

Problem Statement/Research Question and Background

Autism, as defined by the CDC, is a “developmental disability caused by differences in the brain.” There is very little known about the causes. Autism is a spectrum, and can be characterized by severe challenges in behavioral, emotional, mental and cognitive fronts, or be characterized by simply being different from their neurotypical peers; communicating, interacting, behaving and learning in distinctive ways (CDC).

One point of difficulty for adults with autism is social interaction with peers. Social interaction and participation are indicators of quality of life and overall functioning (Orsmund et al., 2013). Studies have shown that young adults with autism are significantly more likely to be socially isolated, especially if they have lower conversational ability, lower functioning ability and live with parents (Orsmund et al., 2013; Liptak et al., 2011).

Each year, 50,000 children with autism become adults, and many of the support services available to them are taken away (Roux et al., 2013). This resource cliff is characterized by a sharp decrease in products that address the needs of young adults with autism in an age appropriate manner. Often products used for adults with autism can be infantilizing and fail to address the person’s overall happiness and well-being. Based on our interviews with individuals on the spectrum and those who work with them, we learned that making friends and sustaining relationships are persistent challenges faced by individuals with autism. We also heard firsthand how the lack of well-rooted connections can lead to more serious struggles, such as conflicts with roommates or even depression. We created this game to provide a safe context for young adults with autism to practice and improve their social skills and interactions. The mission of the game is to positively impact the quality of their lives of the players far beyond just enjoying playing the game by offering experiences and tools to increase socialization.

Methods/Approach/Solutions Considered

In the first stages of developing a product for our users, we observed a work session in Autistry Studios, a makerspace for individuals with autism aged 12 to 50 years old. There, we met several of the students, watching them build their projects, talking to them about their interests, and joining in on the community lunch, a core component of Autistry’s mission to engage students socially with one another. From this observation at Autistry, we found that the teens in the program had difficulties finding common ground for conversation. They often chose to stare at an electronic screen, be it an iPad or iPhone, scrolling through YouTube and social media when they wanted a break from their work or found themselves bored.

This difficulty with socialization was pervasive throughout many situations and realms of the student’s lives. Brianne, a 21 year old with autism, told us multiple times about her struggle with her roommates. As the only resident in her apartment still in college, she felt that none of her roommates liked her or could relate to her. Speaking with another student, Jonathan, we learned that his favorite room at Autistry was the central room, where students work in a communal space and where the lunch takes place every session, stating “It’s the room where the most people are and I like being around them.”

When determining the type of product that might serve the needs of these individuals, we set out with a few design principles to define our product direction. The

product would need to be physical, and not electronic. It would need to connect people to each other, and not isolate them. Lastly, it would need to be easy to integrate into the lives of our users. Knowing that our users enjoyed the structure and setting of playing board games, we decided to create a physical game to facilitate conversation and social interaction.

The world of therapy and socialization games for individuals with autism is sparse. Most of the board game-like equivalents, such as the “Social Skills Board Games” focused on children with autism, or focused heavily on very directly teaching students a skill through rote drills and practice. When looking at board games for adults in autism, the options are even more limited. Many educators and therapists depend on current popular board games with added rules or alterations to work with their students with autism. For instance, games such as Monopoly and Trivial Pursuit may be played, but in ways where many of the rules are bent or changed to facilitate a more straightforward and engaging experience with the board game for the young adult with autism.

Before we started designing the game, we met with more young adults with autism to better understand how they wanted to socialize. We found the next three game testers through the Autism Self-Advocacy Network (ASAN) in the Bay Area. Three young women introduced us to the concept of “monologuing”, or, taking turns speaking about their passions together as a way to bond and express their care for each other.

We took this idea of “monologuing” about one’s passion and put it at the center of our initial game prototype as the entry point to motivate our users to play the game. Monologuing allows each player to be able to talk freely about their passion, and connecting one’s passion to the passion of another player is how the game allows players to relate to each other.

In our initial prototype, gameplay followed the format below:

- 2 players can play at a time
- Each player begins at the spot on one end of the board
- Each fills the blank sticky note by writing in the subject they are most passionate about or interested in
- Both players take turns answering one of the questions on the board using the topic they put down (sample question, “What do you consider to be the biggest revolution in the past 100 years in your area of interest?”)
- Both players must come up with a connection between their two answers
- The players proceed to answer the remaining 3 questions in the same format
- Then the players must come up with a connection between the 4 connections they have already formed to arrive at a single connection in the middle of the board that relates their interests or passions in a silly, profound or maybe a mundane way

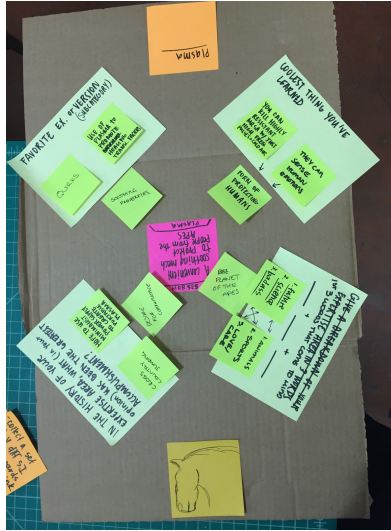


Figure IV. Prototype I.

