Using Twine as a Therapeutic Writing Tool for Creating Serious Games

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Abstract. Serious games are understood as games that have a purpose beyond entertainment, and are designed for the educational or behavior-change benefit of those who play them. However, the creation of text-based, choice-driven games presents an opportunity for therapeutic narratives that benefit the game authors as well as potential players. Although the benefits of storytelling for therapy has been previously established, these narratives were often linear in nature; the software program, Twine, enables technologically non-savvy authors to write branching narratives with multiple choices, creating an opportunity for an enhanced experience of cathartic storytelling. This paper includes a brief description of writing therapy models, including cognitive behavioral writing therapy (CWBT) and trauma-focused cognitive behavioral therapy (TF-CBT), and how the thinking involved with creating choice-based narratives mimics those processes. Then, it moves into a brief introduction of Twine and how it is used to create non-linear narratives. Following that, the paper presents three self-reported cases of authors who have experienced catharsis and wellbeing benefits via the use of interactive storytelling with Twine, and how the creation of choice-based narratives enhanced this wellbeing experience. Finally, the paper presents advantages for introducing Twine in a formal therapy process, and practical considerations in doing so.

Keywords: Choice · Narrative · Catharsis · Therapy · Writing · Cognitive behavioral therapy

1 Introduction

Storytelling has been used throughout history to convey information as well as express thought and emotion. However, writing also has a dual therapeutic purpose. One therapeutic purpose is to provoke understanding or catharsis within the reader, while the other provokes a similar response in the writer. Dan McAdams [7] has proposed that people use narrative to express and form identity, and that one can ascertain who they are based on the stories they choose to tell. Furthermore, writing therapy is used successfully to treat both post-traumatic stress disorder and depression, and has been found comparable with other forms of cognitive behavioral therapy in adults [17] and children [16].

Writing therapy rests within cognitive behavioral therapy, and can be presented on its own with cognitive behavioral writing therapy (CWBT) [16], or as part of a larger

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framework, such as the trauma narrative in trauma-focused cognitive behavioral therapy (TF-CBT) [3]. The forms of writing therapy generally involve four steps: (1) writing a story about one's experiences or fears, (2) expanding that story until it is fully detailed, (3) using that story to converse with a therapist and reframe the experience in order to find more effective ways of coping, and finally, (4) sharing that story with others as a sign of completion [16]. This treatment mimics other post-traumatic stress therapies in that it involves exposure, education, cognitive restructuring, and social sharing [16, 17].

Traditionally, these identity-building and therapeutic approaches to writing involved the author conveying a linear story about their experience [14, 15]. However, with the advent of Twine, an interactive narrative writing tool (described further in the next section), authors can easily create branching narratives that once required the aid of a programmer. This has the ability to expand the arenas of narrative identity formation and writing therapy, and possibly allow people to move more efficiently from catharsis to coping. Branching narratives are an innovative way for people to not only write a story and to experience the self-validation of having written their truths, but also to write alternative routes that could be taken should they encounter a similar trauma in the future. These alternative routes can be actions that they can take, or simply educational routes that they can use to help others understand their experiences. The use of variables within Twine expand the branching narratives into fully-fledged games, allowing players to discover how well they are coping by providing reactions to player choices in the form of narrative expansion or the use of a scoring system.

The three works discussed within this paper represent three cases of Twine narratives having provided self-reported cathartic, therapeutic experiences for the authors by allowing them to express themselves and to educate others. While the term "catharsis" was coined by Aristotle as a literary device, in this paper, we refer to Moreno's [9] definition of catharsis in psychodrama, which defines catharsis as a healing and liberation that results in a dual effect: firstly within the author of a work and secondly within the audience. Although these works are not the result of therapy sessions, they provide insights into the potential use of Twine as a tool for writing therapy. These works explore topics such as domestic violence [14], coping with chronic health conditions [2], and understanding queer identities [4]. Each of these works takes the approach of putting the player in the position of authority. They are all written in second-person, referring to the player as "you" and inviting them to experience the life of the traumatized person. For players who have experienced a similar trauma, this can extend the author's catharsis to the player. For others, the experience can induce empathy along with education.

