they pick up, for example whether to use “extradiegetic” information during the game or to try to ignore it (Harviainen, 2006). Whatever the preferred practice, one thing is common to all players: none of them know what will happen next and what sort of information they will be able to pick up in the course of the game.

The players do not have prewritten scripts or maps to help them navigate through the game. Although they might be able to anticipate some events to take place based on, for example, the incentives placed in the pre-game information material (Fatland, 2005), or such *fabula*³ that emerge during the event (Harviainen, 2007), the final texture of the game is usually unknown even for the game’s organizer, i.e. the gamemasters. Therefore, the way the players pick up information and interweave the texture of the larp ecology, is comparable to what Tim Ingold (2000) calls *dwelling*.

Dwelling, as a concept, derives from Martin Heidegger’s essay *Building Dwelling Thinking* (1971) in which he explores the meaning of dwelling in relation to building. Heidegger suggests that “we do not dwell because we have built, but we build and have built because we dwell, that is, because we are dwellers” (1971, cited in Ingold, 2000, p.186). Ingold (ibid.) explains that people do not build houses (or other constructions) based on innate or pre-existing ideas but as a result of “the specific relational contexts of their practical engagement with their surroundings.” In larping, this would mean that players do not perform their characters (solely) based on pre-given information but rather their performances, the textures of the larp ecology, emerge as they dwell in the larp environment picking up “the berries of information” and weaving their characters’ lifelines together in relation to that information.

3.2 Extraction of Possibilities

As the players dwell in the larp environment picking up information, they distinguish or *differentiate* (Gibson and Pick, 2000) between different substances in their surroundings and extract possibilities for action, or, in other words, *affordances*. *Affordance* is a term created by Gibson (1986, p.127) to depict what the environment offers or provides us. We perceive different affordances in the environment depending on our posture and behavior. A small hole in the ground, for example, might afford shelter for a badger, but not for a human.

Although, for Gibson, affordances are more a physical feature, for performances like larps, affordances can also be social and cultural. Therefore, certain kinds of larp scenarios may afford certain kinds of actions for the players. For example, a scenario, where two players are performing a fight between their

³ Eirik Fatland (2005) has offered the term *fabula* to depict the intentional possibilities for the underlying stories in larps created by the game master(s). J. Tuomas Harviainen (2007) describes them as the “seeds for potential narratives.”

characters, may afford that the players insult each other's characters, glare each other intensively, or even make peace. A scenario where two characters are in love, on the other hand, may afford that the players flirt with each other's characters, hold hands, or even hug or kiss. The affordances are almost unlimited (Montola, 2012) and, therefore, it is up to the players to distinguish between the ones that are "appropriate" or "valid" and those that are not.

In their ecological approach to computer games, Jonas Linderoth and Ulrika Bennerstedt (2007, p.608) propose that, through the process of perceptual learning, players become more and more "attentive to the differences in the perceptual field which shows . . . the game specific affordances in the situation at hand". Hence, the players learn to differentiate between such affordances that exist in the game and those that don't but would exist in "real" life. A similar learning process could be found in larps: in the course of the game the players become more attentive to those affordances that relate to the game's fictional world and learn to ignore those that do not.

The affordances of a larp ecology can be understood in multiple levels. In addition to examining their relation to the game's fictional world, I suggest, that they can also be understood through their functionality in the larp ecology as well as their relation to the traditions and expectations surrounding the ecology. Based on these notions, I claim that at least six different levels of affordances could be distinguished in larp ecologies:

1. *In-game affordances* provide actions for the gaming-world frame;
2. *Off-game affordances* provide actions for the non-gaming-world frames;
3. *Conventional affordances* are usually performed by the players;
4. *Unconventional affordances* are not usually performed by the players;
5. *Dynamic affordances* have strong influence on the course of the game;
6. *Static affordances* have minor influence on the course of the game.

As Gary Allan Fine (1983; see also Mackay, 2001) has classically analyzed, role-playing games operate in three different frames of interaction: the primary social frame inhabited by the people; the game frame inhabited by the players; and the gaming-world frame inhabited by the characters. In terms of what larp ecologies afford to its dwellers, the first two

frames would provide *off-game affordances* that may or may not be game-related, but are, nevertheless, unreachable to the characters in the fiction of the gaming-world frame. *In-game affordances*, on the other hand, provide actions that belong to the gaming-world frame, i.e. the world of the fictional characters. An example of a simple in-game affordance would be to address ones co-players by their characters' names, whereas an off-game affordance would be to address them by their own names.

In addition to affordances being in-game and off-game, they can also be conventional and unconventional. Jane McGonigal (2006, p.242) calls these the "primary" and the "secondary" affordances to describe such properties of everyday objects that are usually applied on them and those that are usually not. A primary affordance of a box would be to open it, and a secondary affordance would be to kick it. In a larp scenario where, for example, a character admires or adores another character, the player could give compliments to that character, seek his or her attention and agree with everything that the character says or does. These would be among the *conventional affordances* of such a scenario. The player could also, however, disagree with that character, ignore everything that the character does, and even ridicule him or her in front of the others. These would be more or less among the *unconventional affordances* of such a scenario, but nevertheless possible courses of action.

The conventionality of affordances in larp ecologies is often culturally bound. Don Norman (2004) suggests that affordances don't only have physical constraints but also cultural ones. He explains that cultural constraints "are learned conventions that are shared by a cultural group" (ibid.). Therefore, it is possible that in some (larp) cultures certain kind of affordances might be performed more likely than others, and in a different (larp) culture a different set of affordances applies. This is a big part of what makes certain affordances conventional and others unconventional. An example of differences in larp cultures could be found between different larp genres. For instance, in a historically accurate medieval larp it would be rather unconventional for a female character, say, a maiden, to grab a sword and attack a king's guard, whereas in a futuristic science fiction larp a female character could very well be a pilot who fights the enemy force in her military spacecraft.

The affordances that certain larp scenarios provide may also be dynamic or static. Dan Pincheck (2009), analyzing specifically computer games, suggests that affordances can be divided into two categories:

those related to gameplay and those related to the game's fictional world. The former have the "capacity to affect other objects" and the latter "do not, but may still exert influence upon the player's experience" (ibid.). In the context of larping, I would call these *dynamic affordances* and *static affordances*. Dynamic affordances in larps are those that, for example, could take the player towards a specific goal or strongly influence the performance of his or her co-players. Static affordances, on the other hand, wouldn't have as much influence on the events of the game but would rather be phatic and meant to simply sustain the fiction of the gaming-world frame. Such static affordances could be for example discussing about the weather, walking around the venue, and eating lunch in the game. It should be noted, however, that clear divisions between dynamic and static affordances are difficult to make: something that might seem like an insignificant action for one player might be very meaningful for another player, and vice versa.

It should also be noted that analyzing the affordances of a certain larp scenario does not mean separating individual affordances into these six categories. Rather, these levels are something that might mix and overlap. Certain affordance in a larp scenario might be at the same time, say, a "conventional dynamic in-game" affordance or an "unconventional static off-game" affordance. For example, in a scenario where a group of local peasant characters are enjoying drinks in a tavern larp, one conventional dynamic in-game affordance for these players could be to behave as if the characters got really drunk and started a bar fight. An unconventional static off-game affordance, on the other hand, could be that one of the players drops out of his or her character and starts to talk about Søren Kierkegaard's philosophy – or something else rather unusual for the situation.

Through the process of differentiating affordances, the players perceive possibilities for actions in the larp ecology. This means that the players perceive what sort of actions their characters could carry out in certain scenarios. The different levels of affordances introduced above may be difficult to realize in improvised scenarios, and the idea of such a list is not to provide us with strict categories in the first place. Rather it offers analytical tools that can help us in understanding the texture of larp ecologies and reveal their diversity and multifacetedness.

3.3 Choosing Between Possibilities

In addition to perceiving possibilities for actions, the player performance in larp ecologies also includes a choice-making process: the players make choices

on which possibilities to carry out. This choice-making is influenced by the players' immediate perception of the scenario and by their past experience on related issues. Antonio Damasio (2006, p.96) suggests that "the factual knowledge required for reasoning and decision making comes to the mind in the form of images." These images constitute our thoughts and they guide our behavior as we move about in the environment. There are two kinds of images: *perceptual* and *recalled*. The former are formed in the moment of perception and the latter in the conjuring up of "a remembrance of things" (ibid). Images can consist of landscapes, music, surfaces, shapes, colours, movements, and tones – anything perceivable or recallable for the observer. Recalled and perceptual images occur side by side in our mind and, as Shannon Rose Riley (2004, p.454) puts it, affect our thinking in an "intentional process of layering" these images.

