The Game of Life: How Playing Gamified Interactive Narratives Affects Career Planning in Cambodia

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To improve economic opportunity in Cambodia, we used social cognitive theory to develop gamified, interactive narratives using mobile phones. Participants guided their chosen character toward their "dream job" goal while encountering a series of barriers along the way. Participants (N = 1,625) were randomly assigned to one of four message frequency experimental conditions: a no-play control condition or playing the interactive narrative one, two, or five times. Compared with not playing the interactive narrative (control), those who played showed higher perceived self-efficacy, response efficacy, and behavioral intentions. Playing more times was associated with less attentional focus and enjoyment, but greater narrative understanding and behavioral intentions. These results support the promise of interactive technology using basic mobile phones for social and behavioral change. Moreover, this study addresses the important question of how much exposure to an intervention is necessary to affect change.

Keywords: narrative, interactive narrative, message frequency, exposure, planning behaviors

Improving economic opportunity for youth is a major priority for Cambodia, where more than 50% of the population is under the age of 24. This includes encouraging university education, technical and vocational training (Seangmean, Sokheng, & Somonich, 2015), as well as efforts to help young people

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successfully navigate the labor market. Formative research in Cambodia indicated that a key impediment for young people in successful job-seeking efforts is the lack of "soft skills" needed to successfully plan for, engage with, and enter the workforce. In response, we scripted a choose-your-own-adventure style interactive narrative targeting young people that was designed to improve planning and build self-efficacy.

Social Cognitive Theory

Using social cognitive theory (SCT; Bandura, 2004a), we developed three scripts for "Wanji games," gamified interactive narratives that use spoken audio delivered via basic mobile phones to allow players to make critical choices for fictional characters. Adding interactive play is perhaps the most recent chapter in the long history of using social cognitive theory to develop entertainment education interventions (Bandura, 2004b). Social cognitive theory is a goal-oriented theory that highlights that people make choices to achieve their goals. Prior research has shown that short-term as opposed to long-term goals have the most direct impact on current behavior (Bandura, 2001). Consequently, to encourage long-term planning, social cognitive theory suggests breaking long-term goals into concrete, actionable short-term goals or behavioral intentions (Bandura, 2001, 2004b). Thus, social cognitive theory is a particularly good fit for an intervention with the aim of helping young adults to develop and plan for long-term career aspirations.

Another crucial element of social cognitive theory is self-efficacy (Bandura, 2004a). According to SCT, individual goals are determined both by perceived self-efficacy (belief that they are capable of achieving their goals) and by outcome expectations (beliefs about the likely positive and negative consequences of their behaviors). People do not create goals or attempt behaviors for which they foresee little chance of success. To set and attempt challenging goals, people must believe they have the ability to achieve those goals (Bandura, 2001). A robust self-efficacy that helps people persist even against barriers and impediments can be developed through mastery experiences and through constructive feedback (Bandura, 1977). To enable a more resilient self-efficacy, the scripts for the gamified, interactive narratives featured various impediments and gave participants opportunities to choose how to react to those barriers and persevere in the pursuit of challenging, long-term goals.

Bandura's (1977) distinction between people's expectations of whether they can perform a behavior (self-efficacy) and the expected effects of performing the behavior (outcome expectations) is mirrored in Witte's (1996) extended parallel process model (EPPM). EPPM highlights the importance of response efficacy as the belief that completing a specific task or following a particular recommended response will be helpful in achieving a particular goal. In the context of career planning, response efficacy would be believing that the recommended tasks will help in achieving one's career goals. Thus, the scripts for the gamified, interactive narratives incorporated negative outcomes that prevented achieving goals when players chose not to persist and positive goal-related outcomes when characters persevered.

Finally, outcome expectations can also include expectations for how others will react, such as approval or disapproval from family and friends (Bandura, 2004a). By anticipating social consequences from others and also through internalized self-sanctions based on anticipated social sanctions, expectations about the reactions of others can be powerful (Bandura, 2001). In selecting goals, people consider how their interpersonal networks will react to their choices. In Cambodia, both parents' attitudes and parents' social

ties with relatives who supported school affected whether parents were involved with their children's schooling (Eng, Szmodis, & Muslow, 2014). For Cambodian young adults, important referent groups include friends, parents, and extended families.

Narrative Persuasion

The past decade has witnessed a surge in the use of fictional stories to deliver crucial factual information (Shen, Sheer, Li, & Shen, 2015; Weber & Wirth, 2014). Indeed, a content analysis of 1,574 peer-reviewed articles published over 65 years, in the *Journal of Communication*, confirms that narrative theory is second only to framing in publishing frequency (Walter, Cody, & Ball-Rokeach, 2018). The growing popularity of narratives is due to an ever-expanding body of research demonstrating that they are successful vehicles for persuasion because they increase involvement with the story and its characters, while simultaneously reducing counterarguing (Moyer-Gusé, 2008). Engaging stories highlighting characters that audience members identify with suppress an audience member's ability to generate negative responses, thereby encouraging acceptance of story-consistent information (de Graaf, Hoeken, Sanders, & Beentjes, 2009). This inverse relationship between involvement with both the narrative (also known as transportation; Green & Brock, 2002; or narrative engagement, Busselle & Bilandzic, 2008) and its characters (commonly known as identification; Cohen, 2001) on the one hand, and the sort of resistance that often confronts more typical persuasive messages is the main advantage of narrative forms of persuasion compared with nonnarrative messages (Braddock & Dillard, 2016; Murphy, Frank, Chatterjee, & Baezconde-Garbanati, 2013; Murphy et al., 2015; Tukachinsky & Stokunaga, 2013). It is important to note, however, that the impact of fictional narratives is dependent on two related, but separate, components. First, the story must be able to transport audience members into a narrative world where disbelief is suspended (Green & Brock, 2002). Second, as Bandura (2001) and others have shown, we pay more attention to and learn more from models with which we identify, like, feel as if we know, or perceive to be similar to us.