2 Use of Twine

Twine is a free, browser-based writing tool (found at http://twinery.org) [15] that is designed to allow authors to create interactive narratives with very little programming. It uses simple script and a flowchart-type interface to connect passages of text, and publishes the output as an interactive web page. Although both the authoring tool and output require a browser, an active internet is not required after the initial download of

the program. The tool is very easy to use, comparable to regular word processing software. Based on the experience of the authors both in learning Twine and teaching it, the program takes about 20 min to learn for ages 10 and up. This includes creating and linking passages to each other to create a story, and including graphics and sound. For more extensive works, users can visit the Twine webpage to find custom templates to change the visual style of their stories, discover more advanced ways of using Twine's simple programming language, or learn HTML, CSS and Javascript in order to add features not available within Twine's core interface.

The potential benefit of using Twine for writing therapy is that it allows clients and therapists to explore various responses and outcomes to one scenario through the use of branching narratives, or choices. Clients and therapists may be unfamiliar with the term "branching narrative", so the term "choice-based narrative" may be preferable within a therapeutic context. Creating "choices" within Twine is simple. Each section of a story within Twine is referred to as a "passage" and contained within its own box (Fig. 1); within a passage, you can put the name of another passage in square brackets to create a link to that passage. Placing multiple links in one passage creates branches or choices that the reader—and also the writer—can make. These branches can be as complex as a writer desires or is capable of producing, with simple narratives being just as potentially effective in producing a therapeutic benefit. While images and audio are not necessary for the creation of a therapeutic Twine narrative, these features can be easily added to passages in Twine (Table 1) Once the Twine story is created, a publish button creates a self-contained HTML file that can be opened and played directly in a browser.

Some of the writing techniques discussed in this paper—such as second-person perspective and looping narration—have a desired impact of fostering empathy in a player, but it is unnecessary for writers using Twine to use techniques that deliberately attempt to evoke a particular emotion in their readers, or for writers to even create Twine narratives with a particular audience beyond themselves in mind. While the authors of the works within this case study chose to publish their final creations for public consumption, any potential positive impact on readers was secondary to the primary cathartic purpose of their creation for the creator. It is not necessary for a game to be hosted publicly after its creation unless this is a recommendation as part of ongoing therapy or a personal desire to share a journey with a wider audience.

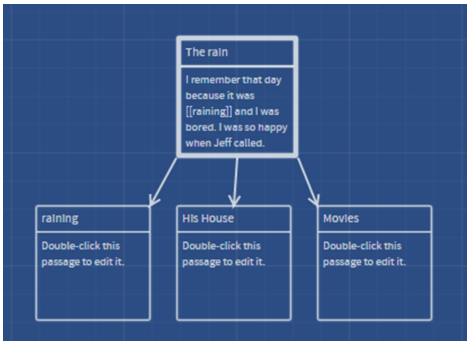

Fig. 1. Twine passages and structure

Table 1. Example of Twine programming syntax with image of layout (see Fig. 1)

```
This is the text of the story. Now,
here is the [[link]] to a different
part. Links can be placed anywhere
within text, or separated out to form
choices, as below:

[[choice 1]]
[[choice 2]]
```

To add a picture:

```
<img
src="ImageFolder\ImageFile.extension>
```

Example:

```
<img
src="MyStoryFolder\sunnyday.jpg">
```

To add sound or video, simply replace "img" with "audio" or "video" as appropriate.

Twine has an extensive online collection of tutorials [15] that can aid with learning basic and complex functions within the engine. These can help an uncertain Twine user—a writer, client, or therapist—become familiar with the engine quickly and seek assistance for any issues that may arise.

3 Game Discussion

3.1 Technical Overview

Twine is a versatile instrument that can be used to create works of varying complexity, without extensive experience with the tool. Of the three works discussed, *The Icecream Parlour* [4] is approximately 1,500 words in length, *Tuesday* [14] approximately 2,500 words, and *threesixfive* [2] approximately 5,000 words. *The Icecream Parlour* [4] and *threesixfive* [2] were the first Twine games their respective authors have created, who each learned how to use Twine during their creation; *Tuesday* was the second Twine game created by Starks [14]. An average of 20 min was attributed to the process of learning how to perform basic functions in Twine, with *The Icecream Parlour* [4] taking approximately two hours to complete in full, *Tuesday* [14] taking approximately 3 h, and *threesixfive* [2] taking approximately ten hours, with these values being reflective of the number of words each narrative contains.