Mark Fleishman (2009) has come to apply Damasio's images and Riley's notion about their intentional layering to improvisation. He proposes that improvisation "involves a play or dialogue between certain core elements of the existing tradition and the spontaneity of the moment" (ibid., p.132). The tradition includes not only the social conventions and customs of one's culture but also the repertoire of embodied memory manifested in such ephemeral knowledge as performance, gestures, orality and movement (Taylor, 2003). Similarly, the players of larp engage in a dialogue between the immediate impulses of the present, and their past experiences, cultural conventions and bodily repertoire (see also Fatland, 2006). J. Tuomas Harviainen and Andreas Lieberoth (2012) have noted that the players are able to suspend some of these factors in their information behavior – or performance in this case – but, as Diana Taylor postulates, some of the assumptions, values, relations and other parts of our traditions and habitus can remain so remarkably durable and coherent that they inevitably affect our performance.

In addition to these cultural factors, the players' choice-making can also be affected by rational thinking. This rational thinking is often guided by the rules and goals that form the larp ecology. As mentioned earlier, the players usually agree to follow certain set of rules, for example respecting the framework of the fiction, and they might have implicitly emerging goals, for example improving their character's social status during the game. These features emerge in our perception in the process of conjuring up *conceptual categories*.

According to Eleanor J. Gibson and Anne Pick (2000), we use conceptual categories to give meaning

to objects and events. "Developing a concept," for them, "begins with experiencing a number of encounters involving the same affordance; whatever is invariant in these encounters . . . is abstracted by the system" (ibid., p.187). Such abstract concepts include the number and the animacy of substances as well as the sense of agency and causality of events. The latter means understanding that one has control over things and that one's actions can have certain causal effects on those things. As the players extract possibilities for actions from the larp ecology, they perceive what sort of casual effects their actions might have to the ecology and what is their relation to the rules they have agreed to follow and the goals they have decided to achieve.

Nevertheless, sensing the causality of events doesn't mean that the players are always able to – or even willing to – apply rational thinking to their choice-making. Antonio Damasio (2006) suggests that our reasoning and decision-making is fundamentally affected by our emotions and feelings. He argues that pure rational thinking would slow down our decision-making or even prevent it completely because calculating all the possible consequences of our choices and holding their losses and gains in our memory is not always easy (see also Montola, 2012). Therefore, we need emotions and feelings to guide our reasoning.

Emotions are bodily sensations that regulate the circumstances we create for ourselves (Damasio, 2000). In other words, their role is to assist us in maintaining life. This is why considering an option with a bad outcome might give us "an unpleasant gut feeling," or a *somatic marker*,⁴ as Damasio calls it (2006., p.173; see also Lieberoth, 2007). Damasio (2000, p.54) explains that evolution has assembled matching emotions for different stimuli and that is why, "in spite of the infinite variations to be found across cultures, among individuals, and over the course of a life span," we can anticipate certain stimuli to produce certain emotions. Hence, in addition to the cultural factors and the rational thinking that is usually based on the rules and goals of the game, the choice-making process of the players in a larp ecology is affected by the emotions and feelings of the players as well as the somatic responses they experience in relation to the larp scenarios.

It should also be noted that the choice-making process of the players operates in multiple levels. Because the larp ecology includes all the frames of interaction

introduced by Fine (1983), it is natural that the players interact in all of these levels during the game. The choice-making process includes, at the same time, the viewpoints of the character, the player and the person. All of these affect the choice-making and all of these influence one another. Nevertheless, although the choice-making process operates simultaneously on multiple levels, the players can - and are usually expected to - choose which frame they situate or "key" their performances into (Bateson, 1973; Goffman, 1974). This is an essential part of the "boundary control" (Harviainen, 2012a) that the players practice in order to sustain the fictional gaming-world frame.

3.4 The Embodiment of Possibilities

The choice-making process in larp ecologies culminates in the embodiment of the possibilities that the players have decided to perform. This is the phase in which the players carry out the transportative performatic actions that represent their choices. They perform these actions by applying their bodily repertoire, such as gestures, postures, facial expressions, speech, and tone of voice, to the performance. The way they arrange these bodily repertoires compiles the behavior of the characters and weaves together the texture of the ecology. To borrow an analogy from Richard Schechner (2006, p.34), it is as if a film director organizes strips of film to compile the final work.

The way the players arrange the performance of their bodily repertoire may have considerable influence on the actions of other players. As discussed earlier, the actions of players are essentially dependent on the actions of other players. Even the tiniest gesture or tone of voice might affect what sort of information the other players pick up and how they extract possibilities from it. And, as also noted earlier, even the choice not to act or to act in isolation from the other players affects the performance. This is due to the hypothetical possibility that what could have been performed or what could have been perceived might have had a different influence on the performance of other players. Thus, whatever the players choose to do during the game, eventually, has an impact on the larp ecology.

The arrangement of the bodily repertoire may be intentionally planned and carefully executed but it can also be spontaneous and less systematic. Larping and other role-playing games have considered to have different methods of performing, such as the vastly analyzed immersionist playing in which the players throw themselves into the flow of the game and forget the surrounding world (e.g., Pohjola, 2004; Ermi and Mäyrä, 2005; Holter, 2007;

⁴ Damasio calls the phenomenon a somatic marker because the feeling is about the body. "Somatic" comes from the Greek word for body, soma, and "marker" comes from the idea that "it marks' an image" (ibid.)

Hopeametsä, 2008). The players might prefer using certain methods game after game but it might also be that such “playing styles” vary, get mixed and overlapped between and during games (Kim, 1998; Bøckman, 2003; Harviainen, 2006).

The way the players embody possibilities is inherently defined by their bodies. According to Mark Johnson (2008, pp.165-166), we experience our bodies at least in five interwoven dimensions: *the biological organism* that perceives, moves, responds and transforms; *the ecological body* that cannot exist independent of its environment; *the phenomenological body* that is how we live, feel and experience what we are; *the social body* that develops in a dialogical relations with our social others; and *the cultural body* that constitutes of gender, race, class, aesthetic values, and so on. Johnson (ibid., p.167) explains that “our embodiment shapes both what and how we experience, think, feel, value, and act,” and that “it shapes who we are in such a way that it is implicated in all of our possible self-descriptions.” Because of this, I would argue, also larp characters as sort of “self-descriptions” implicate the experiences, conceptions and restrictions the players have in their bodies. This is also why such phenomenon as bleed ⁵ can occur in the player performance (see also Montola, 2010; Lankoski and Järvelä, 2012; Bowman, 2013).

Whether it be, say, an intentionally arranged set of gestures and facial expressions, or an unintentional consequence of a bleed effect from a player’s personal life to the game, everything, that gets embodied during a larp, is essentially part of its texture. Thus, all the actions the players carry out shape the larp ecology. These actions manifest the results of the individual player experiences, and they can become the object of a performance analysis on the event.

5. CONCLUSIONS

In this article, I have outlined an ecological approach to the performance of larping. It was chosen because of its comprehensiveness: an ecological approach intertwines and interconnects everything in the system and leaves nothing out. It is, by nature, an inclusive way of looking at performance. A larp ecology could be described as a comprehensive interdependent system where all the players and other organic and non-organic components of the game support each other. The performances of the individual players can be regarded as cultural improvisation formed as lines that the players

weave together and the interweaving of the player performances composes the texture of the larp ecology.

The performance of larping consists of four steps: information pickup, extraction of possibilities, choice-making and embodiment. During the event, the players pick up information from the larp environment and extract possibilities for actions from that information. The players are continually making choices on which possibilities to carry out, and they embody those possibilities by applying their bodily repertoire to the performance. These steps are not to be seen as a chronological or an intentional process, but rather as an overlapping and interconnected one. The players may not be aware of such aspects constituting their performance – and they do not even have to.

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⁵Bleed is concept that is used in role-playing to depict a situation where a player’s everyday social self influences the game, or vice versa (Montola, 2010).

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Cognitive Intervention and Reconciliation: NPC Believability in Single-Player RPGs

Popular abstract: Characters in single role-playing games are often lacking plausibility. This is especially the case with Non Player Characters (NPCs) in single-player role-playing games. It does not take long for game players to sense that NPC behaviors are limited and improbable. Computer scientists working on Artificial Intelligence have recognized the importance of believable characters. However, studies of NPC believability in single-player RPGs have been relatively rare since the definition of believability has different meanings in different fields of studies. In this article, a new definition of NPC believability is suggested. This definition is based on theoretical frames, which offer diverse definitions of believability. Several suggestions on making believable NPC are addressed.

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1. INTRODUCTION

In single-player RPGs (Role-Playing Game), all characters in the game world are controlled by a computer (NPC: Non Player Character) except a player's character (avatar). These characters are actors and actresses of a fictional fantasy world where a game character will explore for given missions. NPCs, however, are often not believable. For example, the owner of a pizza store in the video game *Grand Theft Auto: San Andreas* (Rockstar Games, 2004), is acceptable as long as the game player stays in the prescript behavior patterns, which include ordering and paying for a pizza. When game play diverges from the expected behavior patterns, such as accosting the owner of the pizza store without provocation (or stealing his money), he doesn't exhibit any reasonable behaviors. Some single-player RPGs like "*The Elder Scrolls IV: Oblivion* (Bethesda Softworks, 2006)" are populated with more intelligent NPCs that reside in a game world with their own daily schedule, but they are still far from being believable. At first glance, NPCs in single-player RPGs seem to do what they are supposed to do, but game players easily find that their behavior patterns are very simple and limited.

