Pathfinder: Developing prototypes towards an engaging game to reduce implicit bias

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Abstract: Educational games have a reputation for being lackluster. Striking a balance between good game mechanics and teaching specific content is something that few have been able to accomplish. In this paper, we will discuss some of the challenges that we faced during the creation of *Pathfinder*, a game funded by a grant from the National Institutes of Health, that aims to decrease implicit biases against underrepresented individuals in academic science, technology, engineering, mathematics, and medicine (STEMM). We will describe three iterations of the game to illustrate how we are working toward balancing content and gameplay with a specific focus on how to make a game about a sensitive social issue fun to play. This is our story of making a little game with big impact, called *Pathfinder*.

Introduction

Pathfinder is a game designed at the Morgridge Institute for Research to reduce implicit biases (i.e. unconscious assumptions that arise from group stereotypes) against underrepresented individuals in academic science, technology, engineering, mathematics, and medicine (STEMM). The game is intended to be played by faculty in these fields on a web platform.

Everyone has implicit biases, but what is interesting about them is that they can be markedly different from ones' personal beliefs. Implicit biases come from stereotypes that we all learn from our culture, and even if one does not consciously endorse them, they may still act on them (Devine, 1989). For example,while most would consciously state that men and women are equally qualified to hold academic positions, our behavior is different when our unconscious beliefs are assessed. Research has shown the majority of us have an easier time associating males with science and females with the liberal arts (Nosek, et al., 2007). We also have an easier time associating males with career and females with family. Similarly, implicit biases extends beyond gender, as studies show that the majority of Americans have more negative implicit associations with African Americans than with Caucasians (Nosek, et al., 2007).

The good news is that researchers have found ways to reduce implicit biases. One strategy involves consciously taking the perspective of someone from a stereotyped group. While this passive technique can be effective, video games, as an interactive medium, could be a more potent approach. For instance, video games that are successful at immersing their players in a constructed world, are also fostering their players to identify and empathize with the main character (Schell, 2008). James Paul Gee (2003) calls this "projected identity." According to Gee, for a player to become immersed in the game, they must connect their real-world identity with a virtual identity that they project into the game character. In Pathfinder, we are attempting to utilize the players' projected identity to address implicit bias, by having players imagine themselves as a young African American man in academic STEMM.

Pathfinder players assume the role of Jamal, a young African American graduate student, on his journey to become a renowned professor. To succeed in the game, players must maintain a diverse academic social network while running a research lab. The research lab gameplay entails collecting crucial research data and securing grants to pursue scientific discoveries. Over the course of the game, players will interact with a diversity of people from academia who can assist Jamal with the ultimate goal of becoming a renowned professor. It is through these social interactions, as a form of roleplay, that Pathfinder simulates real-life bias encounters. By experiencing bias as Jamal, we hope our players will gain tacit knowledge (Gee, 2003), which when combined with various bias reduction strategies demonstrated in the game, will lead our players to incorporate their improved awareness and new skills into their daily lives.

Rapid Prototyping

Rapid prototyping is an approach to game development that can be particularly useful for small development teams or independent game companies because it allows for a succession of small goals to be reached in a short period of time. Rapid prototyping involves the quick development of tangible and usable artifacts so that they may be revised and reiterated. The following is a critical review of some of the

prototypes created during our development process. We will describe three iterations of the game to illustrate how we are working toward balancing content and gameplay, with a specific focus on how to make a game about a sensitive social issue fun to play. For each prototype, we will talk about what worked, what didn't, and what we learned from the experience.

First Prototype

One of our first goals was to make Pathfinder a game that faculty members could relate to. We wanted to create scenarios and characters that were believable and would allow for faculty to develop a projected identity. In order to do this, we put together a group of content experts from various fields within academic STEMM. We met with them regularly to get feedback on the storyline, setting, and characters. The resulting prototype was a game based on managing a research lab in which players dealt with bias situations that arise in the lab. In this game, players evaluated resumes, hired grad students, and submitted to journals. In order to draw attention to implicit bias during game play, the research lab's morale was effected by players' decisions. If players handled an event poorly--for example, they didn't diffuse a situation that stereotyped African Americans--the non-playable characters (NPCs) involved would decrease their performance in the lab. This version of the game successfully introduced bias in an academic setting, but soon faced a series of problems.

