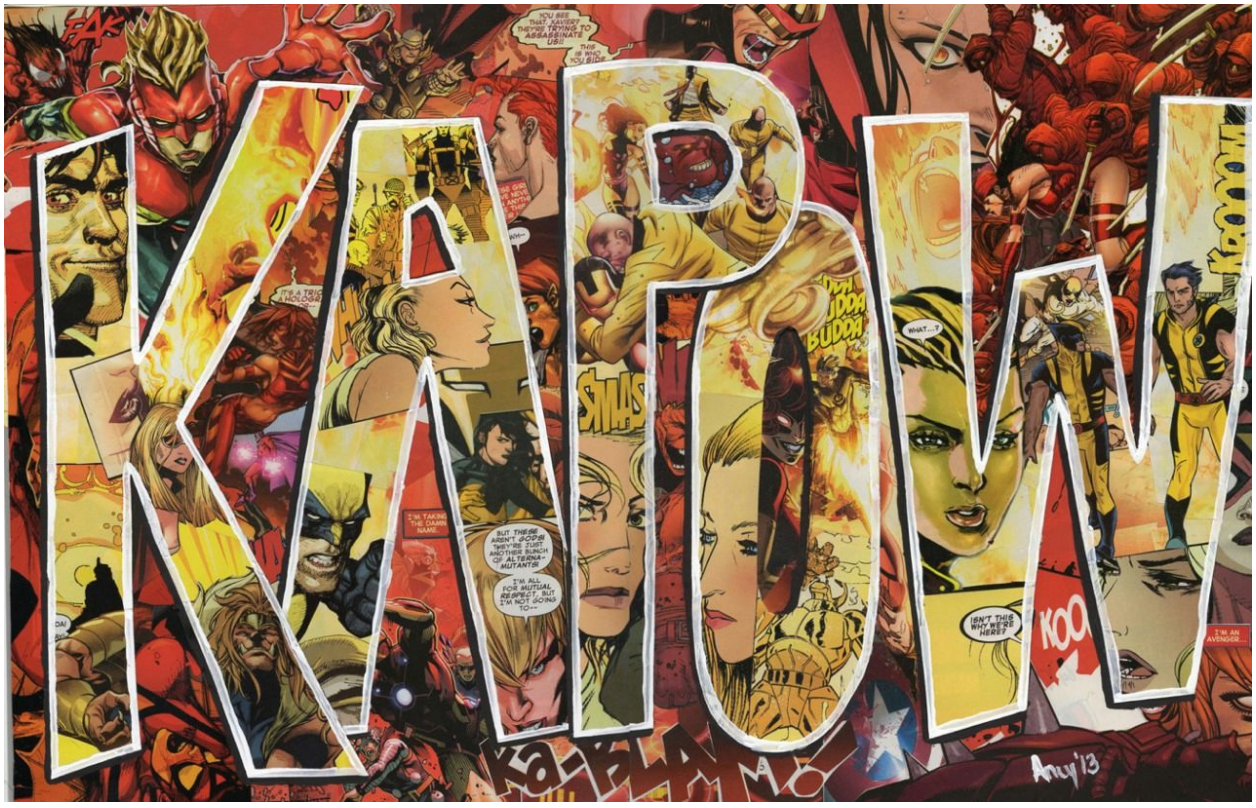

Superherolympics: Developing Cooperation in Multicultural Environments Through Prosocial Gaming

Mariana Duprat and Seth Trudeau

June 10, 2015

ABSTRACT

Third Culture Kids - children growing up outside of the native culture of their families - are by definition faced with situations that require them to renegotiate their identity and social role in relation to others. Collaboration is an oft-cited “21st century skill,” but adolescents encounter a variety of scenarios that call for different skills to collaborate effectively and identify valuable collaborators. A growth mindset toward behavior and personality helps adolescents gain the empathetic skills that allow them to look beyond surface features of potential collaborators, and to see the benefits of differences as well as similarities.

Through the “massive tabletop” game Superherolympics, pre-adolescents in multicultural environments will develop a superhero identity that they will use to complete a series of physical challenges in tandem with a series of different superhero partners.. Their superpowers will provide differential benefits depending on the challenge, and the partners will act in different roles according to both their superhero abilities and their own personal traits.

We will evaluate how users learn to work together effectively with a variety of different people within the game and on novel tasks outside of the game.

CHALLENGE

Needs:

In a multicultural country and a progressively multicultural world, it is important for individuals to learn how to interact and collaborate with people from different backgrounds and cultures and beliefs. This is especially essential for Third Culture Kids (TCKs), children who are growing up negotiating two different cultures, as the culture in which they live is different from the native culture of their families. TCKs are so named because they develop their own unique hybrid culture; in environments rich with TCKs - such as multicultural schools and neighborhoods - each TCK may have identified different aspects of a variety of cultures that they have blended together, consequently they need additional support in identifying modes of interaction and collaboration with others.