A simplistic prescript behavior of NPCs may actually prevent gamers from feeling fully immersed in the RPG experience (Cutumisu et al., 2006). Although NPCs in single-player RPGs where there is only one character controlled by human player, may look like player characters, their behaviors clearly mark them as artificial and limited. Because they look like player characters but act like machines, NPCs are usually not believable participants in the role-playing game world.

In single-player RPGs, casting appealing and believable characters parallels the importance of lack

characters in fiction. Some research indicated that of believability on NPC design could result in less meaningful game experience (see Afonso and Prada, 2009). Perceived believability is expected to increase players' feeling of immersion (Watson, 2002; van Doorn and de Vries, 2006; Bhatt, 2004) and their enjoyment (Brown and Cairns, 2004). Creating more believable NPCs is likely to result in better role-playing game experiences.

Recently, video game research have focused more on topics around player characters (e.g., Lankoski, 2011; Trepte and Reinecke, 2010), but studies around NPCs, such as a definition have been rare in social science context.

In this article, a synthesis of literatures related to perception of NPC believability and theoretical frames to understand the phenomenon are provided. In order to define NPC believability under single-player RPG situation, definitions and concepts of believability in different areas were reviewed as fundamentals of understanding NPC believability. With this ground, the perception of believable NPCs is examined in light of related theoretical frames to understand how and why people respond to NPCs in believable ways. Our focus is providing a new definition for believable NPCs with various theoretical frames based on our understanding of believability in related areas. Then, qualities as building blocks to build believable NPCs are scrutinized and grouped into five categories. Summary of findings and some practical tips are provided in the end. For better understanding of perceiving NPCs believably in RPGs, the scope of this study will be confined with topics around NPCs.

2. LITERATURE REVIEW

2.1 Non Player Character

A term NPC describes all of the game characters that game players cannot control. Considering its importance in single-player RPGs, however, NPCs don't have enough attention from the academe. NPCs are the characters that help, guide, and communicate with players to accomplish the goals of the game without being controlled by players.

In most RPGs, game players take on a main character role (protagonist) by choosing an avatar, while various NPCs take the supporting roles that interact with the player's character (PC). The quality of this interaction directly affects game players' evaluation of the game (e.g., Afonso and Prada, 2009). However, Jørgensen (2010) argued that giving the protagonist role to another character (NPC) would be interesting technique regarding game narratives since it would reduce the burden of player character in the story progression. A research claimed that believable NPCs would make video game narrative more realistic (Riedl et al., 2006). Game players' game experience is closely related to the perceived realism on NPCs. Whether being protagonists or taking supporting roles, NPCs are important actors/actress in the game narratives.

The experience of interacting with NPCs, however, is not like that with human being (e.g. Shechtman and Horowitz, 2003). People used more words and spent more time when they were interacting with human beings than with computer program. They believed that their computer-generated opponents were "predictable, easy to defeat, and boring to play against" (Sweetser et al., 2003). Similarly, West (1998) observed that gamers would rather play with/against entities that were believed alive. People prefer playing with other human beings, or at least with NPCs that render enough social cues.

Despite the fact that people prefer to playing with human-beings rather than computer generated characters, NPCs still play very important roles in our game experiences. According to Schreiner (2002), there are three reasons why we could not do away with NPCs. First, every player wants to be the master of his or her game. They do not want to take a utility role, which will be monotonous and tedious. This is consistent with the Zubek and Khoo's (2001) finding about fascinations of game coming from defeating NPCs. Second, some characters with higher power to control game environment should be played by NPC as well as lower level characters that are taking

utility jobs. In a simulation game such as SimCity, it is OK for NPCs to take utility roles, but gamers will lose their taste immediately if they realize that their partners are playing with higher power. NPCs need to take care of power conflict among gamers in some network-based games. Third, NPCs hold important roles of game in terms of story line. There are some games that do not need a strong story line, such as Tetris and puzzle games. In single-player RPGs, however, game players will only wonder around the game environment seeking a key or hint without help of NPCs.

In spite of their importance in game experience, the current NPCs have failed to meet game players' expectation only providing shallow and unfulfilling game experience. Baillie-De Byl (2004) argued that creating a cheating NPCs would be more important than elaborate AI system. Reeves and Nass (1996) also stressed the importance of subjective perceptions rather than objective reality. In the same token, game players recognize NPCs as very unintelligent, not based on the intelligence they perceive, but based on the aptitude.

2.2 Believability

The definition of believability has been studied in many areas such as workplace gossip (Berkos, 2003), cigarette warning labels (Beltramini, 1982), and alcohol warning labels (Andrews et al., 1991). Similarly, source credibility has been studied in connection with believability from communication and journalism research (e.g. Ewing, 1940; Hovland et al., 1953; Brehm and Lipsher, 1959; Pastore and Horowitz, 1955). Some recent research with robot considered credibility as equivalent to believability (e.g., Fogg and Tseng, 1999). However, NPC believability is not necessarily related to truthfulness or credibility. Mateas (1997) pointed out that a believable computer agent may NOT be trustworthy and may possibly not tell the truth. Rather, characters are "artistic abstractions of people, whose behavior, motivations, and internal life have been simplified and exaggerated in just such a way as to engage the audience in the artist's vision" (Mateas, 2002).

In a very similar way, people experience the "likeness" of the character with a real person who may exist in the real word when people encounter a computer character in a game like single-player RPG.

The concept of believability is rooted in its relation to the arts (literature, theater, film, radio drama, etc). Many film theories have argued that film causes cognitive illusion (e.g. Arnheim, 1957). According to

Currie, the early film theorists' arguments regarding cinematic realism can be categorized in one of three degrees: transparency, likeness, and illusionism. He argued that the realism people experience when they watch a film can be "likeness" doctrine, which claims the experience of watching a movie is like the experience of perceiving the real world (Currie, 1995).

Bates (1994) described believability as "the illusion of life, thus permitting the audience's suspension of disbelief" in his study of the role of emotion on believable characters. The origin of the expression "suspension of the disbelief" can be found in a Samuel T. Coleridge's autobiography, *Biographia Literaria*. Coleridge used the expression to describe the relation between reader and literature. Many definitions of believability share this common ground of cognitive illusion on life-forms (e.g. Bates, 1994). In other words, people come to believe that the characters they are interacting with are real.

The phenomenon of willing suspension of disbelief arises when fictional or virtual characters, events, or worlds contradict what the audience knows to be real. People willingly suspend this disbelief for the pleasure of the story. Suspending disbelief does not mean that viewers/readers believe everything they see or read; rather, it means that they don't reject the story because they disbelieve what they perceive. This explains how a fabricated story enables people to believe unrealistic things for the enjoyment of reading. However, the usefulness of Coleridge's concept is still in debate (e.g. Walton, 1978; Radford and Weston, 1975). Carroll, for example, pointed out its underlying premise as false arguing people cannot control what they believe (Carroll, 1990). Recently, Lankoski (2011) is empathic to this critique in his study of computer games.

The concept of believability was first described and used by traditional cartoon animators who speculated about how they achieved the believability in the characters they drew. Charles M. Jones (1989), a master of animation, who directed many Warner Brothers animated characters, such as Bugs Bunny, Daffy Duck, Elmer Fudd and Porky Pig, stressed the importance of believability in animated character design bringing a character to life. Animators at Disney have tried to illustrate their characters as living entities that can think and act by their own volition to create the illusion of life (Thomas and Johnson, 1981). The goal of these early animators was to create the illusion of life, facilitating viewers' willing suspension of disbelief. Computer scientists and artificial intelligence researchers might borrow

the practices of these early animators to make computer characters more believable (see Bates, 1994). However, the interactive characteristic of computer characters poses additional challenges. Unlike watching TV cartoon animations, the interaction between users and computer character is bidirectional.

Most of studies on computer agent have focused on its intelligent ability based on the belief that the more intelligent an agent is, the better it is. However, there has been skepticism on the appropriateness of the intelligence as the most representative attribute of the agent (Lidén, 2003). Especially the embodiment of such an intelligent agents requires strong visual representation in order to provide more vivid feedback to users (Johnson et al., 2000).

Many researchers in various related fields have begun to recognize the importance of creating believable synthetic characters in virtual worlds (e.g., Aylett, 1999; Szilas, 2003; Mateas, 1997), computer games (e.g., Bhatt, 2004; MacNamee and Cunningham, 2001), interactive drama (e.g. Mateas, 1997), and embodied agents (e.g., Ortony, 2002; Lester et al., 1997; Nijholt, Lester, and Stone, 1997). In an interactive drama, for example, players can participate in a story in a virtual world that is populated with computer-controlled characters. Weizenbaum (1966) was able to create a virtual psychotherapist agent called ELIZA using natural language. He reported that some subjects were hard to believe that it is not human being arguing illusion of understanding was easy, but no empirical data with subjects was provided.