Images are only used in one of the Twine games discussed in this case study—*The Icecream Parlour* [4]—which uses abstract images to create a tangible link to the metaphors used within the text. Cole [4] chose not to incorporate audio within the text, while *threesixfive* [2] and *Tuesday* [14] use neither images nor audio. Barker [2] made this choice due to a desire to focus on the text of *threesixfive*'s narrative; Starks [14] instead considered the sensitivity of the topic of domestic abuse that *Tuesday* explores and determined that including sound or pictures could traumatize potential players of the game. Both Barker [2] and Starks [14] felt that not including images or audio encourages players to remain focused on the choices and outcomes within the game rather than additional stimuli, such as gory representations of abuse that could have been depicted in *Tuesday.*

3.2 *Tuesday* by Katryna Starks [14]

Introduction. *Tuesday* is a game that explores domestic violence through the mechanism of psychological abuse. Unlike physical abuse, which often leaves outward evidence, psychological abuse often leaves only feelings of low self-esteem and confusion. Indeed, some psychological abuse tactics involve making the victim feel crazy or unsure, leaving them to wonder if the abuse even happened at all. This interactive experience was designed to present psychological abuse in a way that clarifies that abuse is happening, hopefully providing a mechanism for the abused to recognize what is happening and seek assistance.

Motivations. The initial idea for this game came about when I was attempting to demonstrate to my Interactive Narrative students that all choice in games must ultimately have a deeper meaning, even if those choices appear inconsequential at first. In seeking a practical example, I spoke of the everyday decisions a woman might make throughout her day, and how those decisions could have dire consequences within an abusive relationship. After the lesson, I realized that the "walking on eggshells" feeling I was trying to convey to my class was a familiar one, though I hadn't been in a physically violence situation. Upon further study, I came across an abuse model that described the emotional aspects of abuse, and realized that, while not being hit, I had been in an abusive situation, and that the anxiety from it remained. I chose to make the game as a practical example for my students, but also as a way of validating my own feelings as a result of my experience.

Design choices. Tuesday is designed to lead the player through the internally experienced effects of psychological abuse via self-doubt. In this way, players can empathize with an abuse victim, living that experience and making choices in the same mental state she shares. My hope is that this game will help abuse victims understand when abuse is happening even if it isn't physical, and also help friends and loved ones understand the mindset of the victim so they can guide her toward outside help in a way that is loving and non-judgemental.

The game is based on the Duluth Power and Control Model [5, 11], a community-focused education program developed by the Domestic Abuse Intervention

Project (DAIP) of Duluth, Minnesota. This model emphasizes community education and influence on political policies in order to remove blame from domestic violence victims and hold abusers accountable for their actions. DAIP has also developed an internationally recognized curriculum for retraining abusers (theduluthmodel.org) [5]. The Duluth Power and Control Model [5] is represented in a wheel-diagram that shows domestic violence as a multi-pronged activity that includes both physical and psychological abuse [11]. The Power and Control Wheel details various types of psychological abuse, including economic abuse, intimidation, coercion and threats, emotional abuse (insults), minimisation and denial, and using children (theduluthmodel.org) [5, 11].

Tuesday was built in Twine and written in second-person. However, based on the Duluth Model [5] and the cathartic nature of the writing for me, I chose to make the main character female and in a heterosexual relationship, which becomes evident in the choices offered to the player. The game consists of several ordinary decisions that the player makes throughout her day. These decisions include what to wear, what to eat, how to do chores, and whether to meet a friend for coffee. Under normal circumstances, this would be a quite boring experience, as these decisions require very little thought and no reason to ponder their aftermath.

However, in Tuesday, these choices aren't as benign as they seem. Upon choosing, the player sees one of four reactions. Either "he" likes the choice, "she" likes the choice, "he" doesn't like the choice, or "he" hates the choice. If the player makes a choice that he likes or that she likes, the task is complete and the story moves to the next task. However, if the player makes a choice that he doesn't like or that he hates, they see a messages similar to this one, regarding which patterned shirt to wear. In this example, the player has chosen a shirt with stripes as opposed to dots, pink or turquoise.