Saber is a thirteen-year-old refugee from Somalia, who now lives in the United States. Any given week in his life comes with a dizzying array of social interactions, some quick and superficial but many deep and involved. His neighborhood is socioeconomically diverse but rapidly gentrifying, and because his mother doesn't have the time to supervise Saber, he is frequently out at the local parks and restaurants in a loosely defined social hierarchy with other kids his age, many of whom are first and second generation Latino immigrants. In his interactions he simlultaneously experiences similarities and differences from his home culture: like him: some of his friends come from deeply religious and conservative families, yet his friends are predominantly Catholic, where he is Muslim. He has experienced the chaos and lawlessness of Somalia - a failed state - along with the highly bureaucratic rigidity of a refugee camp along with the structure that accompanies good governance in the United States. In school in particular, identifying which of these modes of being he should latch onto is a challenge;he hasn't figured out how to work well with other students and frequently finds himself isolated from his classmates.

The period of early adolescence presents itself as an especially challenging moment for this integration:

> "The major task facing adolescents is to create a stable identity and become complete and productive adults. Over time, adolescents develop a sense of themselves that transcends the many changes in their experiences and roles. They find their role in society through active searching which leads to discoveries about themselves. The changes experienced during puberty bring new awareness of self and others' reactions to them. " (Perkins, 1997)

This period of changes and discoveries can become very confusing for anyone but especially for TCKs, making it hard to understand how one is being perceived by others, leading also to frequent misjudgement of one's peers. According to Gilovich et al (2000), "people overestimate the extent to which their actions and appearance are noted by others, a phenomenon dubbed the spotlight effect."

TCKs in the late elementary/early middle-school years need to learn how to look beyond themselves and beyond the surface features of their peers, finding the deep similarities and differences, regardless of their background. This will help them in this self-discovery process and in negotiating their social roles.

Competition:

The existing solutions for this problem mostly focus on interventions in formal schooling environments, such as school counseling, or even in the complete reformation of the teaching techniques of specific schools. This is evidenced in growth mindset schools, such as Brainology or in project based ones, such as Quest to Learn. Both show very good results, focused on developing behaviors in individuals and as such are focused on individual activities, rather than social interaction.

The goal of Superherolympics is to create an easily scalable product, independent of official initiatives, offering fun and engaging mechanisms while using the learning theories of successful interventions to inform the design decisions of the provided activities..

LEARNING

Early adolescents who play Superherolympics will develop an **incremental theorist/growth mindset** approach to behavior and personality, both regarding self and others (Levy & Dweck, 1999). As a foundation to that approach, Superherolympians will develop a prosocial attitude within partner & group collaboration in which they will learn to identify their own strengths alongside the strengths of their peers and allow different people to express their strengths in different contexts. Research into prosocial gaming has shown that video games that intentionally expose players to situations that involve positive characteristics such as courage and compassion cause increased empathy in real world situations (Greitemeyer & Osswald, 2010). Additionally, working with partners in real life environments shows increased generation of novel results that exceed the abilities of individuals working alone (Schwartz, 1995).

In order to achieve this collaboration in a new situation, where there may be many unpredictable threatening elements, leading to potential conflicting worldviews, we will also use team building theories to create an experience that leads to acceptance and collaboration. The following are some of the theories that we will be working with:

> “The **jigsaw classroom** is a specific type of group learning experience wherein each student must cooperate with his or her peers to achieve his or her individual goals. Just as in a jigsaw puzzle, each piece--each student's part--is essential for the production and full understanding of the final product. (..)not only a method for student academic improvement, but also as a technique to build empathy and compassion among students and to create a respectful and humane social environment for all children” (Aronson, 2002)
>
> **Contact hypothesis** is a technique used to improve relations among groups that are

experiencing conflict. “If one has the opportunity to communicate with others, they are able to understand and appreciate different points of views involving their way of life. As a result of new appreciation and understanding, prejudice should diminish.” (Whitley, 2010)
“Allport specified four conditions for optimal intergroup contact: equal group status within the situation, common goals, intergroup cooperation and authority support.” (Pettigrew, 1998)

By controlling the environment with the variables described above, we expect to foster collaboration and integration.

DESIGN OF THE LEARNING EXPERIENCE

Approach:

Based on the learning theories described above, we came to some design principles, which informed some key features of the project:

The activity must support self-discovery:

- The interactions will provide a private period of self-declaration and self-discovery before they engage with other participants;
- The activity will take place in a new environment, where the fixed rules of the participant’s world do not apply, making them rethink themselves in a new situation;
- The activity will provide the opportunity for the learners to take on different roles in each context, testing out their own and their peers’ behaviors and actions in each situation; (Aronson, 1979 & 2002)
- The activity will provide a tool for feedback after the activity, reflecting on their own actions as well as their peers’.

