

Expectations and Outcomes in Players of the Mobile Self-Discovery App, *Shadow's Edge*

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“Hey Siri, I am angry. Really angry. Can you help?”. When you ask an iPhone this question, as one participant in this research study did, the avatar, Siri, returns the advice, “I’m sorry you are going through this. Take a break and find something that makes you smile.”

In fact, it’s not bad advice, but what if a teenager’s anger feels so big that even Siri can’t make them smile right now? Because the prefrontal cortex of the teen brain is not yet fully formed, it is difficult for young people to look beyond their present state to imagine their future selves, or, in fact, to introspect about past experiences. This means that many teens feel trapped in the present such that an experience of anger or depression or anxiety or other challenging emotions in the present may make it impossible for a teen to see themselves as feeling anything but these negative emotions in the future.

To successfully pass through this inevitable stage of human development, many teens need support. One participant in the current research summed this up, noting the need to, “Process anger and build it into something positive versus [keeping it] stuck in your head and staying angry.”

Unfortunately, many teens lack access to traditional modes of support through family and peer interactions or through work with professionals (due to lack of resources, scheduling and transportation concerns, the stigma of seeking help, and more). With this recognized need for emotional health support, many technology, healthcare and mental health organizations have experimented with mental and emotional health applications, resulting in products meant to increase coping skills such as mindfulness and meditation to treat conditions including depression, anxiety and PTSD. For example, the app *Calm* provides guided breathing and relaxation exercises to accompany meditation, with the companion *Calm Kids* offering support for younger users. Similarly, companies are leveraging wearable technologies such as smartwatches or activity-monitoring devices such as FitBit to promote movement and healthy sleep patterns (e.g., Whoop, Withings, etc.), and wearables such as TouchPoints offer stimulation meant to decrease stress. However, very few of these apps are “game-ified” in a way that makes teens want to interact with the platform for the long term.

The goal of the mobile app *Shadow's Edge* is to provide this needed support in a form accessible to and preferred by teens. Very basically, the app, which is made free through philanthropy for download at the App Store and Google Play, uses art and journaling to guide users through stages of Disruption, Disillusionment and Discovery as they work through life challenges. Now the current research seeks to create a preliminary understanding of outcomes associated with *Shadow's Edge* gameplay.

The study used semi-structured interviews to speak with 25 young people ages 13-25 during the time period 24 July 2020 to 17 December 2020 about their gameplay experience, focusing on how gameplay affected their emotional lives, offline. Players found the game either through therapist recommendation through browsing the app store. Players reported dealing with depression, anxiety, social anxiety, autism or were exploring their identity or gender related topics. 25% of research participants had a history of childhood cancer. The methodology of Grounded Theory was used to discover “meaning units” from interview transcripts, describing the emergence of shared themes or experiences.

Overall, the interview-based research reaffirmed that many young people feel stuck in the “now” of challenges including depression, anxiety, gender identity and loneliness. However, this also presents an opportunity: Due to the influence of the prefrontal cortex leading young people to live largely in the present, each moment is a chance to chart a new path.

Throughout this project, teens expressed the desire to understand their experiences as a way to move forward. They were hungry for change and support, and were motivated to explore tools to help them progress. As one participant said, “Getting stuck isn’t healthy. You need to find a positive outlet so you can process your emotions.” For many of these teens, the world of *Shadow’s Edge* provided this outlet.

Key Findings

Mental/Emotional Health Support: Teens in this study overwhelmingly expressed their need for supportive tools and their frustration with the lack of tools or lack of access to tools to support emotional health. Participants also spoke about the ways in which *Shadow’s Edge* offered this support (e.g. “SE really gives me that benefit factor of like being able to be in tune with my emotions and express myself in new ways”). Participants’ ideas coalesced into the following categories: Expression, Reflection, Processing Emotions, Mental Health Knowledge/Facts, Mindfulness, Support Around Transitions and Escape. Figure 1 presents participants’ sample interview material coded as per these categories.

Gameplay Preferences: Participants were overwhelmingly drawn to the introspective writing activities embedded in the app, and expressed their appreciation for unexpected and/or surprising game features, including pigeons that offer wisdom and other non-expected interactive features. Consensus for possible areas of improvement include increased ability to monitor and track progress toward goals and a more individualized experience in which self-discovery content is tailored to players’ personal needs and goals. Additionally, participants identified an opportunity to augment the app’s educational function, stating their preference for more mental-health related information and knowledge.

Why is this research relevant: The Teen Brain is a Work in Progress

Especially in teens and young adults, there is a significant difference in influence between their powerful and highly sensitive emotions and their ability to make mature decisions. In large part, this is driven by brain development. The brain structure known as the amygdala drives emotions and emotional responses, and while the amygdala is fully formed in young people, its natural balance, the prefrontal cortex, is not fully formed until age 25. The prefrontal cortex is the home of *executive function*, which includes the ability to see oneself in the future and thus make decisions informed not only by present conditions, but by how these decisions will influence the future self.