Regardless of their disciplines, researchers seem to agree with the importance of creating believable characters. When it comes to a question of what makes a computer character believable, a series of human qualities ranging from physical characteristics to psychological traits has been proposed as key factors. For instance, the Oz Project at Carnegie Mellon University identified a set of requirements for believable characters including personality, emotion, self-motivation, change, social relationships, and the illusion of life (Loyall, 1997).

Some researchers focus more on one or a few specific core qualities to provide practical design guidance. Freeman coined the term *emotioneering*, which is a set of techniques that can be used to create different emotions in computer characters (Freeman, 2003). He suggested some practical tips for making NPCs with emotional depth, such as hiding a secret/shame, regret, etc. On the other hand, Isbister (2006) suggested using a psychological principle

such as stereotypes to design better game characters. She argued that a character with a baby face would be perceived more warmer and trustworthy but less reliable. Some have tried to measure believability of NPCs. Lankoski and Björk (2007) evaluated the level of believability with Claudette Perrick, an NPC in the game *The Elder Scrolls IV: Oblivion*. They used a list of descriptions called *Gameplay design patterns* (Björk and Holopainen, 2005; Björk et al., 2003), which are mutually related and reoccur frequently in the design of a gameplay. However, gameplay design patterns were used only to identify potential believability failure points in character design. No direct measurement of character believability was attempted.

2.3 Qualities of Believable NPCs

Many studies in the related fields address the importance of creating believable agents. The qualities, as well as meaning of their believability, vary by the field of study. A comprehensive literature survey can help to combine and categorized diverse believability paradigms. In this paper, we investigated many believability qualities of computer generated character in many related fields, such as computer science and communication, and grouped them into several categories that have similar concepts. The analysis of believability qualities produced five key believability categories: appearance & behavior, personality, goals, emotions, and social relations.

2.3.1 Appearance & Behavior

Computer scientist Hayes-Roth and colleagues described the appearance of an animated character

as “the encoding of each characters’ identifying demographic information – age, weight, gender, socioeconomic background and culture in the chosen embodiment of the character, as well as the representation of this embodiment” (Hayes-Roth et al., 2002). According to the definition, appearance not only includes static, visible attributes, but also animated gestures and nonverbal behaviors (e.g. Hayes-Roth and Doyle, 1998). Appearance and behavior category include visually perceivable qualities at a glance (see Table 1).

According to Hayes-Roth and Doyle (1998), behavior animation is the core quality of believability of an animated character. In defining seven requirements of believable behaviors in animated characters, they specified that behaviors have to be diverse to offer many possible scenarios but normative to appear life-like, ambient enough to invite players’ attention without distraction, and unique enough to distinguish one animated character from all others. Bates (1994) also confirmed that appearance of reactivity is one of essential demands for believability in interactive character design. In the study of constructing comprehensibility as an essential factor of a believable agent, Sengers (1999) pointed out that the agent’s comprehensibility came from “thinking out the connections between behaviors and displaying them to the users”. Also the behavior patterns of computer characters should be complex enough to avoid creating an impression of simplicity.

Overall, the appearance and behavior category describes all the qualities that are exposed to human visual sensory input that communicate the information, such as gender, age, ethnicity, height,

Table 1: Character Qualities Related to Appearance and Behavior

Quality	Author	Context
Nonverbal Behavior	El-Nasr et al., 2009	Believable Characters
Appearance, Identity, Manner of gesture, Manner of speak, Content of speech	Hayes-Roth, Maldonado & Moraes 2002	10 key qualities in animate characters
Behavioral cues	Sengers 1999	Comprehensive agents (comprehensibility)
Behavior	Hayes-Roth and Doyle 1998	7 behavioral requirements of believability in animate characters
Situated Liveness, Controlled visual impact, Complex behavior pattern	Lester and Stone 1997	Three believability criteria in Animated pedagogical agents
Consistency in expression, appearance of goals	Loyall 1997	Requirements of believable agents
Language	Loyall and Bates 1997	Requirements of believable agents
Lack of ambiguity in expression	Letster et al 1997	Deictic believability in animated pedagogical agent
Appearance of reactivity	Bates, 1994	Believable agents

socioeconomic status, etc. When people look at a computer character, they make guesses on not only what kind of a character it is but also how they can interact with it based on the context and information perceived by their sensory inputs. Studies based on believability triggered by a character's appearance and behavior patterns suggest that the representations of computer agent appearance and behaviors mimic life. In the same context, consistency of expression and appearance of goals (Loyall, 1997) and lack of ambiguity in expression (Lester et al., 1997) were also proposed as key techniques for increasing the believability in agents.

Any qualities in the character appearance and behavior category shouldn't imply that having a human appearance is a necessary condition to perceive it as believable (Loyall, 1997). Mateas suggested that non-human computer agents also could be useful because of lower expectation compared to anthropomorphic agents. However, lower expectation doesn't come entirely from the non-humanness of agents. The decrement of expectations is also related to low level of fidelity and realism on the agent regardless of whether it is human-like or not. Similarly, comic artist Scott McCloud (1993) noted that the more visually realistic a comic character is, the harder it is for people to think of the character as being like themselves. In other words, a smiley face could be anyone, including the player, but a photorealistic Arnold Schwarzenegger is clearly not the player.

As research suggests, qualities in the character appearance and behavior category can be representations of other believability qualities. For example, personality can be achieved by the visual design of appearance. All perceivable visual and audio information is closely related to the other key qualities of believability. It is critical to design the appearance of computer characters based on their roles in the context where they are. Qualities in the appearance and behavior category are usually perceived first, and players establish a kind of expectation based on the information from it. Even in a case where there are only limited amounts of visual information, human beings are capable of constructing a kind of an image of the character based on the available information. Hayes-Roth, Maldonado, and Moraes (2002) confirmed the importance of appearance in character design saying "(appearance) affects the character's effectiveness and credibility at performing its assigned role, and directs the patterns of interaction. Even before the character speaks a single word, even before the page is completely loaded, the visitor has already processed the subliminal cues embedded in the

character's representation, such as the relative status and occupation of the interactors, and formed a model of what pattern the ensuing interaction will follow". The character appearance is not a mere representation of characters' visual information, such as demographic information. Rather, it is an image of characters reflecting other character qualities.

Similarly, Wardrip-Fruin (2009) argued that giving very expressive appearance without connecting to its underlying models could result in a wrong impression of the characters. He introduced two opposite effects (The Eliza effect and The Tale-Spin effect), which were lessons from the past interactive drama projects. The Eliza effects refers to a computer agency (character), which creates wrong (much more complicated) surface impressions than the actual internal system logics while the Tale-Spin effect occurs when characters (characters) fail to deliver the precise complexity of the internal system thus creating over-simplified surface impressions. Wardrip-Fruin proposed an approach achieved by *The Sims* in which character expression is engaging as well as a good reflection of the underlying system. In character design, the principle of consistency is a prerequisite for fidelity.

2.3.2 Personality

Personality has been one of the most important aspects of believability for cartoon animators. Thomas and Johnson (1981) described importance of the personality as "For a character to be that real, he must have a personality, and, preferably, an interesting one." More recently, personality has been suggested as one of the most critical factors in creating believable agents (Bates et al., 1994; Allbeck and Badler, 2002; Romano and Wong, 2004; Reilly, 1997).

The Oz project at Carnegie Mellon University was the first attempt to develop a believable agent in an interactive story environment. In the project, computer scientist Loyall (1997) defined personality as "all of the particular details – especially details of behavior, thought and emotion – that together define the individual." Similarly Hayes-Roth et al defined personality as a group of psychological characteristics that differentiate one entity from others (Hayes-Roth et al., 1997). Rousseau and Hayes-Roth (1997) proposed a computer agent model in which actions were driven by its personality and mood rather than its goal to produce a more dramatically believable and interesting character. Mateas (1997), another researcher of the Oz project, defined personality as the thing that inspired every single behavior of a

Table 2: Character Qualities Related to Personality

<i>Quality</i>	<i>Author</i>	<i>Context</i>
Personality	El-Nasr et al., 2009	Believable Characters
	Isbister 2006	Better Game Characters
	Drennan 2004	Believable conversational NPC
	Romano,Wong 2004	Believability of virtual character
	Lankoski, Heliö, & Ekman 2003	Characters in computer games
	Allbeck and Badler 2002	Representing agent
	Isbister and Nass 2000	Interactive characters
	Mateas 1997	Requirement of believability
	Loyall 1997	Requirement of character believability
	Rousseau and Hayes-Roth 1997	Believable synthetic actors
Reilly 1997	Believable social agent	
Reilly and Bates 1995	Believable social agents	
Bates, Loyall, Reilly, Castelfranchi, and Wemer 1994	Architecture for Autonomous agents	
Persona	Hayes-Roth and Doyle 1998	Believable animate character
Identity	Hayes-Roth, Maldonado and Moraes 2002	10 key Believable qualities in animate characters
Back story	Hayes-Roth, Maldonado and Moraes 2002	10 key Believable qualities in animate characters
Goal based personality	Rizzo et al 1999	Personality and social behavior in believable agent

character from very simple behavior, such as talking, to very cognitive activity, such as reasoning. To him, personality is “something unique and specific.” Mateas (ibid.) discussed other qualities of believability, such as emotion and change, but he argues they must be consistent with the personality of the character.