> He doesn't like stripes.
> You take a moment to reconsider, then decide to go with…

The reaction is followed by the same four choices, allowing the player to either confirm their prior choice or make a different one. Initially, the story doesn't appear to branch, as these choices don't have an immediate effect, however the "branches" are in the mind of the player, who believes that there are correct choices and that making them will affect the outcome. This mimics the heightened anxiety of an abuse victim, and the attempt to control the situation through choices and actions.

One important aspect of the game is that, despite the ever present thoughts about his preferences, the "he" in the game is not actually there. At the end of the game, he returns home, indicating that he was at work while you were making decisions. This highlights the anxiety and self-doubt resulting from abuse, so much so that the player reacts to the abusive situation by internalising it, considering whether to obey all of the rules even when no one is physically there to enforce them. This is consistent with reports from battered women that the psychological and emotional abuse they experience has an effect that is similar in severity as the physical abuse they endure [10].

Domestic violence is a sensitive topic, and the use of sound or pictures could traumatize the players I am trying to reach with the game. For that reason, although Twine enables visuals and sound, the entire game is comprised only of text. This keeps players focused on the choices and outcomes within the game rather than gory representations of abuse.

The end of the game highlights a common fallacy of abuse, and helped move me through my final experience of catharsis. In my initial design, I moderated the level of abuse based on the number of decisions the player made that "he" liked. However, I realized that this approach placed the responsibility for abuse on the victim, as if she could manage her abuse based on her actions. The truth is that the responsibility for abuse lies with the abuser, who will simply change any facts or situation as necessary in order to justify whatever abusive acts they want to perform. In response, I removed the moderation and wrote the game so that the abuser's actions are justified differently based on player choices, but the only way to escape abuse completely is to leave the relationship. I provided real help lines for Australia, America and the UK at the end of the game for players who require assistance.

Although it is important to refrain from blaming abuse victims for the abuse they endure, it's also necessary to note that leaving the situation is voluntary. To convey this, there is another ending in the game in which the player can choose to continue the relationship. At the end of each play-through, the choices are the same: stay or go. I hope that players will understand the cycle and if they are experiencing abuse, they will realize that seeking help is the best way forward.

Tuesday was written with a female protagonist in a heterosexual relationship, however this is not the only way that domestic violence is experienced. Males can also be abuse victims, and for severe abusers, males and females use the same abuse techniques at the same frequencies [6]. Therefore, the structure of this game can be adapted to represent female abuse of males, and abuse within queer unions.

Therapeutic benefits. The making of *Tuesday* has provided both an empathetic experience and catharsis for me. Through the exploration of the subject matter, I was able to reflect on my own anxieties and pinpoint the source to a psychologically abusive relationship. Although I realized that I was treated badly, the lack of physical abuse masked the extent of the abuse that occurred – and that my anxiety and other issues were its aftermath. The process of writing *Tuesday* helped me see the truth of my situation, and that I had choices. As a result, I distanced myself from my abuser. The game also provided an empathetic experience in that I understand more fully why abused people stay in those relationships. The anxiety, doubt, and reduced self-esteem that stems from psychological abuse makes abuse victims doubt themselves and absolve their abusers, keeping them in a cycle of trying to "fix" themselves and their own behaviors instead of placing blame on the abuser, where it belongs.

Although the game is used here as an example of self-induced therapeutic benefit for me as the author, my hope in creating this piece was that people who played it would recognize the anxiety experienced within the game, and use that experience to identify if they were in an abusive relationship. The feeling of anxiety would hopefully be moderated by the inclusion of helpline information at the end, and the understanding that the creation of this experience means that someone understands their situation, and they are not alone. The combination of recognition, empathy and information might be an incentive to seek help.