Some of the most salient predictors of whether or not we are going to identify with a person or fictional character are demographic cues such as gender, age, and ethnicity. In the current study, therefore, it was critical that the characters, potential careers portrayed, as well as the barriers encountered were plausible to our target audience—namely Cambodian youth. To this end, the gamified, interactive narrative in the current study featured Cambodian characters slightly older than our participants whose "dream job" included construction, banking, or owning a bakery.

Interactivity

In the context of narrative persuasion, Green and Jenkins (2014) contrasted interactive narratives with traditional, linear stories, where the reader moves from beginning to end, within the limits of a story. Interactive narratives are defined as stories "in which the reader has opportunities to decide the direction of the narrative, often at a key plot point" (Green & Jenkins, 2014, p. 479). These choose your own adventure stories are characterized by increased user control and decreased structure. An early investigation of interactive narratives as a form of role-playing by Janis and King (1954) showed that participants who actively generated arguments for their characters were more persuaded than participants who were simply exposed to the same argument. To this end, when assuming the perspective of a fictional character,

individuals strive to behave in accordance with the role expectations for that particular character. Indeed, role-playing in an interactive context enables individuals to explore options outside the limitations of their specific identity (Peng, Lee, & Heeter, 2010).

Green and Jenkins (2014) posited that interactive narratives affect persuasion through several distinct mechanisms, including narrative engagement and identification. This concurs with previous studies that link interactivity with increased identification and engagement. In the context of video games, Hefner, Klimmt, and Vorderer (2007), showed that people who had an interactive experience tended to identify with the game protagonist to a much greater extent than people who could not interact with the game. Hand and Varan (2008) suggest that interactive narratives contribute to a more immersive and transformative experience for audiences by adding agency. This argument was validated by Walter and Tsfati (2018), who demonstrated that participants who played a violent video game and identified with the main character were more likely to justify their behavior as within the game rules, whereas those who watched the same game being played tended to place the fault with the character's personality traits. To summarize the impact of interactivity, a meta-analysis of 67 articles promoting social change found that interventions featuring interactive technology have a small, but statistically significant, enhanced effect compared with interventions that do not include interactive features that allow users to make their own choices (Yang et al., 2019). In sum, credible evidence suggests that even a minimal amount of interactivity can help shape and control the flow of events in the narrative, encourage individuals to transcend their typical role as passive audience members, and take on a more agentic position in the story (Green, Brock, & Kaufman, 2004).

In an example of interactivity comparable to the choices available to participants playing on the simple mobile phones featured in this study, a study by Walter, Murphy, and Gillig (2017) asked participants to make choices for a fictional protagonist, such as what to wear that day or what to have for lunch, at five different points throughout a narrative that involved a member of a stigmatized group—a transgender athlete, an undocumented migrant, or an American Muslim student. In each of these three studies, participants in the interactive condition showed greater identification with the protagonist and story-consistent attitude change toward not only the specific character but the stigmatized group more generally than participants in the control condition who read the exact same stories, but did not make choices for the stigmatized character. In the current study, we similarly asked participants to make a series of career choices for a character throughout the gamified interactive narrative, with the expectation that making such interactive choices for a character would likewise increase the overall impact of the story.

Compared with a control condition in which the interactive narrative is not played, playing a gamified, interactive narrative will lead to:

H1:   greater self-efficacy,

H2:   greater response efficacy,

H3:   more positive social outcome expectations, and

H4:   increased behavioral intentions.

Message Frequency and Exposure

Within the field of interactive health communication interventions, message frequency has been shown to moderate the impact of the interventions (Yang et al., 2019). Messages that were repeated daily were more effective than those with just a single exposure. But how many repetitions are optimal when playing an interactive intervention multiple times back-to-back? Next, we review the seminal literature on repeated exposure to underscore our rationale for including frequency of exposure in our design.

Zajonc (1968) empirically demonstrated mere exposure, whereby repeated, exposures of a particular stimulus—as long as there is nothing inherently negative about the stimulus—will result in a more positive attitude toward that particular stimulus. Both traditional literature reviews and meta-analyses of the hundreds of studies documenting this association between repetition and liking (Bornstein, 1989; Montoya, Horton, Vevea, Citkowicz, & Lauber, 2017) conclude that the mere exposure effect is robust. But there are limiting conditions to the ability of repetition to increase liking, such as boredom (Bornstein, Kale, & Cornell, 1990). We can all recall television commercials that initially seemed charming, but became obnoxious when repeated too frequently (e.g., Burger King's "Where's the Beef" or Verizon's "Can You Hear Me Now" campaigns). Indeed, marketers have spent millions of dollars to identify the "sweet spot" or the number of exposures where positive affect continues to increase. Research by Zajonc (1968) and Murphy, Monahan, and Zajonc (1993) suggests that while exposures to stimuli that individuals are aware of gain positive affect in their first three to five exposures before becoming boring, stimuli of which they are unaware tend to level off at about 10 exposures without evoking negative affect. In other words, to the extent that audiences become consciously aware of a persuasive attempt, the attempt becomes less persuasive.