Personality defines uniqueness and peculiar qualities of computer characters that distinguish themselves from other computer characters. Some qualities of personality are closely related to psychological traits. Goldberg (1993) proposed the big five personality traits (agreeableness, extraversion, neuroticism, conscientiousness and openness to experience) through empirical study of the human personality. Among other psychological traits, Isbister (2006) claimed that extroversion and agreeableness are the first qualities human beings investigated when they met strangers for their survival.

Some computer scientists have tried to construct personality on synthetic computer characters by giving a unique combination of the parameters that constitute basic personality traits as Goldberg suggested (Bates, 1992; Rousseau and Hayes-Roth, 1997). Rizzo et al. (1999) designed goal-based personalities. Isbister and Nass (2000) demonstrated the importance of consistency of personality in interactive characters. Lankoski et al. (2003) stressed

the importance of personality in computer game characters.

Regardless of its importance, however, personality category doesn't include any implemental qualities. Rather, it indicates the direction of realization constructed by other executable qualities, which exist in subordinate hierarchy of NPC believability. With nonverbal behavior and animation, Seif El-Nasr et al. (2009) also confirmed that personality could be delivered by other means (ex. Body type).

2.3.3 Goals

Hinting at thought processes through visual, nonverbal means was not easy to implement for early animators. They knew expressing the thought process of cartoon characters was important, but they didn't know how to reveal it. According to Thomas and Johnston (1981), it was the animation of a dog that looked into the camera and snorted that gave them the idea of making cartoon characters appear to think.

Loyall (1997) insisted that a self-motivated character should not only appear to think, but also have to show emotion of its own volition. “Pluto snorting was not what was powerful; it was that he was doing it of his own accord, instead of in reaction to some external stimulus” (Loyall, 1997). Similarly, character intentionality (goal) is “...the way in which the choice

Table 3: Character Qualities Related to Goal

<i>Quality</i>	<i>Author</i>	<i>Context</i>
Goals	Lankoski 2012	Computer games and emotions
	Bates 1994	Believable agents
Self-motivation	Loyall 1997	Requirement of character believability
	Mates 1997	Requirement of believability
Role, Role dynamics	Hayes-Roth, Maldonado and Moraes 2002	10 key Believable qualities in animate characters
Goal preference	Rizzo et al 1999	Personality and social behavior in believable agent
Intentionality	Riedl and Young 2005	Character believability

of actions and behaviors that a character makes appears natural (and possibly rational) to external observers” (Riedl and Young, 2005). Goals directly affect all other qualities of NPC believability. For instance, the outfit of an NPC should be designed carefully with a consideration of its role. If it is a kind of tutoring character that teaches how to cook, it may be more natural for players to expect the agent to wear a high chef’s hat and white uniform. Like personality, goal is a precursor to other NPC believability traits; it helps to define appearance, emotion, and behavior (Bates, 1994; Rizzo et al., 1999; Hayes-Roth et al., 2002).

2.3.4 Emotions

Emotion has been another key quality for believable agents (Loyall, 1997; Hayes-Roth and Doyle, 1998; Hayes-Roth et al., 2002; Bates et al., 1994; Romano and Wong, 2004; Reilly and Bates, 1995).

For the early animators like Thomas and Johnson (1981), the portrayal of emotions “has given the Disney characters the illusion of life.” They especially focused on several considerations to convey the emotional state of cartoon characters: clear definition of their emotional state, revealing their thought process through emotions, and use of time to emphasize the emotion. Bates (1994) adapted Thomas and Johnson’s principles of revealing cartoon character emotions and applied them to the design of the emotion of “Woggles” (self-animating creatures in a simulated world that was a small portion of the Oz project). In order to define their emotional states clearly, Woggles only had one or two primary emotions with appropriate intensities. Also Woggles’ emotions were mapped to specific behaviors with specific personality to reveal their thought process. One emotion could be mapped to two different behaviors based on the personality of characters. However, Bates (1994) did not use animation techniques (for example, exaggerating) to emphasize Woggles’ emotions. He explained the value of character emotion as “... helps us know that

characters really care about what happens in the world, that they truly have desires.” Emotion signals an NPC’s aliveness, creating the illusion of life.

Ortony (2002) re-categorized the conditions in which emotions can be generated, and he suggested five positive and negative conditions for believable agents. He pointed out the importance of consistency between internal responses (emotions) and external responses (behaviors) in believable emotional agents. Mateas (1997) argued that the emotions of a believable NPC should be expressed in unique ways (akin to and supporting the uniqueness of personality) confirming Ortony’s point. Wooldridge and Jennings (1995) cited emotion as a key component of believable agents that makes them appear to respond to human emotions in appropriate and consistent ways. Similarly, Waern (2011) studied the romantic gameplay in a single-player RPG, *Dragon Age* and found that the emotion of player and character could get blurred throughout game play. Lankoski (2012) explained emotion game players experienced in the course of game play related to goals of game characters. He insisted that some video characters could be frightening because they threaten a player’s goals by fictionally threatening his/her character.

The emotion category does not prescribe what kinds of emotions believable NPCs have to possess. Rather all of the research regarding a character’s emotion suggests that it is important for believable NPCs to clearly exhibit emotions of their own. The emotion category requires believable NPCs to reveal their emotions as an outcome of unseen internal processes. At the same time, they should respond to players’ emotions correctly in a given context. The explicitness of emotion needs to be clear enough that players can distinguish each emotion at a glance. The expression of an NPC’s emotional state should be neither ambiguous in meanings nor weak in strength. Emotional states should be revealed through multiple channels such as facial expression, gestures, etc. In some cases, for example, it may be hard to notice emotions only by looking at the facial expression of an NPC either because the face is too

Table 4: Character Qualities Related to Emotion

Quality	Author	Context
Emotion(s)	Lankoski 2012	Computer games and emotions
	Isbister 2006	Better Game Characters
	Drennan 2004	Believable conversational NPC
	Romano and Wong 2004	Believability of virtual character
	Ortony 2002	Believable emotional agent
	Loyall 1997	Requirement of character believability
	Mateas 1997	Requirement of believability
	Reilly and Bates 1995	Believable social agents
	Wooldridge and Jennings 1995	Believable agents in the context of intelligent agents
	Bates, Loyall, Reilly, Castelfranchi, Wemer 1994	Believable agent
Empathy	Bates 1994	Emotions in believable agents
	Waern 2010	Emotions in romantic gameplay
Empathy	Hayes-Roth and Doyle, 1998	Believable animate character
Emotional dynamics	Hayes-Roth, Maldonado and Moraes, 2002	10 key Believable qualities in animate characters
Emotional reaction	Rizzo et al, 1999	Personality and social behavior in believable agent
Emotional reactivity	Bates 1994	Suggested as believability demands on an interactive character

small or the face may be looking away. Body language and motion can help convey character emotion.

However, it is not easy to show a right expression of a right emotional state at the right time. Unlike cartoon characters that can express their emotional states based on pre-scripted linear narratives, NPCs' expressions of emotional states are hard to plan in advance because their emotional responses are chosen and altered by human beings' interaction. NPC design should include a range of possible emotional states anticipating specific circumstances, and each actual emotional state of a computer agent should be appropriate for the circumstance under which it is enacted so that players do not experience cognitive dissonance.

2.3.5 Social Relations

The early animators didn't recognize characters' social relationships at first because different animators drew each character in a cartoon. When one animator drew all the characters in a scene, the importance of character relations was recognized. Thomas and Johnston (1981) wrote:

...the Bambi and Thumper sequence had something that the Pluto and Donald sections did not have. That was a character relationship with strong beginnings in the story department. ...With this as a springboard, the animator continued developing this relationship, which only could have been done by one person

handling both characters and completely controlling every single bit of action, timing, and cutting. ...This new way of working with character relationships encompassed the whole range of relations between two or more characters—from the broadest to the most delicate. It involved expression scenes that often registered the most secret thoughts and inner emotions of the characters, which as they became more subtle were also more revealing.