Although the game has not received official recognition, I did enter it into Indie Cade 2014. It received positive feedback and suggestions for expanding the experience. The game was also played as a demonstration for employees of R4Respect, a local

non-profit with a domestic violence prevention program. The R4Respect team reviewed it positively and were interested in the potential of Twine to create these types of experiences. I have also demonstrated the game within a classroom environment as an example of a Twine-based Serious Game, and received positive feedback from my students. These classes happened to be predominantly male, which provided a unique opportunity to test a female-leaning game with a mostly male audience. The students demonstrated empathy and understanding, and even a sense of protectiveness over the protagonist, often making disparaging remarks around the abuser in the story. At the end, there was consistently a unanimous decision to call the hotline. After choosing the hotline, I demonstrated the other ending with the choice to stay. This was followed by a discussion about the design decision of the other ending and placement of responsibility for abuse on the abuser, thus completing the learning experience.

3.3 *threesixfive* by Dakoda Barker [2]

Introduction. Conversations about my struggle with chronic health conditions have rarely left me feeling uplifted. More often than not, the responses I receive indicate a lack of understanding or a dismissal of my chronic health conditions entirely; frequently, relatives whose conditions are similar but manifest in less significant ways are mentioned as evidence that I am simply too fragile and should cease complaining. *threesixfive* is my cathartic response to this; it is an attempt to prevent further harmful, unsupportive comments by allowing players to, through interactive narrative, "experience" the same kinds of challenges that I—and others who have similar struggles with chronic health conditions—must overcome each day.

Motivations. *threesixfive* is an autobiographical text that was born from a panicked exercise: I attempted to chart the activities that were required of me each day in order to manage my chronic health conditions effectively and maintain the appearance of an ordinary, functional adult and found that there were not enough hours in each twenty-four-hour period. In creating *threesixfive*, I wanted to find a way to process this experience—I wanted to find a way to make my life "winnable"—while also creating an interactive narrative that could help to educate people and generate empathy, for others as well as myself.

Design choices. The narrative in *threesixfive* begins at ten pm on an unspecified day. This decision reflects the notion that managing chronic health conditions does not begin from the moment that a person wakes, but can be influenced by a number of factors from the previous day. Forcing the player to be proactive and forward-thinking makes them more accountable for less optimal choices and their outcomes. This also pushes the player towards making decisions under added levels of stress: sleeping takes up many of the limited hours and therefore restricts how many other activities can be completed; however, sleep is vital to ensuring that the player-character can function for the duration of the twenty-four-hour period.

Six attributes are defined for the player-character that help to determine which of the four endings the player receives after the cycle has been completed: energy, fitness,

relaxation, socialisation, classwork, and housework. These represent the broad areas that can affect and be affected by the chronic health conditions explored in *threesixfive*. Originally, these attributes and their values were to be hidden from the player in favor of a streamlined focus on the narrative; however, I decided to make these attributes visible in order to give the player a clearer goal. With the visible attributes and an early passage establishing an overarching goal, the player will likely strive to achieve the most optimal outcome. Despite this, the player cannot form a perfect strategy due to the fact that each activity carries equal probability for failure or success—this carries the additional benefit of demonstrating to the player that someone with depression, anxiety, and chronic pain may not be able to achieve their goals even if they can determine the best possible approach to the challenges that lie before them.

Second-person perspective is used to foster a stronger connection between player and protagonist. Though this perspective positions the player as the protagonist, several fourth-wall breaking passages suggest that the narrator—the "character" telling the player the narrative—is the true protagonist; the narrator hints to the player that the experiences contained within *threesixfive* belong to them, and the player exists as an observer. One passage in particular highlights this:

> You are not you. You are me. Or maybe you are you. Who can really say, for sure? You are whoever you want to be: me, you, your neighbor, that one cousin you only see at Christmas.

The effectiveness of second person narration in generating empathy can be undermined if the player is unable to reconcile elements of the player-character that clash with their own perspective; by acknowledging the uncertainty around the owner of the pronoun "you", I attempt to offer the player alternative ways to interpret the protagonist character. The intent here is to prevent players from disengaging from the content if they encounter parts of the character that are not applicable to them as a person and maintain the potential for building empathy and understanding.

