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<RRH>Facilitating Communicative Environments</RRH>

<BOOK-PART-META><LBL>**9**</LBL>

<TITLE>**FACILITATING COMMUNICATIVE ENVIRONMENTS**</TITLE>

<SUBTITLE>**An Exploration of Game Modalities as Facilitators of Prosocial Change**</SUBTITLE>

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<ABSTRACT><TITLE>**Abstract**</TITLE>

Complex social issues are often inaccessible for numerous reasons (e.g., fear), but through enacted experiences individuals are able to access attitudes, beliefs, and behaviors with mitigated negative consequences. In these spaces, individuals are transported to fictional yet probable worlds (via persuasive narrative) and engage in role playing as a mechanism of change rehearsal. In this way, games function as communicative channels that stimulate cognitive, emotional, and physical engagement. This chapter addresses the innovative ways serious games address complex social issues by detailing the research and design practices, theoretical frameworks, and applied strategies. Additionally, core mechanisms of serious games and their roles as attitudinal and behavioral change agents are discussed.</ABSTRACT>

<BODY>The field of serious games, which includes persuasive games, games for health, military training, games for social impact, and educational games, has grown substantially over the past few decades. For instance, organizations (e.g., Games for Change) and academic research spaces (e.g., Tiltfactor, Play Innovation Lab, PEAKS Lab) have been advocating developing, implementing, and evaluating games for prosocial attitudinal and behavioral change. For example, the game *Buffalo* by Mary Flanagan and the Tiltfactor Lab was designed to help players explore and challenge their implicit biases. Likewise, other games have been developed to enhance health-related behaviors and attitudes, such as *Re-Mission* by HopeLab and *Por Nuestras Calles* ([Wendorf Muhamad, 2016](#LinkManagerBM_REF_tMqErVhe)). *Re-Mission* gives children who are being treated for cancer the opportunity to fight different types of cancer in a digital world, which ultimately increases the child’s compliance to medical treatment. *Por Nuestras Calles* ([Wendorf Muhamad, 2016](#LinkManagerBM_REF_tMqErVhe)) is a game designed to promote prevention of commercial sexual exploitation of children and views social justice as essential to well-being on *micro*-, *meso*-, and *macro*-levels of society. Independent of their scope, games such as these may act as immersive experiences in which individuals are able to gain a more robust understanding—through providing an embodied experience—of complex social issues. Exactly how games are able to teach social issues, change attitudes and behaviors, or convey information has been of great interest to researchers and practitioners alike. Scholars (e.g., [Carcioppolo et al., 2015](#LinkManagerBM_REF_ohQoCLyG); [Farber & Schrier, 2017](#LinkManagerBM_REF_Vt1wClG6); [Glesne, 2011](#LinkManagerBM_REF_RYBJZRTN); [Schrier, 2019](#LinkManagerBM_REF_2MGkfHey); [Wendorf Muhamad, 2016](#LinkManagerBM_REF_tMqErVhe), 2019) argue that this is possible, in part, because games present individuals with plausible yet imaginative situations—fictional scenarios that hold bits of truth ([Wendorf Muhamad, 2016](#LinkManagerBM_REF_tMqErVhe)). From this vantage point, games are then able to bring familiarity to otherwise less practiced attitudes, behaviors, and scenarios. Moreover, through a gameplay session, individuals may suspend their previously held schemas and ideologies, which allows for messages to permeate with less resistance ([Wendorf Muhamad, 2016](#LinkManagerBM_REF_tMqErVhe); 2019). Beyond any possible changes that occur while playing, games have been found to have transformative effects that extend beyond gameplay sessions, influencing attitudes and behaviors of individuals in real life ([Mitgutsch & Alvarado, 2012](#LinkManagerBM_REF_MWUkmY1b)). This means that beyond servicing as a knowledge acquisition tool (i.e., learning a specific behavior), games may also elicit elaborative processes (rehearsal and problem solving) that could result in direct access to previously inaccessible psychosocial environments ([Ritterfeld et al., 2009](#LinkManagerBM_REF_rvwAgp8T); Wendorf Muhamad, 2019; [Wideman et al., 2007](#LinkManagerBM_REF_nfalYG27)). However, there are also limits to whether games may affect learning and behavioral change ([Farber & Schrier, 2017](#LinkManagerBM_REF_Vt1wClG6); [Schrier, 2018](#LinkManagerBM_REF_7qGTEamU)).