Studies from the field of advertising may shed additional light. In situations where participants shallowly process a message, repeated exposure leads to more choice to purchase, but in deep processing, repeated exposure does not (Nordhielm, 2002). Likewise, when an ad is only viewed once or twice, emotions influence decision making, but when the ad has been seen between three to 10 times, cognitive rationales matter more for decision making on purchase intentions (Burton, Gollins, McNeely, & Walls, 2019). Thus, the effects of repeated exposure are mediated through the kinds of processing and cognitive and affective reactions that audiences have. For this study, using a gamified, interactive narrative, the most relevant mediators are those of experiential engagement with the narrative. Specifically, we hypothesize the following:

H5:   *Measures of experiential engagement (identification with characters, narrative engagement, and enjoyment) mediate the effect of the number of interactive narrative plays (1, 2 or 5 times) on (a) self-efficacy, (b) response efficacy, (c) social outcomes expectations, and (d) behavioral intentions.*

Methods

Research Setting

For the past two decades, Cambodia has experienced high rates of economic growth, fueled largely by gains in garment manufacturing and tourism, and averaging 8% growth in its gross domestic product

(GDP) between 1998 and 2018 (Cunningham & Hollweg, 2019). Despite this positive economic trend, much of the growth in youth employment (defined as employment for individuals ages 15–24) has been in low-skilled jobs with low-quality working conditions (McKay, Mussida, & Veruete, 2018). Ninety-four percent of jobs in Cambodia are low skilled, and although wages have improved, more than 50% of employers operate outside of the formal economy. Given regional changes in consumption habits and trade policy, Cambodia needs to better integrate into the global supply chain while increasing the number of technically advanced employment opportunities. In light of this, improving the quality of formal education (OECD Development Center, 2017) and promoting labor mobility along with job matching (Cunningham & Hollweg, 2019) are key policy goals emphasized by the Cambodian government and international economic development agencies such as the World Bank and International Labour Organization. To take advantage of these opportunities, Cambodian youth require not only formal education, but training in the steps necessary to acquire a high-skilled job. BBC Media Action's Klahan9 Project sought to provide youth with information about career opportunities, job-seeking advice, communication, problem solving and planning (Southall, Khoun, Keomonyneath, & Lysivning, 2018). One of the Klahan9 evaluation's key findings was that young people in Cambodia often encounter a disconnect between their career ambitions and available opportunities because they fail to foresee challenges and adapt to overcome them. Promoting career planning skills may thus benefit both individual youth as well as Cambodian economic prosperity broadly as the labor market adjusts to the changing national and global economy.

All research activities were conducted in the Banteay Meanchey province of Cambodia with members of the Union of Youth Federations of Cambodia (UYFC), a nongovernmental youth-led training and economic development organization. The research team selected five districts in Banteay Meanchey, two peri-urban (Serei Saophoan and Poi Pet) and three rural (Monghol Borei, Preah Netr Preah, and Svay Chek) from which to recruit participants through local schools and the UYFC network. With the exception of the Serei Saophoan location, which was the UYFC center, public secondary schools at each location served as testing facilities for the purpose of the experiment. During the data collection period, school was not in session, but permission to use school facilities (as well as some recruitment support) was provided by administrators at each school. Recruitment of participants was carried out through word of mouth and snowball sampling. The research team mobilized members of UYFC groups and contacted teachers at the local school who then referred them to student respondents, who then referred their friends.

Participants

Because the content of the gamified, interactive narrative being tested was designed to promote career planning prior to first employment, it was important to target youth in the later years of secondary school who had not yet achieved their career goals. A total of 1,625 Cambodian youth between the ages of 16 and 21 ($M = 17$, $SD = 1.2$) participated in this study and received 15,000 Cambodian riel (approximately US$3) as an incentive. Of these, 812 (50%) were female and 813 (50%) were male. The majority of the sample ($n = 899$, 55%) lived in peri-urban/suburban areas, 30.7% ($n = 499$) were from urban areas, and the remainder (14%, $n = 227$) were from rural towns and villages. Eighty-four percent ($n = 1,371$, 694 females, 677 males) were not employed, while 8% ($n = 129$) had some regular wage, 6% ($n = 97$) worked as day laborers, and the rest reported either being self-employed or employed in another type of work, such as a family business (<1%, $n = 13$). The plurality of participants (42%) was

in the 11th grade. To better match the intended audience of youth who are working toward improving their career prospects, the 24 participants (1.5%) who were not currently students were excluded from the analytical sample. Removing these participants from the analysis did not change the pattern of statistically significant results reported below.

Procedure

At each site, upon registration, respondents were briefed on confidentiality, the requirements of the experiment, including the expected time commitment (up to 75 minutes) and the incentive. Participants were then provided an informed consent form in accordance with the procedure approved by the Institutional Review Board. No participants declined to participate following this briefing. At this time, participants were also excluded if they did not fall within the target age range. Once the screening was completed, participants sat for a brief baseline survey (approximately 10 minutes).

Using a between-subjects experimental design, participants were randomly assigned to play an interactive narrative Dream Job Game, via mobile phone, zero, one, two, or five times. They were provided with headsets and seated in individual cubicles to ensure the privacy of their responses, and allowed as much time as needed to do so (the amount of time spent playing varied from 0, in the control condition, to approximately 5 to 25 minutes, depending on exposure condition). Random assignment to number of plays was accomplished via the assignment of randomly sorted identification numbers. Each testing site used two lists of identification numbers, one for male and one for female participants, and continued recruitment until the gender quota was reached or the available population for recruitment was exhausted at that site. Because this procedure resulted in a small deficit in the recruitment of male participants, a fifth location, Poi Pet, was added to recruit participants from a local all-boys school ($n = 164$). As a result, gender composition by location was somewhat unbalanced; however, boys recruited from Poi Pet did not differ significantly on demographic valuables from other boys in the sample. Moreover, hierarchical modeling with participants nested within locations yielded the same results as the analysis reported below. The unique identification number assigned to each participant corresponded to one of the four treatment conditions. When this number was entered into the phone-based interactive voice response platform, participants were automatically enabled to play through the interactive narrative the assigned number of times. Participants in the control group (those assigned to play 0 times), were assigned identification numbers in the 1,000s, and were escorted directly to the posttest interview after registration.