Image of first prototype made from cardboard, sticky notes, and markers. The sticky notes are arranged in a diamond surrounding one bright pink sticky note in the center. There is one yellow note on the far left side of the board with a drawing of a horse. There is also an orange note on the far right side with the word “plasma” written on it. The rest of the notes are illegible but contain questions and responses in the game.

The goal of this two-player game was to help players discover similarities between initially disparate subjects, a skill that, if practiced, can help adults with autism monologue together in conversations outside of the game context.

While some users enjoyed talking about their interests and using this game to connect their interests to that of others, they also told us they would rather be able to play it as a multiplayer game. Playing the game with just two people felt too much like a “forced conversation.” Additionally, when we expanded our testing to nine Project SEARCH interns, we found that the game’s dependency on an area of interest or passion impeded some students from feeling comfortable playing it.

After testing with users, we took notes during gameplay and asked players and teachers what they liked, what they did not like, and what they would change about the game. Seeing as we created a low-resolution prototype, our users had no reservations giving us many points of feedback on the game and its structure.

Key Points of Feedback:

- Offer workarounds or alternate version so that individuals who do not know what to choose for their passion or deep personal interest can still play the game
- Establish an end goal of the game to motivate players
- Incorporate more players into the game
- Keep the “monologuing” idea in the game to compel players to buy and play the game
- Ensure the aesthetics and physical design accommodate the sensory sensitivities of individuals with autism (through color, texture, and sounds)

After significant changes to the game, we created a second prototype that preserved the “monologuing” element of the game, but lent more structure to game progression and to player interaction based on the type of card drawn. Each turn, a player would draw a card from one of four decks -- solo, partner, team or challenge.

This time when testing the prototype with users, gameplay ran more smoothly. The conversation flowed as the sand timer counted down and a sense of purpose motivated the game testers to play to the finish even after our testing session had ended. After bringing the game to a few other individuals with autism, we discovered that this version of the game prompted more varied and unique conversations than the original game had. The types of questions and activities on the cards not only allowed players practice their socialization skills, but also to leave the game having learned at least one new thing about each person playing.

With the game structure set, we next focused our attention on incorporating sensory appeal based on our users' sensitivities and preferences. From user feedback, we heard that certain colors carried strong emotional association (i.e. anger for the color red). We selected six colors and checked with our forty game testers to ensure these colors felt neutral to them. Lastly, we considered tactile and auditory sensitivities, including preservation of personal space and avoiding loud noises, when writing the game card questions and activities.

Description of Final Approach and Design

Our final design is a conversation based board game that encourages players to learn about each other through activities that spur sharing and interaction. The game focuses on question and activity cards. These cards are divided into 4 categories of social interaction; Solo, Partner, Team, and Challenge. Partner, Team, and Challenge cards encourage players to work together to complete the game, while Solo cards offer each player the opportunity to share their personal interests and opinions with the group.

ME, MYSELF, & YOU

HOW TO PLAY

GAME PARTS

Your game comes with ...

- 1 Board
- 1 Spinner
- 1 Sand Timer
- 16 Skip Cards
- 8 Player Pieces
- 52 Cards

SET UP

- Place the board on the table
- Shuffle the cards and place them face down in the DRAW space on the board
- Give each player 2 SKIP cards
- Pick a player piece
- Let's Play!

RULES

Each player should...

- Tell the other players if they go over the time limit on questions
- Ask the group for help to answer questions that you have trouble with
- Respect personal boundaries

THE CARDS

solo	Set the timer and answer this card by yourself before the time runs out
partner	Spin to find your partner, complete the card with this partner to move ahead
team	All players have to complete this card with you for you to move ahead
challenge	This card is also for all players to complete together for you to move ahead
skip	Use this to skip a question you don't want to answer. Can only be used once.

INSTRUCTIONS

- Starting with the oldest player (if they don't want to go first, pick a volunteer), move clockwise around the circle taking turns drawing cards from the pile
- When it's your turn, draw a card from the pile. Complete the activity or answer the question, then move your player piece to the matching color tile on the board.
Only the player who drew the card gets to move their player piece, even if the card is for partner, team or challenge
If another player is already on the tile that matches your card color, skip that tile and go to the next available tile that matches your card color
If you don't want to answer the question or do the activity, you can use your skip card. You only have 2 of these per game. Once you use a skip, you can not use it again, so choose your skips wisely!
- Continue drawing cards until you get to the last tile. Each player has to reach the last tile to complete the final challenge
- To end the game and win, each player must say 1 thing they learned about the person to their right while playing this game

Figure 6. MMY Instruction Card

Photograph of the MMY instruction sheet (included in each game) that explains how to set up the game, how to play, and directions for how to answer each of the different categories of cards.