“Because the prefrontal cortex is still developing, teenagers might rely on a part of the brain called the amygdala to make decisions and solve problems more than adults do. The amygdala is associated with emotions, impulses, aggression and instinctive behaviour,” writes the Center for Adolescent Health.

In other words, teenagers *feel* deeply and *reason* more superficially, with the rational part of their brain a big step behind the impulsive part, leading teens to make most of their decisions based on emotions and instincts.

This push and pull between feeling and thinking was obvious in the current research, with teens and young adults reporting primarily their experiences of the present, for example current and immediate feelings of anxiety, depression and confusion; but at the same time, the research also shows the *desire* of these young people to move toward a more mature understanding of their decisions, actions and emotions.

Overall, it was as if research participants were trapped in the present but wanted to move through that stage to create more mature future selves. Interacting with the Shadow’s Edge app provided guidance for self discovery as well as an outlet for expressing difficult emotions.

Conclusion and Future Directions

The current research demonstrated that participants recognized their need for mental health support, identified the difficulty in finding this support in existing systems, and found significant benefit in the support provided by *Shadow’s Edge* (see Figure 1). Additionally, the support provided by Shadow’s Edge is multifaceted, with participants pointing to a range of coping strategies guided by the app, allowing teens to take from the experience strategies that are individualized to their needs, goals and preferences. For example, some teens preferred the simple distraction of escape into a virtual world, while others preferred the guided growth of self-discovery. These expressions of benefit from *Shadow’s Edge* gameplay suggest the app could be a useful tool to support teen mental health either in an independent setting or between sessions with a mental health professional.

The project also highlights the need for additional research to further describe the lived experience of teens undergoing emotional and mental health challenges, exploring important

questions such as the prevalence or lack of support, the current strategies teens use to manage mental health, and opportunities to augment mental and emotional health support in ways that are both effective and practical for use.

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Figure 1: Categories and sample codes from participant interviews

Category: How SE Gameplay Influences Players' Lives

- a) "I like writing about my treatment because now when the topic comes up it doesn't bother me so much"
- b) "The game helps me see my potential"
- c) "I have found myself expressing myself more in my everyday life"
- d) "I have found myself journaling more often"
- e) "SE has helped me find ways to express myself and connect with people in different ways who have different viewpoints"
- f) "SE really gives me that benefit factor of like being able to be in tune with my emotions and express myself in new ways"
- g) "Now when I am really upset with my parents I write them a letter to tell them how I am feeling"

Categories: Areas of Mental Health growth supported by SE Gameplay

A) Expression

- a) "I have selective mutism so sometimes I literally have to rely on writing to communicate"
- b) "I write about many difficulties and stuff I am facing at the time. Writing helps me get out of my head"
- c) "I basically write until everything is out of my brain"
- d) "SE is a really unique way of getting kids to open up. Kids just don't often open up about anything they have been through."
- e) "SE is kind of like my own way of just letting my feelings out and knowing that it is secured and protected within the game"
- f) "SE is a game that shows you how to open up and talk about what you have been through"
- g) "Some of the statements/journal questions make me think, God that's so true"
- h) "I really like the questions, they get people thinking"
- i) "SE really gives me that benefit factor of like being able to be in tune with my emotions and express myself in new ways"

B) Reflection

- a) "I like reading back through my writing to help me solve my challenges"
- b) "Sometimes I just reread my journal to think about what I was thinking about during that time. It kind of helps me with like any bumps in the road."

- c) "Reflecting on my life is something I do quite often in my everyday life. It helps me not feel stuck and get in a really bad depression."
 - d) "Reflecting on my life is something I do quite often in my everyday life. It helps me not feel stuck and get in a really bad depression"
- C) Processing Emotions
- a) "SE really helps kids like me process everything they've been through"
 - b) "Process anger and build it into something positive vs stuck in your head and stay angry"
 - c) "The prompts cause me to think about things from a different perspective"
 - d) "Getting stuck isn't healthy. You need to find a positive outlet so you can process the emotion"
 - e) "Tools and ideas to help process stuff"
- D) Mental health knowledge/ facts
- a) "Need to know how your brain works and what happens when bad stuff happens. That knowledge helps your process and not get stuck."
 - b) "My favorite part is the pigeon part because you learn things you can do about your mental health"
 - c) "I like the knowledge aspect-- I think it is really helpful. Especially in small bits."
 - d) "I really like the pigeons because of the words of wisdom"
 - e) "I like the automated stuff that I can learn from"
- E) Mindfulness
- a) "Take a second and be by yourself to figure out what you need and what you're feeling"
 - b) "I think mindfulness is important, like recognizing being angry"
 - c) "I think mindfulness is really important"
- A) Support around transitions
- a) "At a crossroads and you're not sure what to do"
 - b) "What steps can I use to make big decisions"
 - c) "Support because covid put transitions/plans on hold"
 - d) "As we transition from "the matrix" feeling of everything on zoom to in person"
 - e) "When I am trying to build a new habit or new skill I feel overwhelmed"
- B) Escape
- a) Helps me escape into a new world