After completing their randomly assigned number of plays of the gamified, interactive narrative, participants were escorted to a space where the posttest survey was conducted (lasting approximately 20 minutes). All baseline and posttest surveys were conducted using the computer-assisted personal interviewing software SurveyCTO on tablet computers. All study materials, including scripts, survey instruments, and consent forms were iteratively translated into Khmer (Cambodia's official language) and then independently back-translated into English to ensure that key concepts and scale items retained their intended meanings. Native Khmer speakers, including researchers and educators, were consulted throughout the story development process to ensure that the content was culturally appropriate and relevant to the target population.

Gamified, Interactive Narrative

Using simple mobile phones, provided by the research team, participants called the Wanji platform to play the Dream Job Game. The platform only requires limited phone features in which users listen to a menu of options and choose a number to select their choice. The participants were told that their goal was to help the character they chose get their "dream job." The participant was then given the option to play one of three separate characters: Pheakdey, who wants to supervise construction sites; Rotha, who wants to work in a bank; or Vathana, who wants to open a chain of bakeries. We selected these three jobs because they represented various career fields, and because all three required training, education, or other long-term planning and commitment to realize. Working at a bank is commonly perceived as a desirable white-collar career, construction site supervisor was highlighted as one of the 20 "STEM Careers of The Future," and opening a bakery pairs a blue-collar craft with entrepreneurship (OER Cambodia, n.d.). Thus, we offered players a diversity of paths with the hope that at least one might be similar to their own ambition.

The player then guided their chosen character toward their "dream job" while encountering a series of barriers along the way. At each barrier players must decide for their character whether to persist or give up on their dream career. Although the three different careers each had unique barriers, for purposes of research design, the structure and language were kept fairly consistent, regardless of whether the player was pursuing the construction, bank or bakery career path. In each interactive narrative, the player encounters seven bifurcated decision points in which they could either choose to persist with pursuing their dream job or stray from the path. The gamified, interactive narrative was structured in such a way that, when they choose to stray from the successful path, they are given a disappointing end but told, "Let's see what would happen if . . ." they had made the better choice. In this way, every player will encounter all seven key messages each time they play.

Within each of the three career narratives there are seven levels or decisions participants make for their character, each of which reinforce the importance of planning behaviors. In each level, the script includes a key message that summarizes what the player is meant to learn in that level. In the first level, the player must decide whether to write down a plan to achieve their dream job, or attempt to remember each step of the plan (Message: "Starting a plan and breaking it down into smaller steps is the best way to succeed"). In the second level, the player must decide whether to do research about their dream job after school or hang out with their friends instead (Message: "Focusing on one task at a time is the best way to go through the steps of a plan"). In the third level, the player must decide whether or not to talk to somebody who already has that job (Message: "Continue to go through the plan step by step"). In the fourth level, the player approaches someone without planning ahead and is rebuffed. They must decide whether to persevere and plan more effectively or to quit (Message: "It pays to be persistent"). In the fifth level, they make an appointment to talk to the person, but must decide whether or not to show up on time the next day (Message: "It is important to keep to the plan"). In the sixth level, they speak to the person, but discover that the road to their dream job is much longer than they originally planned. They must decide whether or not to revise their plan from short-term or to long-term planning (Message: "When things are going to take a long time, a plan is more important than ever"). In the seventh and final level, they are offered a short-term monetary gain that diverges from their dream job or a longer term investment to pursue their original

goal (Message: "Sometimes to achieve your goal, you have to sacrifice and take the long view over the quick profit").

Each of the three career stories ends with an epilogue showing the character several years in the future and summarizing the key messages. The story ends with the message that "You've come to the end of this story. Play again to hear a different story or to make different choices along the way." In sum, playing through the gamified, interactive narrative once exposes players to each of the seven key messages. More plays equate to greater message frequency.

Measures

Social Outcome Expectations

To measure social outcome expectations, we adapted items from the parental approval outcome expectations scale in Noar and associates (2015). We retained the original two items, "It would be something that my mom supports" and "It would be something that my dad supports" (p. 169). To capture a broader variety of social support from interpersonal networks, we also asked the same items for friend and extended family support. This yielded four items with a Cronbach's alpha of .80, with higher scores indicating more supportive social outcome expectations.

Self-Efficacy

To measure self-efficacy, we asked participants a series of 8 Likert-type items with response options ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Each item began with, "I can . . . ." The stem of each item was based on behaviors that were included within each script. For example, items included, "I can pursue a career that interests me," "I can find people to ask questions about my dream job," and "I can plan for many steps that may take a long time." The eight items achieved acceptable reliability (Cronbach's alpha = .71). We averaged the eight items such that higher scores indicate more confidence in one's ability to achieve specific goals.

Response Efficacy

Following Witte's (1996) risk behavioral diagnosis scale, we assessed response efficacy with three items in which we identified both the recommended behavior and the effect it would have. However, rather than focus on a negative threat that the recommended response would prevent, we phrased the items in a positive direction about how they would be helpful/effective. This choice to use positive phrasing was made to achieve better translation to Khmer. The three items we assessed were, "breaking down big tasks into achievable steps would help me get my dream job," "prioritizing activities to focus on one task at a time is effective in helping me get my dream job," and "writing out a detailed plan will help me get my dream job." Each item was assessed on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*), and the answers were averaged.

Behavioral Intentions

We used three items to measure intentions to plan with the phrasing adapted from Myers and Horswill (2006). Specifically, we asked participants to respond on a 7-point Likert scale from 1 (*strongly disagree*) to 7 (*strongly agree*) whether they intended to, "break down big tasks into achievable steps," "prioritize to focus on one task at a time," and "write out a detailed plan." The three items were averaged to create a single item for behavioral intentions consistent with the Wanji game.[1]

Identification With Characters

To measure identification, we used Tal-Or and Cohen's (2010) 5-item scale. Example items include, "I think I understand the characters I played well" and "While playing, I felt like the characters felt." The five items yielded acceptable reliability (Cronbach's alpha = .68). All items were measured on a 7-point Likert scale, from 1 (*strongly disagree*) to 7 (*strongly agree*). Participants' mean identification was used for analyses.