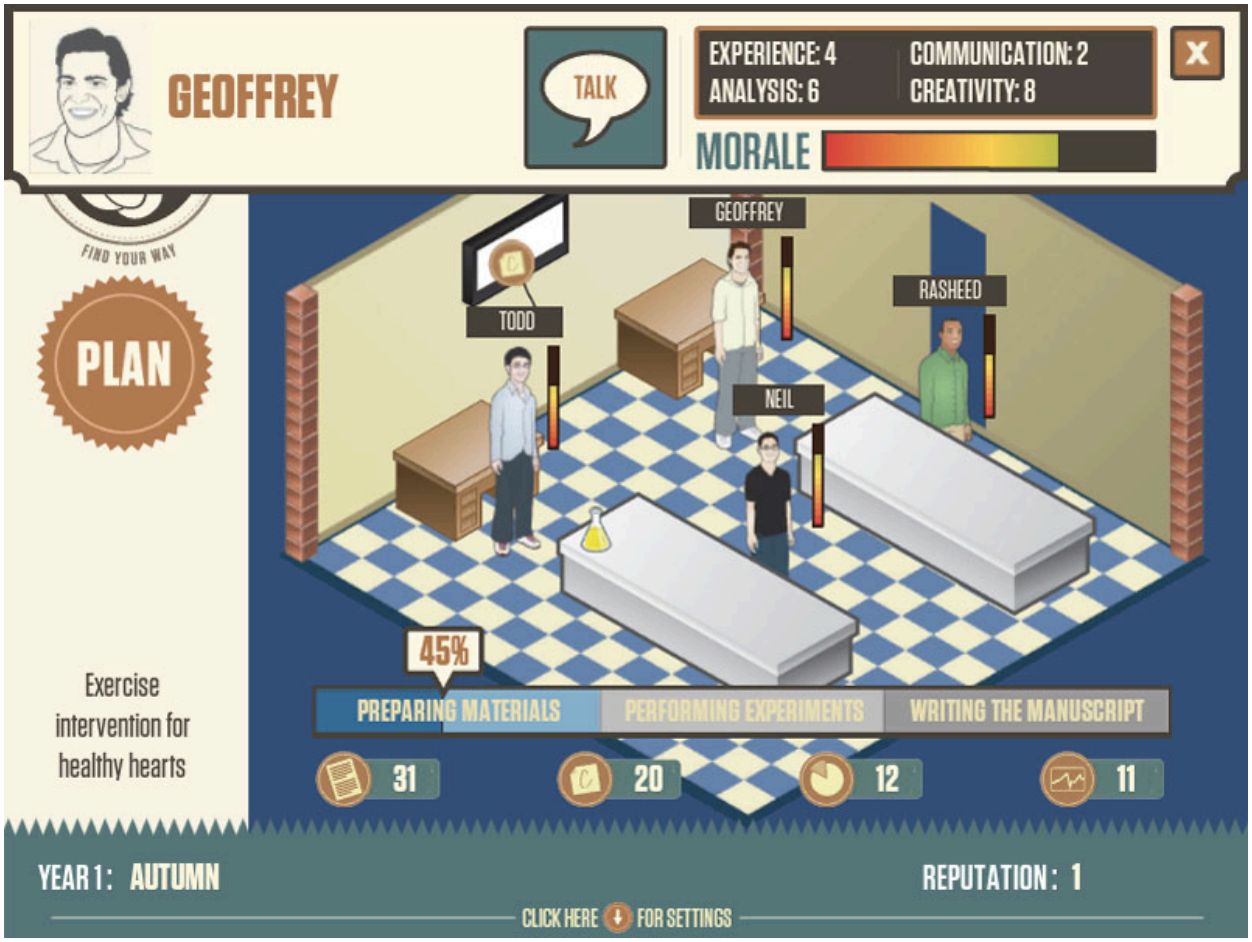

Figure 1: Screenshot of the lab in the first prototype.