The activity must provide support for integration and collaboration:

- The group activities will be made in pairs, with each one taking on a specific role in each task, avoiding power struggles; (Aronson, 2002)
- The group activities will take place in person, providing physical contact; (Pettigrew, 1998)
- The tasks will need both roles to be executed in unison in order to be completed. (Pettigrew, 1998)

The activity must support the recognition of positive deep characteristics:

- The project will use storytelling to create a new environment where the participants will be identified by abilities in this new fantasy world, instead of surface characteristics; (Levine, 2005)
- The storytelling will focus on empowering characters; (Rosenberg, 2013)
- The characters must be generic enough so that the participant can transfer their own deep characteristics to them; (Rosenberg, 2013)
- The assigned roles will put the participants in positions where they will have to either support or understand their partners in order to complete the task.

The activity must provide a safe environment (emotionally, physically and socially):

- There will be clearly stated rules governing the interactions, discouraging aggressive behaviors and harmful criticism; (Pettigrew, 1998)
- There will be mediators ensuring the safety of the participants and helping to guide positive interactions; (Pettigrew, 1998)
- If the activities require physical props and scenarios, they shouldn't have sharp edges, high ledges or any other potentially physically harming characteristics when wielded by young teenagers;
- The platform must be safe from mal-intended adults that could take advantage of the system for criminal or predatorial activity;

Challenges

The activities will provide a new situation for the participants to experience and learn how to deal with. However, they will be held in a safe and reasonably predictable environment, guarded by clear rules and interactions. The participants may learn how to deal with new situations, but they might not transfer this knowledge to unpredictable and unsafe environments that they will surely encounter throughout their lives.

The actual technology involved in the game play will be kept to a minimum as much as is possible. While our initial intent was to create a mobile app, through the process of prototype testing we have come to see that as an optional addition; instead, the primary role of technology is to make Superherolympics open sourced and freely distributed as a digital download that can be printed out and used in low-resource settings. Through our digital presence we also intend to allow users to be able to create content for the game, such as additional superpowers or novel challenges.

The ability to choose superhero powers was also a very intentional choice that was originally based on the broad cross-cultural appeal of superheroes, but its value was solidified by research showing that giving superhuman powers in interactive environments increases prosocial behaviors, particularly empathy (Rosenberg et al, 2013).

EVIDENCE OF SUCCESS

From a usability perspective, our team will begin by developing the partner-based mini games that are at the heart of the Superherolympics experience. One of our design principles is that the games should only be accentuated by the technology, not dependent upon it. From this design principle we began by developing low-resolution analog prototypes of the mini-games and soon realized that translating them into digital versions was unnecessary, marking a shift toward the development of the "massive tabletop" approach. Tabletop games, such as Monopoly or Settlers of Cataan, are intended to be played socially and in-person - both of which were essential design principles of Superherolympics. We have now run the mini-games with groups of eight middle schoolers to ensure that the games are playabale and fun.

To assess the Superherolympians learning, our team has developed two assessments that we have administered alongside the game:

- First, we have done qualitative assessments of student interactions as they are put into dynamic pairs during the game. Using grounded theory and open coding, we have identified conditions for expressing support versus frustration, and we have seen students using their superhero identities as abstracted proxies for discussing personal issues. We are now integrating specific collaborative and cooperative techniques into the storytelling prompts in the game and will continue to use qualitative frameworks to identify how students integrate those techniques into their praxis.
- Second, we are working together with classroom teachers to develop novel partner & group tasks to study how collaborative skills developed in the game transfer to situations outside the game. We are not yet attempting to standardize these tasks into the game because they are dependent on the specific age group and frequently on the classroom curriculum.

SUMMARY AND NEXT STEPS

Superherolympics takes two well-developed concepts in social psychology, growth mindset and prosocial gaming, and designs an in-person “massive tabletop” game space where the two merge together. Our team is most excited about continuing to work with schools and other multicultural learning environments to engage students in building strong collaborative skills. We remain excited about the potential for creating a self-directed, fun approach for pre-adolescents to grow and develop socially. We are particularly excited about running this project both domestically and internationally with at-risk students.

REFERENCES

Aronson, E. (2002). Building empathy, compassion, and achievement in the jigsaw classroom.
Aronson, E., & Bridgeman, D. (1979). Jigsaw groups and the desegregated classroom: In pursuit of common goals. *Personality and Social Psychology Bulletin*, *5*(4), 438-446.