Chronic health conditions, by definition, are a recurring problem. This is captured by the title, *threesixfive*, which references the fact that managing chronic health conditions is a challenge every day of the year. This notion is demonstrated through the use of nondescript language and deliberate ambiguity throughout the narrative, which allow the events to be applicable to as many contexts as possible. Each of the four endings concludes with a link to the opening passage; this reinforces the cyclical nature of managing a chronic health condition—there is no true "ending".

Therapeutic benefits. The development of *threesixfive* did not "solve" my chronic health conditions or the issues surrounding them—the same number of hours exist in each day, as do the same number of necessary tasks. However, the process of creating *threesixfive* helped me to externalize the problem, which allowed me to stop fixating on these issues and instead use that time productively and thereby feel better and more accomplished. Designing my life as "winnable"—including some design ideas that did not make it into *threesixfive*—contributed to an improved mindset: I could frame each day as a minor victory worth striving for to minimize the overwhelming feeling, and—paradoxically—attribute wasted or unproductive days as minor setbacks in a large system of continued successes. Indirectly, the process of sharing *threesixfive* online has been met with positive anecdotal comments from players who enjoyed the experience

of seeing themselves or their struggles represented; this feedback validates my experiences and allows me to feel understood, thereby reducing some of the baggage associated with living with my chronic health conditions.

3.4 *The Icecream Parlour* by Alayna Cole [4]

Introduction. *The Icecream Parlour* is a satirical exploration of sexuality and people's stereotypical views in response to others who have similar or varied sexualities or gender identities. The interactive narrative was designed to increase understanding of some typical experiences people have in relation to sexuality, not just within the perceived dichotomy between heterosexual identity and queer identity, but also between identities within the queer community.

Motivations. The creation of *The Icecream Parlour* was motivated by the lack of empathy that I have witnessed personally and professionally for the experiences of others in relation to sexuality. The narrative was created so that I might experience catharsis in response to discrimination for people of differing sexualities, with the secondary goal of the narrative acting as a tool that can aid in catharsis for or increase understanding in readers.

Design choices. The player is able to select the icecream flavor they are "attracted to" in the opening passage: vanilla or strawberry. In addition, the player is offered an alternative flavor ("something else"), an option indicating indifference ("any flavour is fine"), and a choice not to eat icecream at all ("no icecream, thanks"). These five options are a simplified representation of the spectrum of diverse sexualities, which becomes clearer in the passages that follow: vanilla symbolizes heterosexuality; strawberry symbolizes gay/lesbian identities; alternative flavors symbolizes attraction to non-binary genders; the 'indifferent' option indicates a person's inability to choose a "favourite" option from those offered and is designed to symbolize plurisexual identities (such as bisexual, pansexual, non-monosexual, and other multi-gender attracted identities); and a dislike or disinterest in icecream symbolizes asexuality.

The narrator of *The Icecream Parlour* refers to the player in second person; however, the narrator also hints that the "you" being addressed is not necessarily the player themselves, but an alternative protagonist whose experiences the player is simply observing. The opening passage indicates this:

> Welcome to my icecream parlour. This is where your story begins.
>
> And yet, it is not your story. It is the story of many, and the story of no one, and the story of somebody else, whose perspective matters just as much as your own.

Second-person perspective allows players to identify with the protagonist if they choose to or are able to, but also allows them to distance themselves from the protagonist and suspend their disbelief if the protagonist's responses and reactions differ from their own. This allows for multiple playthroughs of the interactive narrative, with some acting as cathartic and others acting to increase the player's understanding of the experiences of others.

The Icecream Parlour features nine endings, with different degrees of variation. Each resolution ends with an invitation for the player to return to the opening passage and play through the interactive narrative again, embodying a different identity and thus experiencing an alternative perspective.

The most common resolving sentence is "You're safe here, dear. I don't judge. Have whatever flavors you like and come back any time," which features in five of the nine endings and can be reached by choosing any flavor but "vanilla" in the opening passage. This design choice was made to indicate the judgement and prejudice that all sexualities outside the societal norm can experience. It is important to note that not all discrimination against members of the queer community comes from outside the community; different identities within the queer community can also be prejudiced against one another. This type of discrimination is demonstrated in the following passage:

> Sometimes the whispers even follow you here, among people who are meant to be supportive, but generally this is a safe space. A community.