Studies on believable agents insist that social relations among computer characters influences interaction patterns among them and are influenced by the interaction in turn (Bates, 1994; Thomas and Johnson, 1981; Mateas, 1997). Some studies described a social aspect to the interaction between computer characters and players (e.g. Hayes-Roth and Doyle, 1998; Hayes-Roth et al., 2002). Loyall insisted that social relations among characters should be designed carefully with detailed behaviors and interactions to reveal the relationships among characters (1997). Hayes-Roth, Maldonado and Moraes (2002) argued that the context of the interaction is even more important than the actual content itself. According to them, cultural differences, the tempo of turn taking in conversation, initiatives of the conversation, etc. can be more important to create believable agents than social relations between characters, especially

Table 5: Character Qualities Related to Social Relations

<i>Quality</i>	<i>Author</i>	<i>Context</i>
Social-relationship	Isbister 2006	Better Game Characters
	Loyall 1997	Requirement of character believability
	Mateas 1997	Requirement of believability
Situated Social competence	Bates 1994	Believable agents
Social relation	Hayes-Roth and Doyle 1998	Believable animate character
Social interaction patterns	Hayes-Roth, Maldonado and Moraes 2002	10 key Believable qualities in animate characters
Social Interaction	Afonso and Prada 2009	Improving the social believability of NPCs

in a one-to-one interaction environment with only the player and a single character. A NPC that appears to have a social relationship with other NPCs helps players willingly suspend their disbelief and conceive of the character as real. Of course, social relationships between NPCs cannot exist in environments limited to one-to-one interaction between the player and an isolated NPC. Most interactions with pedagogical agents, for example, only occur directly between the agent and human player. In their study with human subjects, Afonso and Prada (2009) created a RPG with two different versions: one with no social interaction among NPCs and other with social relation. They found that gamers preferred a RPG with socializing NPCs much more than a RPG with NPCs that did not socialize each other.

The social relationship between an NPC and human players also can affect the perception of believability. Nass et al. (2000) find that people feel more attraction and trust with a computer character that has the same ethnic background as the users than with one that has a different ethnic background. The more users feel a social connection with computer characters, the more the believable character will seem. In role-playing game environments that have multiple NPCs and avatars, the social relations among NPCs should enhance yet not overwhelm or otherwise interfere with the interaction between players and NPCs. Both NPC-NPC and NPC-player social relations should seem natural. Isbister (2006) emphasized the importance of a character's modalities, such as body and face as social equipment to reveal the context of the interaction.

Many of the above believability qualities were also reported in other contexts as well. Lankoski (2007), for example, listed many of NPC believability qualities as source of believable conflict between player characters and non-player characters. Our intention is to provide review of empirical qualities of believability assuming that the interaction with NPCs might not be directly related to any specific scenario since all the above qualities are inter-related.

3. NPC BELIEVABILITY

3.1 Automatic Reaction to Social Cues

One aspect of NPC believability lies in the fact that people respond to characters that hold some social cues. When people encounter NPCs in games, for example, they respond to them in a very similar way as they do with other people in the real world. The response to the NPCs is very automatic and natural even though people know they are not real. Social Response to Communication Technology perspective (also known as the 'media equation') explains this automatic reaction with human nature: people react very similarly to social cues from humans and social cues from characters acting like a human (e.g., Nass et al., 1996; Nass et al., 1999; Nass and Moon, 2000). For example, people are even polite to computers. When asked to evaluate the performance of a computer, people tended to give more positive feedback about its performance when the same computer asked for the evaluation (Reeves and Nass, 1996). When another computer asked to evaluate the same computer's performance, people gave less positive responses, perhaps because they were not as concerned about hurting the original computer's feelings.

The automatic reaction to social cues is closely related to people's cognition of something's existence. Social science researchers have developed definitions and measurement constructs of presence (e.g., Lombard et al., 2000; Barfield et al., 1995). Creating a sense of presence has a core goal of mediated communication systems such as virtual reality, video games, and linear mass media. For example, Schroeder (2002) described presence as a medium's capability of evoking the feeling that a human user is physically present in a virtual environment. Heeter (1992) suggested three dimensions of presence as a feeling of being there in her study of virtual reality: personal presence (I am there), social presence (you are here), and

and environmental presence (the virtual environment exists).

Slater et al. (1995) stated that presence depended partly on the two matches: a match between sensory input and proprioceptor, a match with sensory input with internal representation. Presence shares common ground with NPC believability: Matched experience. However, presence is different with NPC believability in that it depends upon intentional cognitive involvement, while other dimensions are perceptual rather than judgmental. NPC believability takes care of the cognitive aspect of presence and makes the perception of it smooth and automatic. NPC believability is associated with *willing suspension of disbelief*, which is not automatic, while belief, for example, is automatic (Reeves and Nass, 1996).

Nowak and Biocca (2003) investigated differences in how people respond to different entities (agents, controlled by a computer, and avatars, controlled by person) as well as different levels of anthropomorphic visual representation (high-anthropomorphic, low-anthropomorphic, and no image) with three different forms of presence (telepresence or a sense of being there, copresence, or a sense of being with, and social presence, a sense of interpersonal interaction). They found that whether the entity is an agent or avatar didn't influence the feeling of presence in general. An entity represented by an image results in a stronger experience of presence than entities with no image. This result supports the notion that, by default, people tend to assume any entity is human when sparse information is provided. There is an underlying assumption that someone else is "like me" unless information contradicts that assumption.

In his study of game players' empathic reaction to computer character, Lankoski (2011) also confirmed the automatic aspect of social interaction with game characters. He argued that understanding human beings and game characters shared the same ground: mimicry and empathy and the process of mimicry was involuntary and automatic. Similarly, Waern (2011) argued that game players could experience so-called "bleed" effect (where the distinct boundary between players and characters is blurred) with their characters in computerized games in her study of engagement in romance based on the investigation of blogs and comments from game communities.

3.2 Perceptual Realism Judgment

At the same time, people seem to evaluate the likeness of entities they encounter in both the real and virtual world. By evaluating the level of realism they perceive, humans seem to construct an

expectation about an entity they are interacting with. Japanese robotist Mori (1970) introduced the concept of an "uncanny valley" in human reactions to anthropomorphic robots. According to Mori, as the realistic human likeness of a robot is increased, human attraction to and familiarity with the robot will be increased, but only up to a certain point. After this point, attraction is replaced by fear, unease, or revulsion created by a robot that appears to be, but is not quite, human-like. Eventually, in theory, as the human likeness level keeps increasing, the human perception of the robot will rebound and response to the robot will approach the level of attraction to a healthy person. The area where attraction plummets and is replaced by unease is called the "uncanny valley."

However, some research contested Mori's claims arguing realistic human appearance was not mandatory condition for the uncanny valley phenomenon. In their study with sequences of morphed face images, Seyama and Nagayama (2007) confirmed that the uncanny valley emerged only when there were abnormalities in the face images, such as unbalanced big eye size. Also, the predictions of Mori's uncanny valley was tested in an experiment where a human and his robotic android (Bartneck et al., 2009). They found that there was no difference of the likability between a human and his highly realistic robotic android.

In a case in which an extremely anthropomorphic robot successfully fools our judgmental senses (passing the Turing test (Turing, 1950)), it reaches its highest realism. However, making highly "realistic" entities is not recommended as a goal of creating synthetic characters. Game designer and journalist Clive Thompson (2004) argued that the "Uncanny Valley can make games less engrossing." When people experience a moment of reckoning regarding the identity of an entity they interact with, the level of likability crashes (uncanny valley) and its realism will be reevaluated again based on the new identity. The recent fMRI result of human brain also confirmed the existence of the uncanny valley (Saygin et al., 2012).

3.3 Cognitive Intervention and Reconciliation

The two aspects (automatic reaction and perceptual judgment) of NPC believability are not only interrelated, but also contradict each other. According to the automatic social reaction aspect, human beings tend to respond to a character as a living form even if it doesn't show much perceptual features. On the other hand, they have very accurate

senses for realism judgment. However, these two principles cannot explain a very important aspect of NPC believability: matched expectation. For instance, the two human natures cannot explain the reason why a character with very simple features is often more believable than a character showing many perceptual features. Nowak and Biocca (2003), for example, confirmed that subjects in low-anthropomorphic conditions experience higher telepresence than those in other conditions (high-anthropomorphic and no image condition). Human beings recognize and differentiate objects in a mediated environment differently based on the spatial cues coming from the objects, and different visual cues trigger different images of the objects. Human beings seem to have a system of those images in hierarchical structures.

Schemata is a kind of cognitive network of related thoughts (Slavin, 1988). Similarly, Mandler (1984) described a schema as a unique and harmonious representation. Each individual has many unique schemata depending on his or her experience and cognitive ability. The concept of schema has been used by cognitive scientists and psychologists to study how humans interpret and remember information they encounter in daily life in relation to their previously developed schemata (Duis, 1996; Bartlett, 1932; Ausubel, 1967; Armbruster, 1986). Psychologists Rumelhart and Norman (1978) identified three possible effects of new information on people's existing knowledge structure: accretion, restructuring, and tuning. Accretion occurs when new information fits well into the existing schema. The schema structure remains unchanged as the new information is added. Restructuring happens when a pre-existing schema can't explain new information, and people have to change their schema to accommodate the new information. Tuning effect describes a situation when people use new, somewhat contradictory information to tune or modify an existing schema.