Cohen, E. G., & Lotan, R. A. (1995). Producing equal-status interaction in the heterogeneous classroom. *American Educational Research Journal*, *32*(1), 99-120.

Forsyth, D. (2009). *Group dynamics*. Cengage Learning.

Gilovich, T., Medvec, V. H., & Savitsky, K. (2000). The spotlight effect in social judgment: an egocentric bias in estimates of the salience of one's own actions and appearance. *Journal of personality and social psychology*, *78*(2), 211.

Greitemeyer, T., & Osswald, S. (2010). Effects of prosocial video games on prosocial behavior. *Journal of Personality and Social Psychology*, *98*(2), 211–221.

Harvey, O. J., White, B. J., Hood, W. R., & Sherif, C. W. (1961). *Intergroup conflict and cooperation: The Robbers Cave experiment* (Vol. 10). Norman, OK: University Book Exchange.

Levine, M., Prosser, A., Evans, D., & Reicher, S. (2005). Identity and emergency intervention: How social group membership and inclusiveness of group boundaries shape helping behavior. *Personality and Social Psychology Bulletin*, *31*(4), 443-453.

Levy, S. R., & Dweck, C. S. (1999). The impact of children's static versus dynamic conceptions of people on stereotype formation. *Child Development*, *70*(5), 1163-1180.

Perkins, D. F. (2007). Adolescence : Developmental Tasks 1. *Fact Sheet FCS 2118, University of Florida*, 1–3.

Pettigrew, T. F. (1998). Intergroup contact theory. *Annual review of psychology*, *49*(1), 65-85.

Rosenberg, R. S., Baughman, S. L., & Bailenson, J. N. (2013). Virtual superheroes: Using superpowers in virtual reality to encourage prosocial behavior. *PloS one*, *8*(1), e55003.

Schwartz, D. L. (1995). The Emergence of Abstract Representations in Dyad Problem Solving. Journal of the Learning Sciences, 4, 321–354.

Whitley, B., & Kite, M. (2009). *The psychology of prejudice and discrimination*. Cengage Learning.

APPENDIX A: TIME

(1 page max.)

Milestones and deliverables

Winter quarter	Observe target learners Develop ideas Write proposal
March 20, 2015	Proposal draft submitted to advisor
April 15, 2015	Participants for user testing and learning assessment arranged
May 1, 2015	Low-res learning assessments complete (Bay Area)
May 8, 2015	Low-res prototype studies complete
June 8, 2015	Round 2 learning assessments complete
June 15, 2015	Round 2 prototype design complete
June 29, 2015	Final user testing and learning assessment complete (Rio de Janeiro?)
July 20, 2015	Project logo and video submitted
July 31, 2015	EXPO presentation, demo
August 6, 2015	Draft report submitted
August 13, 2015	Signed Master's Project Form submitted

Time needed to implement project

1. Game Mechanics - 200 hours
2. Interaction Design - 100 hours
3. Prototyping - 90 hours
4. User Testing Tools & User Testing - 85 hours
5. Game Development - 80 hours
6. Graphic Design - 30 hours
7. Assessment Development - 25 hours
8. Video Production - 15 hours
9. Web Design & Development - 15 hours
10. Documentation - 10 hours

APPENDIX B: MONEY

Funds needed to implement project

If you had a small budget to spend, what would you want to use it for? Think about thank-you gifts for testers, consultants, software, supplies. Be creative in thinking about how to leverage limited funds.

Every project **that submits a budget here** will be given a stipend of up to $200 per student to cover those needs. Budgets should be specific enough to show where the funds go, but need not itemize every More funds may be available (apply and wait for approval before spending the funds!).

Item	**Cost**
Developer honorarium	$750
Bay Area travel for user testing	$100

APPENDIX C: PEOPLE

Collaboration (For Team Projects)

Mariana will take the lead on designing interventions, graphic design, and video production.

Seth will take the lead on designing assessments, game development, and documentation.

We will share equal responsibility for designing game mechanics and interaction design, conducting user testing, web development, and prototype development.

We will use Trello to set benchmarks and share information and keep a Google Calendar with deadlines and deliverables.

We will hold weekly meetings throughout winter quarter, and then scale up accordingly throughout the remainder of the project.

Supporters

- Michael St. Clair - Lecturer, Game Design
- Dr. Dan Schwartz - feedback on assessment tools
- Chris Bennett, Game Designer in Residence, Peace Innovation Lab - assistance in designing game mechanics
- Dr. Geoffrey Cohen - help on intervention design
- Alison Darcy - doctoral candidate in psychology
- Dr. Katherine Isbister - game design and human computer interaction researcher, NYU

We would also like to acknowledge the generous support of the Stanford Graduate School of Education and Mr. Reese Duca in making this project possible.