The positive ending that can be reached after choosing 'vanilla' in the opening passage is resolved with the line, "You're welcome to return when you are in need of another scoop." This line can also be reached after choosing "strawberry" in the first passage. In both cases, the player must agree that there is no point to abusing others for being attracted to a different flavor; this is designed to symbolize an ideal coexistence between those who desire same gender relationships and those who desire other gender relationships. A more negative ending can be reached by choosing to abuse those with different opinions on icecream. Although the narrator adopts a much more aggressive persona in this resolution than the others, it is still not an entirely negative ending as the narrator still offers for the player to return to the icecream parlor if they are more willing to be open-minded about icecream preferences, and therefore sexualities.

An alternative, neutral ending can be reached by choosing "no icecream, thanks" in the first passage. This leads the player to a passage that emphasizes the importance of empathy in *The Icecream Parlour*, as the resolution sentence encourages the player to start the narrative again and become "a friend who has always loved icecream", to see the world from their perspective.

Therapeutic benefits. *The Icecream Parlour* was created as a form of catharsis, both for myself and for readers who share my personal frustration at the triviality of the conflicts between people in response to sexuality and how this sexuality is expressed. This triviality is highlighted in the interactive narrative through the use of an absurd extended metaphor that connects sexuality or sexual attraction to a person's preferred flavors of icecream. The humor within *The Icecream Parlour*, as well as the unapologetically honest narrator, had therapeutic benefits for me as I wrote the narrative, as the process of embodying this character allowed me to express my beliefs and frustrations.

4 Twine's Potential in Writing Therapy

Games have been used for CBT, such as the Triangle of Life game [1] and SPARX [8], and have been effective compared to waitlists and to other types of therapy; however, Twine is not a fully created game to be experienced, but rather a writing tool for non-linear, interactive expression. As such, it can be used to enhance the experience of CBT even when games are present. For instance, after learning about the Cognitive Triangle in Triangle of Life [1] clients can use Twine to create their own story, carefully inserting their own thoughts, feelings and behaviors in response to the events in their lives. Similarly, the authors of the SPARX game supplied clients with a paper journal to record reflections as they played the game [8], introducing a separate written component to the CBT therapy experience.

Writing therapy is included in several forms of CBT, including the Trauma Narrative in Trauma-Focused CBT (TF-CBT) [3] and other journal/narrative interventions such as Online Structured Writing Therapy (OSWT) [13], Narrative Exposure Therapy (NET) [12] and Cognitive Behavioral Writing Therapy (CBWT) [16]. These forms of writing therapy all include: an initial writing of events, thoughts and feelings; a reflection on the thoughts and feelings to ascertain their usefulness and accuracy; and reframing of the thoughts and feelings to more positive ones. Two therapies, OSWT and CBWT, also include a final component of sharing the story with others.

Several writing therapists have noted the non-linear storytelling that naturally occurs during client memory recollections [3, 12], and have included it in the therapy process by having the client write and refine the narrative ad hoc, but rewrite it more cohesively after making connections. Twine can be beneficial for storing non-linear fragments of memory, creating links between thoughts and events, and even expanding on certain words or phrases between memories. Despite the non-linear nature of memory and the tangents that clients write in the moments they have stronger feeling, the Twine narrative will retain cohesiveness at the end, providing the client with full expression of their own thoughts while maintaining an organized document for others to read in the Social Sharing portion of therapy.

As an example, a client may begin a trauma narrative and then talk about noticing a vase in a room of their home. The client may want to expand on their feelings about the vase. Perhaps it was their mother's favorite item, or a special gift they saved up to buy, or they imagined they were a genie who was trapped in it. On paper, this would create an aside that may impact the flow of the story, creating a fractured experience for the client as they reread their work, and for others reading during social sharing. In a paper structure with space and organization constraints, the therapist and client might have trouble deciding where, and if, the details of the vase are included in the final document, especially if they don't directly pertain to the traumatic event. In Twine, however, the client could simply create a link that contains more details about the vase, with another link that returns the reader to the main thread of the story. If readers want to understand the client's thoughts about the vase, they click the vase link and read; if the reader prefers to simply follow the main story thread, they are free to ignore the link and continue on. This separation of non-linear thoughts allows the client to write and think in free-form because they can always add more detail later, and prevents the client

from feeling like they have to be good at storytelling and writing. The software organizes the story fragments into a cohesive whole.