Narrative Engagement

Busselle and Bilandzic (2009) created a narrative engagement scale with four subscales. A key strength of their measure of narrative engagement is the ability to use the subscales separately. For present purposes, we determined that the emotional engagement subscale overlapped with the identification construct above, and the narrative presence subscale did not translate well to a mobile phone voice interface. Given the choose-your-own-adventure, interactive format in which participants controlled the characters during play, we chose to analyze only the narrative understanding and attentional focus subscales of the narrative engagement scale. Narrative understanding ("At points, I had a hard time making sense of what was going on in the program"—reversed) and attentional focus ("While the program was on, I found myself thinking about other things"—reversed) were each measured with three items each on 7-point Likert scales. The narrative understanding and attentional focus subscaled yielded Cronbach's alphas of .70 and .60, respectively.

Enjoyment

Enjoyment was measured by adapting Tal-Or and Cohen's (2010) 3-item scale. Items included "I would be likely to play the game again" and "I would enjoy playing more of these games." The three items were averaged with higher scores indicating greater enjoyment or willingness to play in future (Cronbach's alpha = .72).

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[1] Cronbach's alpha for response efficacy and behavioral intentions were quite low (.47 and .37, respectively) because three distinct behaviors were measured, rather than a single behavior. We also conducted analyses for each of the three items separately. The results for the overall scale were consistent with the results for both the first and third items. However, there were no statistically significant differences for the second item, prioritizing to focus on one task at a time.

Results

Hypotheses were analyzed with analyses of variance (ANOVAs; see Table 1 for means and standard deviations).

Table 1. Means and Standard Deviations of Outcome Variables by Exposure.

	Control		One play		Two plays		Five plays	
	Female (N = 203)	Male (N = 203)	Female (N = 206)	Male (N = 204)	Female (N = 200)	Male (N = 204)	Female (N = 201)	Male (N = 202)
Identification	–	–	5.7 (0.6)	5.6 (0.8)	5.7 (0.6)	5.7 (0.6)	5.7 (0.7)	5.7 (0.6)
Narrative engagement								
Understanding	–	–	4.7 (1.4)	4.6 (1.4)	4.7 (1.3)	4.7 (1.3)	4.8 (1.4)	4.9 (1.4)
Attentional focus	–	–	4.7 (1.4)	4.6 (1.4)	4.7 (1.5)	4.5 (1.4)	4.4 (1.5)	4.4 (1.4)
Enjoyment	–	–	5.9 (1.0)	5.6 (1.2)	5.7 (1.1)	5.5 (1.1)	5.5 (1.1)	5.5 (1.1)
Self-efficacy	4.4 (0.4)	4.3 (0.5)	4.5 (0.5)	4.4 (0.5)	4.5 (0.4)	4.4 (0.5)	4.5 (0.4)	4.5 (0.4)
Response efficacy	5.8 (0.7)	5.8 (0.8)	5.9 (0.7)	5.9 (0.7)	6.0 (0.7)	6.0 (0.7)	6.0 (0.7)	6.0 (0.7)
Social outcome expectations	5.8 (1.0)	5.8 (1.0)	6.0 (0.8)	5.8 (0.9)	5.9 (1.0)	5.8 (0.9)	5.9 (1.0)	5.7 (1.0)
Behavioral intentions	5.6 (0.8)	5.4 (0.9)	5.7 (0.8)	5.7 (0.9)	5.7 (0.8)	5.6 (0.9)	5.9 (0.8)	5.7 (0.8)

First, we examined the omnibus F to determine whether the experimental condition was associated with each dependent variable. When it was statistically significant, we used a planned contrast to compare the control condition with the average of playing one, two, or five times. For H1, playing the Dream Job Game led to increased self-efficacy, $F(3, 1619) = 7.8$, $p < .001$. Participants in the control condition ($M = 4.4$, $SD = 0.5$) reported significantly lower self-efficacy than those in the play conditions, planned contrast, $t(1619) = 4.7$, $p < .001$. Thus, H1 was supported.

H2 hypothesized that playing the interactive narrative would lead to increased response efficacy. The results for response efficacy were similar to those for self-efficacy. Exposure was statistically significantly associated with response efficacy, $F(3, 1619) = 6.8$, $p < .001$. Participants in the control condition ($M = 5.8$, $SD = 0.7$) reported significantly lower response efficacy than those who played the gamified interactive narrative, planned contrast, $t(1619) = 4.2$, $p < .001$.

H3, suggesting increased plays would lead to more supportive social outcome expectations, was not supported. There was no effect of playing Wanji on social outcome expectations, $F(3, 1615) = 1.0$, $p = .42$.

For H4, playing the Dream Job Game led to increased planning intentions, $F(3, 1619) = 10.7$, $p < .001$. As with self-efficacy and response efficacy, participants in the control condition reported significantly lower story-consistent intentions than those in the play conditions, planned contrast, $t(1619) = 5.2$, $p < .001$).

H5 suggested measures of experiential engagement (identification with characters; narrative engagement; and enjoyment) mediate the effect of the number of interactive narrative plays (one, two, or times) on (a) self-efficacy, (b) response efficacy, (c) social outcomes expectations, and (d) behavioral