Games function as communicative channels for hedonic processing in which the gaming experiences are leveraged to stimulate cognitive, emotional, and physical engagement. In this chapter, we provide an overview of using games for social change, including the key relevant theoretical foundations from the field of communication. In addition, we describe three different core mechanics of games that have been identified as effective in supporting behavioral and attitudinal change and information acquisition.

<HEAD1><LBL>**1.**</LBL><TITLE>**Games for Social Change**</TITLE></HEAD1>

Digital games for prosocial change have been studied and found to be efficacious in various contexts ([Baranowski et al., 2008](#LinkManagerBM_REF_BZdhXTat)) and across multiple facets (i.e., cognitive, social, behavioral) ([Knutz et al., 2015](#LinkManagerBM_REF_84MLehij); [Lee & Peng, 2006](#LinkManagerBM_REF_Zr6jcc9B)). For instance, some games have been effectively designed around specific outcomes such as reduction of stigmatized beliefs and biases (e.g., *Playing it Safe!*, *Buffalo*). In this way, games can function as persuasive tools—elaboration process activators—that seek to form and transform attitudes and behaviors ([Peng et al., 2010](#LinkManagerBM_REF_Q59HAeMm)), not only through their messaging and content, but also through their mechanics and ludic structures ([Bogost, 2007](#LinkManagerBM_REF_n1H55gvf)). As vehicles for prosocial messages, games may be able to serve to disrupt embedded systems with minimal reactance due to their unobtrusive and persuasive possibilities housed within an engaging framework. This is achieved, in part, through inviting players to problem recognition and problem solving, on-the-spot decision making, and other mechanisms, while absorbed in game narrative and transported to possible scenarios in which their action/inaction has more immediate consequences ([Gee, 2007](#LinkManagerBM_REF_fo1srrga)).

Another unique feature of games is their ability to humanize data through the inclusion of characters and scenarios that embody statistics and copious amounts of information. For example, the prevalence of substance misuse/abuse among a population can be simulated through certain forced choices (i.e., assigning roles to a percentage of players) or mechanisms such as stacking card decks with representative statistics on the probability of addiction. A game-like experience, *Parable of the Polygons*, uses shapes and colors to represent systemic bias and how it affects where people live ([Schrier, 2019](#LinkManagerBM_REF_2MGkfHey)).

Another way in which games stimulate elaboration of descriptive and injunctive norms is through employing a positive deviance framework. *Positive deviance* refers to behaviors that are deviant from the group norm but have positive outcomes, and this can be demonstrated through game narrative, nonplaying characters (NPCs), and other mechanisms ([Marsh et al., 2004](#LinkManagerBM_REF_A2ikooqv)). Although present in both analog and digital games, games in which multiple players are proximally simulated may have additive effects as they allow for collaborative efforts that foster socialization and social learning ([Sabido, 2004](#LinkManagerBM_REF_W5hf2tuz)). These purposeful design choices enable games to transcend attitudinal barriers such as biases, held stigmatic beliefs, as well as emotive ones (i.e., fear), making serious games particularly efficacious in simulating social issues that might activate greater reactance or othering.

<HEAD1><LBL>**2.**</LBL><TITLE>**Digital Games**</TITLE></HEAD1>

Digital games refer to any game that is played through some type of digital device, as opposed to analog games, such as board or card games, which do not require any digital media to play them. According to current research, approximately half of all Americans (49 percent) have played a digital game on their computer, smartphone or handheld device, TV, or through a game console ([Duggan, 2015](#LinkManagerBM_REF_YOtqZ1TZ)), making such games ripe for exploration as tools for prosocial attitudinal and behavioral change. Although sharing basic characteristics, digital games are qualitatively different than analog in that they have the advantage of technological innovations that increase interactivity. These features could include the communicative responsiveness of the game (e.g., two-way communication among players, between players and facilitator), connectivity to a greater number of players through online platforms, and immediacy of feedback ([Baldwin & Dandeneau, 2009](#LinkManagerBM_REF_jsfsLBvs); [Baranowski et al., 2016](#LinkManagerBM_REF_6sfMjgQf)). Digital “serious games” refer to games designed specifically for learning purposes across a variety of topical areas and settings (e.g., schools, military) ([Baranowski et al., 2008](#LinkManagerBM_REF_BZdhXTat); [Schrier, 2018](#LinkManagerBM_REF_7qGTEamU)).