One hurdle that we faced was taking for granted that our audience would be accustomed to standard web conventions. Because, for most of us, this was the first time developing for a non-gaming audience, we took for granted features like disabling buttons when they're not need. This resulted in confusion during the playtest that distracted some players to the point that they didn't engage with the game (or the content). We had not anticipated this response, but used this feedback to inform decisions during future iterations in order to make them more accessible (e.g., font size). On the same note, visual feedback was also in need of refinement during this iteration. During the playtest, some players reported that they didn't feel like their decisions affected the game much. This was due partly because the visual indicators were subtle. Even if a decision had dramatic consequences, a playtester who had never played the game before would have no way to determine if their decisions affected the outcome, or if the same outcome would have been

achieved regardless. The lesson learned here was to make sure that visual indicators, whether they are meant to navigate or to indicate the player has done something meaningful, are explicit.

Another problem didn't manifest itself as a problem at first. Because we knew that making our scenario as relatable as possible was important, we took feedback about this very seriously. If our content team felt something wasn't true to academia, or if it was too far-fetched, we modified the game to reflect these ideas. This led to a game that involved applying to several journals, managing undergraduates, writing papers, collecting data, and writing grants. Development in this direction continued until playtesters reported that they felt the purpose of the game was to introduce graduate students to the world of academia, not informing players about bias in an academic setting. We soon realized that we had tried to incorporate all the feedback given to us by the content experts and, as a result, spent more time creating an academic simulator than we did a fun game about bias. This taught us a valuable lesson: keep the goal of the game in mind and seek feedback that helps to emphasize the core experience.

Second Prototype

As game designers, another goal for us was to create a memorable experience for players that would help them understand various forms of implicit bias. Keeping this in mind, for our second prototype, we focused on trying make players feel what it is like to be an African American man in academic STEMM. We wanted them to experience subtle biases and microaggressions as if they were Jamal. As Jamal, we wanted the player to experience biases others may have about them solely due to their skin color. We also wanted them to consider that, in addition to the typical challenges that one faces in academia, individuals from underrepresented groups may also have to overcome the obstacle of implicit bias.

Figure 2: Screenshot of the lab in the second prototype.

Due to the lessons we learned in the previous prototype, we revisited the lab portion of the game and proceeded to make it less of an academic simulation, and more of a time management game with an academic theme. We then focused on emphasizing the implicit bias content of the game. Explicit information about implicit bias was an element that was missing from the first prototype, which again focused on subtlety. Because there is a wealth of information about implicit bias available, the challenge became: How do you convert mounds of text into engaging game content? This resulted in the creation of

a conference portion of the game. Our idea was that we would have a fast-paced time management game act followed by interludes where the main character, Jamal, attends academic conferences and talks to peers. During these interactions, we would introduce the players to implicit biases via conversations with the NPCs. Through playtesting, we soon found the strengths and weaknesses of this approach.

While the conference portion of the game seemed like a great vehicle to deliver content, playtesters found the interactions within the conversations to be lacking. On the one hand, we were able to provide players with the emotional experience we were seeking. Some of the playtesters were genuinely disturbed with the way they were treated in the game by the NPCs and found it unsettling that the content had been generated from real events. On the other hand, players felt that they lacked agency. They thought the game was too didactic and described the interaction as "flat" and "linear." As a result, we have taken steps to make the conversations in our current prototype more interactive while keeping the instances that triggered genuine emotional responses.

Another problem that arose during playtesting was the lack of cohesion between the lab portion of the game, and the conference portion. Playtesters felt as though they were playing two separate games, the "lab game" and the "conference game." This is a very real concern that is often overlooked by developers of educational games. Because we had no clear way to deliver the bias content in the lab portion of the game we had essentially used it as a carrot that led players to the content. Due to the disjointedness of the two portions of the game, players felt that their choices in either portion were not meaningful. A true game doesn't sandbox the content, but instead makes it an integral part of the experience. This cardinal rule of game design was somehow overlooked while trying to fit in all the content we wished to show the player, luckily playtesters held us accountable for the fact that an educational game should be a game. This is perhaps one of the best pieces of feedback we've received from our playtesters and we have taken steps to emphasize this integration in our current build.