intentions. To test this hypothesis, we used Hayes's (2013) PROCESS macro (Model 4) with parallel mediation. We ran the model separately for each dependent variable. The measures of play experience were relevant for and only asked of those participants who played at least one time. The direct effect of number of plays on the potential mediators are necessarily consistent across models, so we report those first (see Figure 1). Number of plays was not associated with identification (b = 0.01, SE = 0.01, p = .23). For narrative engagement, number of plays was positively associated with the narrative understanding subscale such that playing more increased understanding (b = 0.05, SE = 0.02, p = .035). However, participants who played the interactive narrative more frequently had less attentional focus (b = −0.07, SE = 0.02, p = .006). Likewise, as number of plays increased, enjoyment decreased (b = −0.06, SE = 0.02, p = .002).
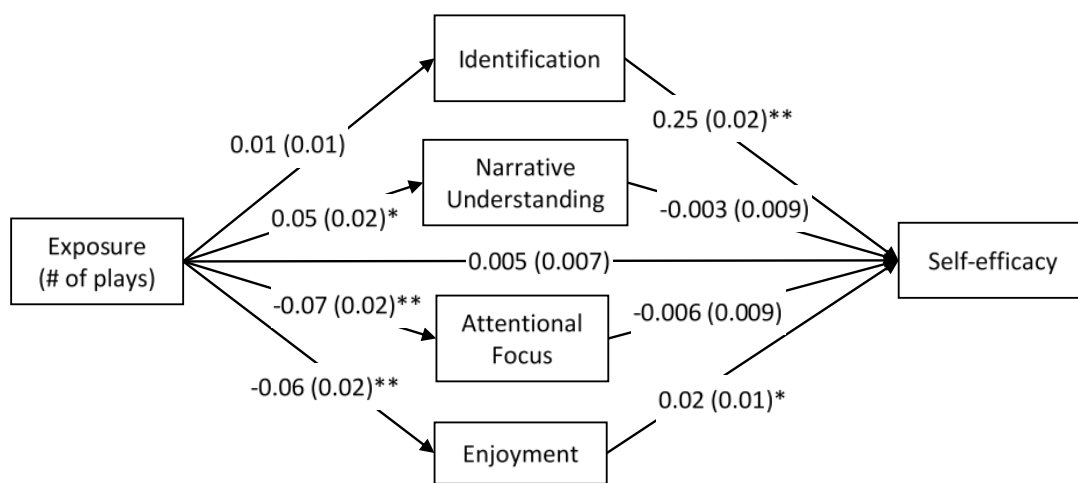
*Figure 1. Model 1. Effects on self-efficacy. *p < .05. **p < .01.*

We report the direct and indirect effects of number of plays on each dependent variable. There was no direct effect of exposure on self-efficacy (b = 0.005, SE = 0.007, p = .47). Moreover, identification, narrative understanding, and attentional focus did not mediate this relationship. However, enjoyment partially mediated the relationship between number of plays and self-efficacy such that more plays led to lower enjoyment and subsequently lower self-efficacy (95% bias-corrected CI [−0.004, −0.0001]; specific indirect effect size = −0.001, Bootstrapped SE = .0008).

Model 2 shows the mediation test for response efficacy (see Figure 2). Identification had a positive direct effect on response efficacy (b = 0.32, SE = 0.03, p < .0001). Likewise, attentional focus had a positive direct effect; however, given the negative direct effect of exposure on attentional focus (b = 0.03, SE = 0.01, p = .02), attentional focus had a very small, negative specific indirect effect on response efficacy (indirect b = −0.02, SE = 0.01, 95% CI [−0.006, −0.0004]). Overall, number of plays did not have a statistically significant total effect on response efficacy (p = .10).
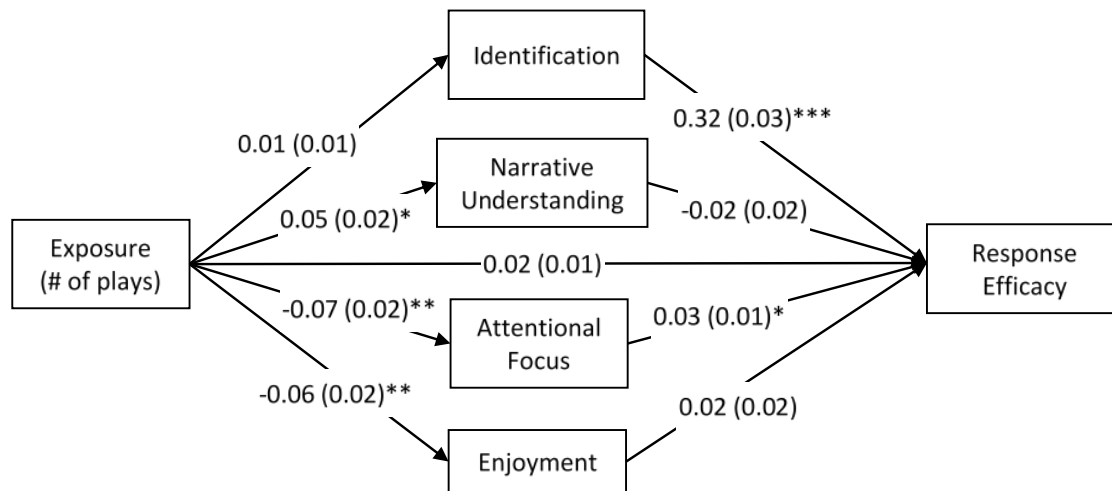
Figure 2. Model 2. Effects on response efficacy. *p < .05. **p < .01. ***p < .001.