For the player to progress through the game, they must choose a card at random, complete the challenge on the card, and move to the corresponding color space on the board. As players draw cards and complete the challenges, they help each other advance along the colored tiles towards the finish. A sand timer is used to help pace the game and ensure "monologuing" is limited to one minute or less. The game format is collaborative; all players must reach the finish and work together on the last space to win.

One concern mentioned by educators and care takers was the problem of players getting stuck on a question that is too challenging or that they are not comfortable

answering. They have often encountered this when they play traditional board games with the students. Getting stuck can be an incredibly frustrating for the individuals, and can cause them to shut down and stop playing with the group. To address this concern, we give each player two skip cards for a question they don't want to answer, and are otherwise encourage them to ask their peers for help when they get stuck.

The primary goal of MMY is to encourage players to work together and learn about each other. In order to reach the finish, all players must progress to the end of the game board and say one thing they learned about another one of the other players during the course of the game, resulting in a collaborative, group win. This format provides the game with a sense of progress as players move toward the finish, but continues to reinforce teamwork and collaboration as every player must reach the end in order for the players to complete the game.

Outcome (Results of any outcomes testing and/or user feedback)

We tested Me, Myself, & You with 40 adults with autism at local organizations, including Foothill College's Disability Resource Center, Shire House Independent Living Center, and the Palo Alto Unified School District's Project Search Program. The adults with autism who tested the game and provided feedback did not want to have their photos shared publicly in any form, hence the lack of photographs of users in this report.

Bonding through experience

With each testing session we continued to iterate on the game design, building off user feedback. Our final design has been positively received by both players and the facilitators we have been working with. In particular, playing the game with the Project Search interns in their weekly social meetings revealed that after playing the game a couple weeks in a row, the interns started to listen and respond more to the answers and activities that cropped up in the game. When one student, George drew a partner card that told him to stick his shoe to his partners' make up a love story with the shoes as the main characters. George's partner, Travis, shook his head side to side, retorting, "Man, that's crazy." However, George was persistent and demonstrated to Travis that they could stick their shoes together without taking them off. The card's activity brought the two users physically (because of their shoes) and socially closer together through this challenge. We also loved seeing players in the Project Search Program help each other complete our tongue twister Challenge Card. This card has consistently been considered one of the most challenging cards in the deck, so we were so excited to see the students at Project Search support each other as they took turns reading the tongue twister aloud.

Sharing new information

At the user testing session at Foothill College, we observed that the game questions prompted users who did not know each other previously to open up more readily to each other. One student, Jane, shared a secret handshake she always does with her brother at home. The other students in the game then asked about her brother. Without this game, in the first week of class, these students likely would not have learned that Jane had a brother. Perhaps, they would have learned this information later in the year or maybe not at all.

Collaboration

Another result we observed at Foothill college was the eagerness with which game tester, Anna, explained the rules of the game to another more timid student, Felipe. Felipe was nervous to go first, but Anna and the other players accommodated his request

to go last. They helped him work up the courage to go at end of the first round and stepped him through the instructions.

Overall Design

When one game tester at Foothill College asked where she could buy the game to play at home, we knew we had succeeded in making the game design look like a real product. She didn't realize the game she was playing was just our handmade, final prototype. This comment also demonstrated she would play the game at home with her family and friends.

Cost (Cost to produce and expected pricing)

Current market pricing of similar social skill building games ranges from \$30-\$45 depending on the complexity of the build and the materials used. Our game currently costs \$20.04 to manufacture, not including packaging and shipping.

Cost Breakdown Per Set:

- Box: \$4.69
- Board: \$4.00
- Spinner: \$1.96
- Sand Timer: \$0.75
- Card Deck: \$9.00

Based on research of comparable games on the market and current cost estimates, we predict the game price at \$35 per set. Each set includes the box, board, instruction sheet, playing pieces, sand timer, spinner, and 52 playing cards.

Significance

The importance of putting this game into the world is to provide a socialization tool and opportunities for young adults with autism as they transition from youth to adulthood. The game creates an avenue for our users to develop social skills in a safe and engaging environment. The game also builds emotional connections between players, which has been shown to promote greater overall happiness in life. One way the game does this is with the partner cards where two players engage in an activity or question sharing this common experience like when George and Travis invented a way to stick their shoes together. The collaborative finish at the end of the game also fortifies these connections by requiring players to remember one answer that another player shared in the game! The gameplay is regimented so players know the structure to expect; however, the unpredictable nature of the questions and activities keeps the game fresh and interesting.

From user tests, the game has encouraged our users to take risks and to connect with others in ways they may not do in an everyday context. Players get to know each other, and they develop a sense of community that extends beyond the game context. After playing Me, Myself, and You, we expect users will gain the confidence and skills to interact with others who may not share their interests or life experiences.

By increasing the well-being and social independence of young adults with autism, our game also impacts the parents and families of these individuals. Parents are able to transition their child into independence with less anxiety and greater confidence that their child will flourish. Although, the game is not for sale yet, we have already had several parents and organizations express interest in purchasing the game for use within their home or organization.

Acknowledgements

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