The final lesson that we took away from this prototype is to let players determine whether a game is good or not. Although this is not a new lesson to many, it's difficult for designers to remove a good idea that just doesn't seem to work. In our case, we believed that allowing players to play the game first as both a Caucasian graduate student (Geoffrey) and an African American graduate student (Jamal) was appealing, as they would take on the perspective of both Geoffrey and Jamal to compare and contrast their experiences as they progressed through the game. Our hope was that this contrast would highlight biases that might otherwise be overlooked in these situations. When we playtested this, however, we found that the contrasts were not as profound as we had hoped they would be, with the only measurable contribution being more gameplay with content that wasn't unique enough to merit another playthrough. As a result, we cut our losses and focused on Jamal's story which seemed to invoke a strong emotional response from most of the playtesters.

Third Prototype

As we continued further development of the game, our third prototype took into serious consideration the comments that were consistent across most our playtesters, comprised of content experts, members of our target audience (STEMM faculty), and individuals who identified as active gamers. As mentioned previously, a glaring issue that surfaced in our second prototype was that the lab and conference portions of the game felt disjointed to most players. Both Jamal and Geoffrey first began in the lab writing papers then they were shuttled off to a conference where Jamal encountered bias scenarios that Geoffrey didn't. The work that both characters had accomplished in the lab was insignificant during the conference, and their interactions during the conference were useless for advancing in the lab.

Given this feedback and more time to elaborate on the game, we expanded our third prototype in numerous ways. First, we ditched the comparison gameplay, where the game illustrated the differences in Jamal's and Geoffrey's experiences with implicit bias at the conference. Because our playtesters found Jamal's experiences compelling on their own, we removed Geoffrey from the game to focus solely on Jamal's story. This requires players to take the perspective of only one character, allowing them, as Jamal, to build deeper relationships with the NPCs over time.

Figure 3: Screenshot of the lab in the third prototype.

We introduced a handful of new features in our third prototype. The introduction of two more locations (another lab on campus and a department barbecue), as well as four new NPCs (the second prototype only had three), means that Jamal can interact with some of the same NPCs at different locations. This gives players the opportunity to learn more about each NPC over time, giving these NPCs a certain richness and dimension. While playtesters enjoyed the conversations in the second prototype, they found the dialog choices meaningless. For the third prototype, we retained a similar conversation system, but made the choices meaningful by increasing or decreasing stats for certain characteristics (such as friendliness and respect) for each NPC, depending on how players choose to proceed during their interactions with them. We directly tied these NPC stats to the lab portion, where Jamal would gain upgrades or unlocks that will help him perform more efficiently in the lab. This solution is one of the few ways in which we've knit more tightly the two portions of the game.

New locations and new characters called for an in-game system to maintain them. In the lab portion, we incorporated a calendar to keep track of upcoming events (including the conference, lab visit, and barbecue), a map to show the locations where NPCs will visit, and an elaborated social network, SciConnect, where Jamal can maintain his contact list -- those he met at locations. Given these changes so far, Pathfinder, for the first time, begins to feel more like a fuller game for us, rather than an academic simulator (first prototype) or a bias victim simulator (second prototype).