Model 3 examines the relationships among exposure, potential mediators and social outcome expectations (see Figure 3). As for response efficacy, identification had a positive direct effect on social outcome expectations (b = 0.19, SE = 0.04, p <.0001). However, narrative understanding, attentional focus, and enjoyment were not associated with social outcome expectations. Despite this, narrative understanding partially mediated the relationship between exposure and social outcome expectations (specific indirect b = 0.002, SE = 0.001, 95% CI [0.0001, 0.006]). Overall, number of plays did not have a statistically significant total effect on social outcome expectations (p = .24).
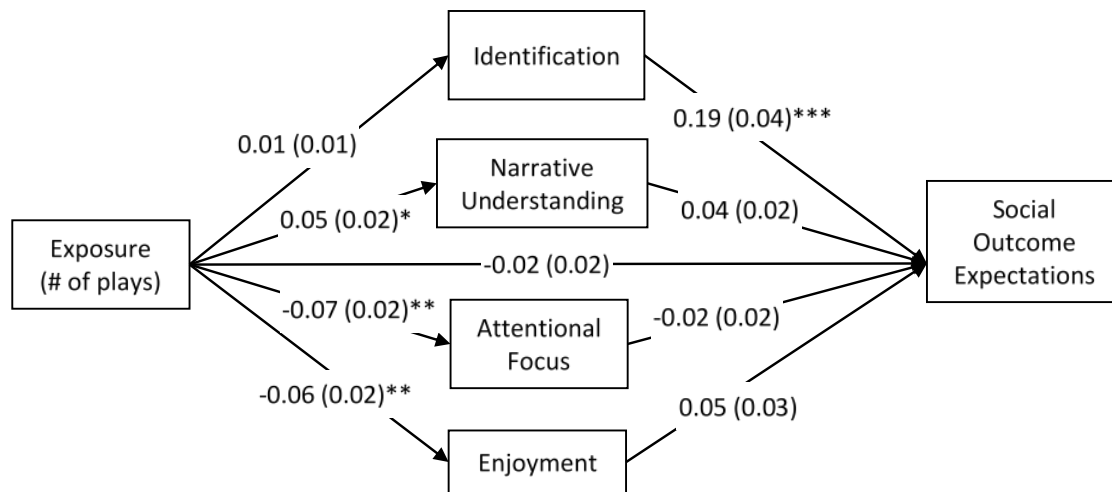
Figure 3. Model 3. Effects on social outcomes expectations. *p < .05. **p < .01. ***p < .001.

Finally, we examined whether number of plays and experiential engagement were associated with behavioral intentions (see Figure 4). Again, identification had a positive direct effect on behavioral intentions (b = 0.39, SE = 0.04, p < .0001). Likewise, attentional focus was positively associated with behavioral intentions (b = 0.39, SE = 0.04, p < .0001), yielding a negative specific indirect effect of attentional focus on behavioral intentions (specific indirect b = −0.003, SE = 0.002, 95% CI [−0.007, −0.0004]). Moreover, number of plays had a positive direct effect on behavioral intentions (b = 0.03, SE = 0.01, p = .04). Taken together, number of plays had a statistically significant total effect on social outcome expectations (b = 0.03, SE = 0.01, p = .04).
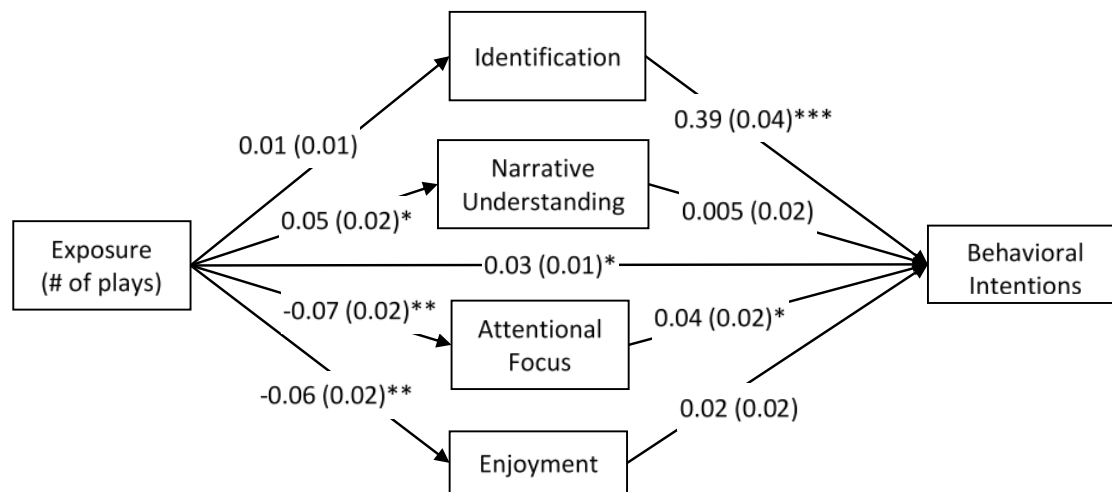
Figure 4. Model 4. Effects on behavioral intentions. *p < .05. **p < .01. ***p < .001.

Discussion

The present results support the promise of interactive narratives using basic mobile phones for social and behavior change. It is worth exploring why this medium (using basic telephony to provide interactive, educational stories through spoken audio) was utilized. Social and behavior change interventions often fail to reach audiences or go "the last mile." The Wanji format was designed for marginalized populations who have a basic cell phone, but little access to training/education, particularly those who are rural, homebound, have limited literacy, and/or limited access to mobile computing or other expensive technology. Indeed, the incredible reach of radio in developing countries demonstrates that spoken content in a local language using affordable, accessible technology is an ideal means to reach large populations at the bottom of the economic pyramid. Based on these considerations, Wanji was designed to combine the aural nature of radio, the accessibility and ubiquity of basic mobile cell phones, the engagement of narrative, and the teaching potential of interactivity. First piloted in the Teso region of Uganda in 2015 (Sparks, 2016), this interactive format has since been launched in 15 developing countries in partnership with Viamo's toll free 3-2-1 service and has reached 1.5 million individuals to date on topics including financial savings, sexual and reproductive health, agricultural practices, public health, and COVID-19 prevention. While pilot and

small-scale studies have been conducted internally, this experiment with the Dream Job Game represents the first rigorous experimental assessment of the impact of this interactive format.

Thus, this study explored the impact of playing an interactive, choose-your-own-adventure style narrative on players' feelings that they could achieve their dream career. Compared with a no-exposure control, playing the Dream Job Game yielded more intent to plan, higher self-efficacy, and higher response efficacy. As predicted by Green and Jenkins (2014), user control of character actions seems to enhance the narrative experience. Even minimal efforts such as making binary choices for a character may be able to generate an interactive experience. In other words, allowing audience members to make decisions for the characters (even if those decisions are fairly innocuous) may be effective in helping audience members to increase their own self-efficacy and plan for their own goals.