The non-linear nature of Twine also supports, and even encourages, multiple story endings. This allows the client to create an end narrative that acknowledges their unhelpful thought patterns and how those thoughts might affect them in a future, imagined reality, while also creating branches in which they successfully change their thoughts and patterns, and the positive future that results in. Upon re-experiencing the narrative, the act of considering the unhelpful thoughts and then choosing the positive thoughts can remind the client that they can choose their own thought path, which gives them control of their future despite the trauma of their past.

5 Implementation Strengths and Weaknesses

Cohen and Mannarino [3] have noted that clients of TF-CBT often choose to write trauma narratives using a computer. In those instances, Twine is easily presented as an alternate writing tool. Cohen and Mannarino [3] also note that TF-CBT clients sometimes use other forms of creative expression to present trauma narratives, such as poetry, drama, song and dance. With the wide variety of expression that TF-CBT in particular provides, Twine should integrate well and be quite easy to implement.

The low cost and time investment required to learn and use Twine makes the software suited as a therapeutic writing tool. The engine's functionality and ease-of-use makes it accessible to people who do not consider themselves game designers or creative writers, thus making the engine inclusive for clients and therapists. It is not necessary for a person to have an understanding of narrative theory or game design principles to create a narrative in Twine that can have therapeutic benefits for the writer; however, if a user of Twine has a background in game design or creative writing—as do the authors of the Twine narratives included in this case study—there is nothing to restrict the use of narrative theory or game design principles as a foundational for the resulting output. Therapy clients may choose to further their skills in these areas to enhance the Social Sharing portion of therapy in which others will read and interact with the work, however the primary therapeutic use of Twine is for the benefit of the client, and the resulting narrative will only be shared with those the client wishes to see it.

A possible weakness of using Twine for writing therapy is the assumption that a client will have access to a computer, either personally or through their psychologist. Another weakness involves the choices about where the narrative will reside. Confidentiality will prevent therapists from being able to share a computer with clients, so one will need to be provided for clients only. The therapist may also choose to use password-protected folders, or external USB drives to store client narratives so they are not accessible to other staff or clientele. Finally, some clients may want to write with pen and paper, or create a linear narrative with a regular word processor; in these cases, Twine can be offered for use after writing in order to reorganize narratives into an interactive format if the client wishes. The authors of this paper are not asserting that Twine should be the only form of writing offered within narrative therapy, only that it presents a choice that can enhance the effects of narrative therapy by helping clients express themselves and their stories more completely.

6 Conclusion

The association between stories and catharsis has been noted since the times of Aristotle and has been subsequently expanded to include the healing and liberating self-response of the author as well as the response of the audience [9]. Furthermore, it has moved beyond the literary realm and into psychology, observed as a way of expressing and discovering identity [7] and as a way of provoking therapeutic response with various forms of cognitive behavioral therapy [3, 12, 13, 16]. The interactive nature of Twine stories, and the ease of use as a choice-based narrative device makes it a possible facilitator in the use of cathartic storytelling both informally and with professional psychological assistance.

For each of the authors in this paper, Twine has provided a way to move through several steps that mimic writing therapy in a way that provides a self-reported therapeutic catharsis. We chose to write stories about our own life experiences, including any details we felt relevant to capture the aspect of the experience that we wanted to focus on. The interactive nature of the Twine writing tool enabled us to provide virtual choices for ourselves, and the process of enabling choice helped us to reframe our experiences and consider alternate ways of handling them. Had we been in therapeutic CBWT sessions, this process may have been strengthened, providing an even greater therapeutic response. Finally, each of these games is publicly hosted [2, 4, 14], allowing us to share our experiences, providing validation and closure. Although these stories contain self-reports of catharsis, these observations offer a basis for further research into the use of Twine in therapeutic situations. Should the use of Twine provide similar outcomes as traditional forms of writing therapy, then creators of serious games can be encouraged to not only make games that focus on educating others, but also to create cathartic experiences that benefit themselves.

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