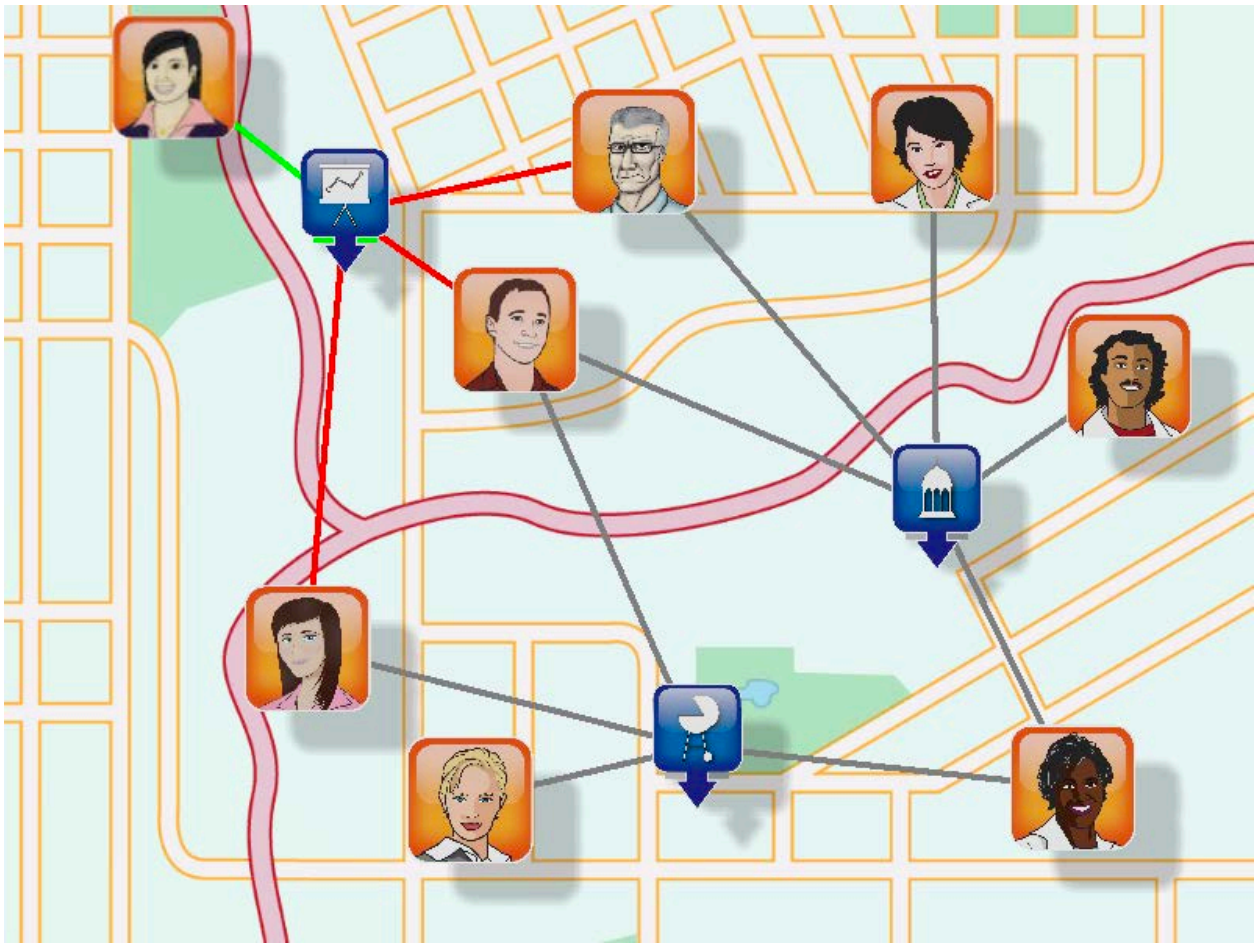

Figure 4: Screenshot of the map in the third prototype.

The challenge of integrating bias content explicitly throughout the game remains – there is a plethora of research on implicit bias, but how can we do all this literature service by showcasing it, and where will it all go? We introduced an almanac in the second prototype that we have kept for this third prototype. High-level, academic text such as detailed descriptions of bias concepts and citations for further reading continue to be relegated to the almanac. However, the almanac has been restructured to show jargon-free descriptions and especially to show game examples as they are encountered by Jamal, to serve as a reminder of players' experiences. Additionally, each NPC is associated with only one implicit bias concept. This one-NPC-to-one-bias ratio is ideal because it allows players to witness the evolution of a bias concept and see how it manifests in different contexts/locations. Recognizing an NPC also means that players recognize a type of bias as well, rather than asking players to remember all the bias concepts across all the NPCs. Whether this gameplay is effective is yet to be determined, as we intend to playtest this prototype in Spring 2012 and, at the same time, begin development on our fourth prototype given our players' feedback.

Conclusion

The cycle of rapid prototyping and playtesting has been a valuable development approach for our team, and has lead us to create a game that is more attuned with for our target audience than ever before. Reaching this stage has been an invaluable experience as we continue to learn the strengths and weakness of video games as a interactive medium. Despite our success, making a fun game that anticipates our audience's reactions while utilizing the latest research remains an ongoing challenge. Through all three prototypes so far, we struggled with balancing gameplay and content.

In this worked example, we discussed at length the challenges we faced in developing each prototype, complicated by some differing, but valuable, feedback from our playtesters. As we work towards a completed product, we intend to produce frequent builds for our team of content experts to assess, pillared by frequent playtests. Additionally, our next steps include running a full research study on a polished version of our third prototype through Spring and Summer 2012.

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