The theory of schema explains how the human brain perceives, interprets, and constructs knowledge of the world. The basic idea is that people remember new information by relating this information to the pre-existing information (schemata). Thus, they use schemata to make sense of the world. Schemata make it possible for human beings to make predictions about their next behaviors. Schemata are not conscious. How human beings store and process information occurs at a subconscious level. However, hints at the schemata people have accumulated through their daily lives can be revealed in various attitudes and behaviors such as stereotypes, social roles, etc. When new information does not fit into the

existing schemata, the new information may not be comprehended correctly or cannot be comprehended at all. People seem to develop, accumulate, and modify schemata throughout their lives, and these schemata prepare them to respond to various life events well. The schemata may be used when they see similar objects in pictures or encounter strange characters in a virtual world. It is expected that people will recognize depiction/representation (objects in mediated communication) in comparatively the same way that they recognize real objects - by relating the representation's visual features to their recognition capacity (schema).

Similarly, the theory of Natural Generativity explains human beings' natural and automatic object recognition capacity in a mediated environment (Schier, 1986; Wollheim and Collection, 1987; Sartwell, 1991). The theory of Natural Generativity assumes that human beings naturally use the same capacity that they use to visually recognize objects in the real world in order to recognize objects in pictures. For instance, if people can recognize cars in the real world, they should be able to recognize cars in pictures in general.

People have an instinctive ability to locate some spatial features (likeness) between objects in film and those in reality, and those spatial features will trigger their capacity to recognize those objects in a film. In other words, people have an automatic and instinctive way of exploiting their visual capacity to recognize an apple in a picture by locating some features in comparison with an apple in reality. Visual cues and features trigger this capacity, and the more people locate spatial features in objects between a picture and reality, the more realistic the object in the picture will be. Currie (1995) argued that the realism people experience when they watch a film illustrates "likeness" doctrine, which claims the experience of watching a movie is like the experience of perceiving the real world. He calls this kind of realism "perceptual realism," trying to explain viewers' capacity to recognize depictions of objects in a film.

The theory of parasocial interaction argues that human being responds to representations of humans in the media in very similar ways to their typical social relationship. Since Horton and Wohl (1956) first introduced it, the concept of parasocial interaction has been studied in the context of mass communication (e.g., McQuail et al., 1972; Levy, 1979). Recently, Giles (2002) proposed a model that accommodates from typical social interaction (ex, face-to-face interaction) to parasocial interaction (ex, cartoon characters). In his model of

parasocial interaction for future research, he argued that the cognitive aspect of parasocial interaction “consists mainly of making judgments about the media figure (person) based on knowledge of that person” (Giles, 2002). According to his new model, the phenomenon of parasocial interaction can occur on the base of the important aspect of NPC believability: matched expectation.

Theories presented above provided common ground for both automatic responses to social cues and perceptual realism. Uncertainty Reduction Theory occurs in a scenario in which people interact with other human beings, and people use a schema in the course of conversation with other human beings. Even in cases in which they encounter highly anthropomorphic entities, people still use a schema in order to interact with them. Schema can also be the reason why the level of realism abruptly increases right after the uncanny valley in Mori’s speculation to a degree that is higher than before the valley. The uncanny valley signifies the moment when people change a schema of the object they interact with, and the representation of the object is enough to believe the object as its new schema.

3.4 NPC Believability

Combining all the aspects of NPC believability presented above, we propose a definition of NPC believability as *“the size and nature of the cognitive gap between the character players experience and the character they expect.”*

When players’ expectations (schema) match their experience, a character is believable. Mismatch between players’ expectation and their experience can be positive or negative. The negative mismatch occurs when players’ experience falls short of their expectation. The larger the gap, the more likely it is to interfere with suspension of disbelief. People don’t feel any surprise (not believable) when they experience either much less than what they expected or what they experience doesn’t match with what they expected. On the contrary, the positive mismatch occurs when either players experience exceeds their expectation. When players experience qualities of NPCs a way beyond their expectation, players need to apply a new schema to understand the character feeling surprise (unbelievable or so believable).

Experience management is an important part of NPC believability, but casting first impression is critical since it will decide the level and the direction of your expectation (schema). The relative and proportional nature of the NPC believability between expectation

and experience is confirmed with other research (e.g. Magerko, 2007).

Our definition includes two instinctive but contradictory human natures: 1) human beings tend to respond socially to a minimal cue of life, 2) but human beings also are very accurate when they evaluate the realism of an entity. In other words, people respond to computer characters in two conflicting ways (automatic reaction to social cues and perceptual realism judgment). People combine these two instincts cognitively (cognitive intervention and reconciliation) to feel believable. NPC believability is human beings’ willingness to overcome the cognitive gap between their expectation and experience.

3.5 Combining All Together

Uncertainty Reduction Theory (URT) explains how human beings interact with strangers based on their schema. Berger and Calabrese (1975) developed URT to explain a role of communication in forming new interpersonal relationships. They borrowed the concept of uncertainty from information science where it was used to describe data transmission between machines (Shannon and Weaver, 1963). According to the URT, uncertainty is unpleasant, and people try to avoid or reduce it when they encounter strangers. Berger and Calabrese proposed three stages of interactions when people encounter strangers: an entry phase, a personal phase, and an exit phase. During the entry phase, people share very basic information, such as sex, age, socioeconomic status, etc. In the personal phase, more personal information will be shared, including attitudes, beliefs, values, etc. During the exit phase, people decide whether they want to continue to have a relationship with the stranger. The three interaction steps may apply to the interaction with a strange computer-generated character as well. When people form impressions of others, they construct mental models of new people based on people they already know (Gordon, 1986). Users of a low bandwidth communication system tend to assume that the distant others are more like them because they don’t have enough information to contradict the assumption, whereas users of a higher bandwidth system can perceive more detail and recognize more differences between themselves and the distant others. High bandwidth reveals differences, whereas low bandwidth carries little information resulting in greater reliance on default schemas (Walther, 1996). People “fill in the blanks” and assume similarly to themselves. Isbister (2006) argued that people respond to computer characters

in a very similar way as they do to face-to-face communication as the URT expects. She recognized the importance of psychological principles such as *agreeableness*, *dominance*, and *personality* in a relation with computer characters. The judgment on computer characters based on the psychological principles occurs quickly, automatically, and accurately.

People first try to apply one of their existing schemata to interpret a character or situation they encounter, and modify or create a new one only if familiar schemata are a poor fit. The NPC believability is intertwined with three sequentially related factors: automatic response to social cues, the level of realism, and schema. First, people basically respond to non-human entities and human beings in a very similar way as the automatic response to social cues explains. They first search the characters to locate some spatial feature, which will trigger their capacity to recognize the characters (schema). Then they quickly evaluate the level of realism of the characters based on the schema obtained. If the characters' features (our perceptual experience) are realistic enough to satisfy our expectation generated by the schema, then they perceive the characters as believable. The level of realism represented by visual cues will decide which schema to trigger, and the schema will be used in evaluating the level of realism in turn. NPC believability rests partly in subconscious processes (fast and automatic) and partly conscious processes (slow, reiterative and cognitively heavy). Based on this cognitive foundation, game players are able to experience "bleed" effect falling in love with NPCs in RPGs (Waern, 2011).

4. CONCLUSION: DESIGNING BELIEVABLE NPCs

The theoretical communication frameworks add new insights and reasoning behind the design and study of believable NPCs. Applying the frameworks one could posit:

- 1) Players' first reaction to an NPC will be to apply an existing schema to understand what to expect and how to interact with the NPC (schema theory).
- 2) If no existing schema fits the situation, players will be forced to construct a new schema. Even so, the new schema will probably be constructed from existing schemas.
- 3) Players are likely to assume the NPC is like them, unless available information contradicts that assumption. When no information is available, we fill in the blanks. When contradictory information is available, we adapt our schema. Doing so takes cognitive effort and can draw someone out of suspension of disbelief.

- 4) Players will react to NPCs who look like player avatars and to NPCs who look like signs. We tend to be very forgiving of forms, assigning the benefit of anthropomorphism even to rocks and disembodied text.
- 5) More detail is not always better. Low detail lets the player fill in the blank. The more an NPC looks but does not act like a player avatar, the more cognitive friction will result.
- 6) People are uncomfortable with ambiguity and uncertainly. They are not sure which schema to call upon. Drawing upon familiar schemas requires less brainpower to understand.

NPC believability is a result of both cognitive and unconscious activities of human beings. Game players perceive believability of NPCs in very subjective ways. The qualities that have been insisted to create believable agents were examined and categorized into five different categories; appearance, personality, goals, emotions, and social relations. However, these believability qualities are not necessary conditions for character believability. Humans require very few cues in order to react socially to a computer (Reeves and Nass, 1996). Also, researchers found that the social presence could be triggered by only minimum intelligence (Biocca et al., 2001). Individual NPC believability quality is not independent: they are inter-related to each other. This is why two different qualities in a NPC don't guarantee doubled-believability. Often, NPC believability can be established mainly by one or few distinct individual qualities. In many cases, perceived NPC believability is less than mathematical sum of each individual believability quality. In other words, an individual believability quality may have a negative effect on the overall NPC believability if it is in conflict with another main principle such as goal or personality. This finding is consistent with what Currie described about human capacity:

it might be a disjunctive capacity: being able to recognize an F might consist in associating a certain list of features a_1, a_2, \dots, a_n with the concept of an F in such a way that detection of the presence of any one of the a_i 's in an object is sufficient to enable you to recognize that object as an F. (Currie, 1995)

Moreover the five qualities may not be a sufficient condition for evoking believability because players experience it subjectively. Even though a NPC satisfies many of the NPC believability

requirements, there is no guarantee that it will be perceived as believable (Bates, 1994; Baillie-De Byl, 2004; Bhatt, 2004). Even an NPC will be perceived as less believable when a game player interacts with it over time or with repeated play.