However, playing the gamified interactive narrative did not significantly increase participants' social outcome expectations that their friends and family would approve should they succeed in attaining their own "dream job." It should be noted that these results stand in contrast to other narrative persuasion research informed by social cognitive theory where social outcome expectations were successfully affected (Frank et al., 2012). The mechanism by which such change occurs through the symbolic environment is typically through the modeled reaction of others in the story, which was largely absent in the Dream Job Game or by the social environment surrounding exposure to the message (Bandura, 2002). Indeed, Bandura (2002) highlighted two pathways for behavioral change; the first is through an individual having direct exposure to an intervention, while the second indirect path is through the individual's social system, such as family and friends discussing the intervention. Solitary choose-your-own-adventure game play in a laboratory environment may not be as well suited to changing social norms as it is to the more individual-level intentions and perceived efficacy. By allowing players to guide character choices, these interventions may do especially well in motivating individual level planning and decision making. Likewise, this format of interactive narrative, which demonstrates overcoming obstacles, is particularly well suited to increasing feelings of efficacy and modeling outcomes.

In addition to examining the effects of playing Wanji, we also tested the effects of varying levels of intervention exposure. While playing more frequently was associated with greater narrative understanding, it was also associated with less attentional focus and less enjoyment of the interactive narrative. Given the importance of attention to retention and subsequent cognitive processes, loss of attentional focus at higher levels of play suggests that no new information is being rehearsed or recorded.

Surprisingly, identification with the Dream Game characters was not associated with the number of plays. This may be because participants who played the gamified, interactive narrative just once reported identification with the single character they selected. However, participants who played two or five times may have played different characters and were thus asked the extent to which they identified with the characters overall. Alternatively, it may be the case that when a player is actively making choices for a particular character, the construct of identification may become blurred. Thus, identification may not increase with additional plays because one does not typically identify with oneself. Taken together, these results suggest that a repeated experience helps to better encode behavior as Bandura (2004b) suggested

in noting the importance of repetition for memory. However, in this particular intervention, participants may have been bored by more numerous exposures to similar content.

For the most part, the measures of experiential engagement did not mediate the relationship between number of times playing and the outcome variables. Narrative understanding slightly positively mediated the relationship between plays and social outcome expectations; enjoyment slightly negatively mediated the relationship between plays and self-efficacy; and attentional focus slightly negatively mediated the relationship between plays and both response efficacy and behavioral intentions.

Although number of plays was not associated with identification, identification was the strongest driver of the outcome variables. Previous research has suggested that even perceived interactivity that does not yield any significant difference in outcomes nevertheless promotes identification (Walter et al., 2017); thus, although exposure amount did not lead to greater identification, the direct effect of identification on outcomes is likely strengthened by interactivity. Future research might include a non-interactive narrative condition to confirm this relationship. Despite the very small effects in this study, number of plays had a direct relationship with behavioral intentions. In other words, in line with Bandura (2002), increased message frequency through repeated play yielded more positive effects on behavioral intentions. Whereas repeated exposure was not necessary for cognitive effects on perceived efficacy, greater exposure was important for the higher level behavior change.

Limitations and Future Research

This study used a between-subjects experimental design that relied on control of the primary independent variable, the number of times the gamified, interactive narrative was played. This strong experimental design with randomization to condition allows for causal statements that attribute the change in outcomes to the differing number of plays. However, such a design necessarily sacrifices some realism. Participants played in a single sitting, and those who played five times participated longer than those in the smaller number of plays. Moreover, the three career scripts allowed for playing different characters, but the story lines were all similar with the same key messages to maximize experimental validity. The lack of increase with five plays may be due to boredom or reactance, as this would involve guiding the same character multiple times. A different number of scripts or characters might have led to a different engagement threshold. Future research should determine whether more variation may counteract the decreases in motivation to continue playing as the number of plays increases.

Moreover, the effect sizes we found for many of the hypotheses were small, even smaller than those in Yang and colleagues (2019). The largest effects were the relationships between identification and social cognitive theory outcome variables. This contrasts with the small effects of playing the gamified interactive narrative. Such effect sizes may be due to the short exposure to the narrative. Further research must be done to examine how these effects translate into practical change outside of the laboratory context.

Future research into interactive narrative interventions should also seek to understand how the complexity of the story line and the number of alternative paths affects enjoyment and learning. This project led all participants to the same ending, so that each would be exposed to the seven key messages included

in the seven levels. This constraint may have reduced participants' feeling of control over the gamified, interactive narrative. Participants may have enjoyed repeated plays more if the ending varied each time. Future research should examine the trade-offs in ensuring that players hear key messages and allowing players' choices to feel more realistic even if this leads to negative outcomes.

This research design was cross-sectional. Future research should examine the long-term effects of exposure. If increases in behavioral intent to pursue career goals are sustained, short-term compromises on enjoyment may not matter as much. This project used a single Wanji gamified interactive narrative and only examined Cambodian youths. More research must be done to determine whether other interactive narratives produce similar results or if the results herein are specific to the narrative and context studied.

Conclusion

Overall, this study adds to the body of evidence supporting the use of gamified, interactive narratives for behavior change. Social and behavior change communication approaches that take into consideration audience enjoyment and engagement offer far more potential than content that is didactic, distant, and dry. Communication approaches that fail to employ narrative and that evoke no emotional response from the audience may be less powerful than those that do. This engagement can be further enhanced through the addition of interactivity in which the audience assumes the role of the protagonist. In this interactive format, identification is especially strongly related to perceived efficacy, social outcome expectations, and behavioral intentions. In considering how much exposure to recommend, intervention designers must balance the importance of repetition for learning and behavioral change against the possible consequences of decreasing enjoyment and boredom.

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