Time is an important factor in NPC believability building. Certain believability qualities can be perceived faster with less ambiguity than other qualities. For example, the appearance of a computer character is easy to perceive and doesn't require much time or cognitive processing compared to perceiving personality or experiencing social relations. It is not clear how much each individual category contributes to the overall believability of NPCs over time yet. When the interaction between players and NPCs is very short, appearance probably should have a bigger impact on overall believability. Other categories (such as personality) can make more contribution to the overall NPC believability as the interaction unfolds over time.

In a larger scope, the causal relationship between NPC believability and the quality of gameplay will be interesting, even though it was not studied in this research. Good RPGs include many factors including NPC believability. However, it is not clear how it is related to general game evaluation. If there are other factors affecting the game assessment, what are they? Especially in a single-player RPG, NPC believability may be more important than other factors due to the nature of the game. Studies on factors that affect RPG evaluation not only from experts' perception, but also causal game players' perception, will be important in terms of providing guidance to character designers.

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Review: *Playing at the World*

Popular abstract: Jon Peterson's *Playing at the World* is an ambitious history of the early developments of *Dungeons & Dragons*, arguably the first and most popular role-playing game.

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1. INTRODUCTION

Jon Peterson's *Playing at the World* [1] is the most detailed history of the birth period and origins of *Dungeons & Dragons* ever written. It seeks to map out the myriad influences of both game design and fantasy fiction that led to its creation through a humongous amount of background research, intertextual references, and a transmedial viewpoint. Its size is ambitious, and Peterson has been able to draw from a huge number of primary sources, such as fanzines with minuscule circulation numbers. Just having been able to gather most of these sources can be considered a cultural achievement on its own: strictly by the number of primary sources, Peterson's work can be considered a monumental undertaking and if not for some problems, the work can be considered an instant classic and a must-have for anyone doing research on – or just interested in – the birth stages of modern roleplaying.

At 698 pages (counting an inclusive index and a respectable reference list), *Playing at the World* tries to encompass every aspect of the birth stages of *D&D*. However, this ambition is marred by the book's inability to distinguish between facts of major and minor import; these are often blended together with extensive lists of sources and explanations, mangling seemingly minor details into major roles and disguising facts of major importance between those of minor substance. Likewise, as we will discuss below, the text suffers from a selective fact bias, and portions of it need to be taken with a pinch of salt. The book's credibility suffers at points in which certain sources seem to have been privileged over others to construct a specific narrative.

2. THE PRE-HISTORICS OF ROLE-PLAYING

The book's ambition is evident from the first chapter, which provides us with an incredibly vivid presentation on early wargaming and the predecessors of modern *D&D* in the form of fantasy wargaming and *Chainmail*. Unfortunately, the chapter has its weak points whenever Peterson discusses the birth of the medieval setting. The problems are further illuminated in the second chapter on the medieval fantasy genre: the choices

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display omissions and subjectivity that can, due to the amount of references, pass as facts to an unsuspecting reader (detailed below).

Fortunately, the book kicks into full gear in the third chapter on the creation of the ruleset. To track the birth sources of *D&D*, it reaches into the far past for the origins, starting with the first known board games, progressing into the development of *Das Kriegsspiel*, and then tracking the development of wargames in painstaking detail from the late 18th century to the emergence of *Chainmail* and finally *D&D*. Attention is drawn to specific innovations that emerged during this period, when military training simulations spawned the first commercial wargames, with a particularly prolonged aside dedicated to probability as a mathematical discipline. Maps receive their own section, as do specific elements of the combat system, the level progression system, and even dungeon logistics.

In the fourth chapter, the book jumps again into the past to discuss how the playing of the role was born, this time starting with Jakob Moreno's psychodrama, and then covering a variety of activities with elements of role-play during the mid-part of the 20th century. Especially of interest is a discussion on how the early science fiction fandom produced examples of collaborative storytelling and role-play, spawning the Society for Creative Anachronism in 1963. We are also treated to the most complete descriptions of Dave Wesely's seminal series of Braunstein game sessions in print.

In the final chapter, having tracked the different strains of inspiration that led to its birth, the book covers the years 1974-1977 and more or less everything that happened around the game during the time. Through fanzines, magazines and some private letters, Peterson documents the game's reception and spread, the first Gen Cons after release, and further development of the game, such as the emergence of the Thief class. This is also the time when the role-playing game industry began to take form, and the first competitors to Tactical Studies Rules were born. Though the early years of *D&D* are well-trodden ground and largely a matter of historical record, Peterson has managed to unearth a trove of

previously unknown information. Also discussed is Dave Arneson's departure from *D&D*, though Peterson wisely sticks to nonpartisan reporting and eschews the sensationalism easily invited by the topic.

3. AMBITIOUS BUT PROBLEMATIC

Peterson's approach distinguishes his work from countless other studies through simple detail-orientedness: the sheer number of original sources cited in the book is staggering. Ranging from detailed descriptions of the creative processes behind the popular wargames of the 1950's such as *Tactics* to analyzing game adverts in the wargaming magazine *General* in the 1960's, the take on the early history is a jubilee for the detail-minded enthusiasts of early gaming. Including rare gems such as *D&D* inventor Gary Gygax's early wargaming adverts and original hand-drawn Gen Con 1 floor plans, the amount of facts is breathtaking. Unfortunately, this is also where the problem of oversaturation begins. Peterson tends to sidetrack without hesitation, presenting secondary facts and details with gusto, and backtracking once again, giving further details – that are further removed from the topic – without ever stopping to evaluate the importance of the presented information, and leaving the readers with a huge amount of unrelated trivia.

The problem is compounded by the fact that the information provided is not all reliable. For example, the claim "For the purposes of this study, the first notable commercial romance came from Robert Louis Stevenson (1850-1894)." The statement is quite ironic: indeed, "for the purposes of this study" it can be said that Stevenson wrote the "first notable commercial romance," (pp. 85) but in the real world, while Stevenson's *Treasure Island* (1883) and *The Strange Case of Doctor Jekyll and Mister Hyde* (1886) are important and notable, for example Alexandre Dumas' *Les Trois Mousquetaires* (1844) and *Le Comte de Monte-Cristo* (1845-1946) had been notable successes in the field nearly half a century earlier (both were translated into English in 1846). Omissions such as these can be considered simple mistakes, but there remains a lingering suspicion, as Stevenson is included otherwise as the perfect candidate for displaying the closeness of gaming and literary fiction: "Robert Louis Stevenson, author of *The Case of Dr. Jekyll and Mr. Hyde* (1886), was a wargaming pioneer in his own right" (pp. 16) and "As Stevenson wrote the final sections of that famous novel [...] in his life-long struggle against tuberculosis, he played war games in the attic of his chalet" (pp. 86). Quite admirably, the roles of Robert E. Howard's pulp fiction as well as Jack Vance's *Dying Earth*

setting are emphasized. However, a glaring example of the book's cavalier attitude about sources is the recommendation of L. Sprague de Camp's heavily criticized and extremely problematic *Dark Valley Destiny* (1983) as a biography of Robert E. Howard and dismissal of all others as guilty of "hagiographic excess" (pp. 94). Even though not in the primary focus of the book, the recommendation shows a problematic subjectivity in source material selection.

In other similar cases, the reader is left puzzled and bemused: Does the reader have to check every fact without being able to trust any of the provided background? The text feels as if every single idea and tidbit has been included without verification, especially if they fit the idea of finding bridges between gaming and other arts. Such errors, though minor, have the effect of casting doubt on the material that is not trivially verifiable. Though many of the zines used to compile the book are from various university archives, still more are from private collections.

4. CONCLUSIONS

Playing at the World is, without any doubt, the most ambitious project produced on the origins of *Dungeons & Dragons*. Despite the problems discussed earlier, it can be considered a cultural achievement both in its scope and in its attention to detail. For a games scholar or a transmedial academic, the book can be a treasure trove of information – as long as the reader remembers to check all claims and to note whenever there seems to be a gap in information framed by walls of text on other details.

Playing at the World is at its strongest when dissecting specific evolutions within gaming that led to *D&D*. In these sections, even the digressions – such as listing all popular fiction that had had magical sleep spells or lightning bolts – are enjoyable, and the actual meat of the text, including the entire third and fourth chapters on rules mechanics and roles and immersion are a delight to read, certain to provide readers with an abundance of interesting facts and tidbits. It is in these sections that Peterson seems to be at his freest and most comfortable, and the text feels natural and free-flowing – not overcoming the problems of the book but at justifying its position as the most exhaustive treatment of the history of *D&D*.

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