<HEAD2><LBL>**2.1**</LBL><TITLE>**Digital Games for Health**</TITLE></HEAD2>

Although digital serious games have been applied to a wide variety of contexts there seems to be particular interest in the role of games as tools for health outcomes. Among health-based interventions, games have been used for individual-level psychological, behavioral change, and/or treatment (e.g., *Re-Mission*), as well as for prevention efforts and training of healthcare professionals ([Rahmani & Boren, 2012](#LinkManagerBM_REF_USb454xO)). Health-promoting serious digital games include: substance abuse prevention campaigns ([Klisch et al., 2012](#LinkManagerBM_REF_RwiKubSs)); illness-specific or single health educational games, such as those for diabetes ([Baranowski et al., 2008](#LinkManagerBM_REF_BZdhXTat)) and obesity ([Guy et al., 2011](#LinkManagerBM_REF_n8IxIS2g)); or games focused on specific populations, such as sexual health among adolescents ([Guse et al., 2012](#LinkManagerBM_REF_6ve5cFwE)).

<HEAD2><LBL>**2.2**</LBL><TITLE>**Digital Games for Empathy and Human Connection**</TITLE></HEAD2>

In addition to health-related change, games have also been used to support social and emotional related outcomes, such as increasing empathy, compassion, and connectedness. Elements of games that may support greater practice of empathy include narrative, immersive, role playing/role taking, communicative, and expressive elements ([Farber & Schrier, 2017](#LinkManagerBM_REF_Vt1wClG6); [Schrier, 2019](#LinkManagerBM_REF_2MGkfHey); [Schrier & Farber, 2018](#LinkManagerBM_REF_25OEukdZ)). For instance, some games may help players to better understand their own and others’ emotions, such as *That Dragon*, *Cancer*, or *Depression Quest* (Farber & Schrier, unpublished manuscript; [Schrier, 2015](#LinkManagerBM_REF_6calKjqr)). Other games may help players connect through collaborative tasks and problem solving, such as *Way* (Schrier & Shaenfield, 2015) or practice perspective-taking and other ethics-related skills, such as in the case of *Fable III* ([Schrier, 2017b](#LinkManagerBM_REF_BkhdhvWN), [2015](#LinkManagerBM_REF_6calKjqr)).

<HEAD2><LBL>**2.3**</LBL><TITLE>**Digital Games for Real-World Problem Solving**</TITLE></HEAD2>

Beyond just trying to change behavior and attitudes at the individual level, some games are designed to make real-world social and scientific change. In other words, these games aim to advance new knowledge, including greater understanding of humanity, so that we can better design behavioral and social interventions moving forward ([Schrier, 2016](#LinkManagerBM_REF_jfnU3XDc), [2017a](#LinkManagerBM_REF_ALHjNb27)). For instance, some games aim to gain further scientific knowledge, such as *Foldit*, which brings together human players with powerful computers to solve unknown protein structures ([Eiben et al., 2012](#LinkManagerBM_REF_RyYjLILJ)), or *Quantum Moves II*, which invites participants to contribute to real-world quantum physics research through game play (SciAtHome, 2019). Some of these games also aim to solve social and humanistic problems, such as *The Restaurant Game*, which seeks to learn how players move through a “restaurant schema” ([Schrier, 2016](#LinkManagerBM_REF_jfnU3XDc)), or *Wordrobe*, which investigates how players use words to gain natural language processing ability (<URI>http://wordrobe.housing.rug.nl/Wordrobe/public/HomePage.aspx</URI>, 2019).

<HEAD1><LBL>**3.**</LBL><TITLE>**Theoretical Foundations**</TITLE></HEAD1>

Serious games have been often considered a modality within the entertainment-education (EE) framework. EE functions as a two-fold communication strategy leveraging the positive effects (i.e., promotion of attitudinal and behavioral change) of presenting educational content with entertainment media channels ([Singhal et al., 2004](#LinkManagerBM_REF_GLbnN1Ye)). Persuasive narrative along with pictorial information create engaging environments that stimulate elaboration ([Singhal et al., 2004](#LinkManagerBM_REF_GLbnN1Ye)). Closely aligned with EE has been [Bandura’s (1986)](#LinkManagerBM_REF_oqr81ltr) social cognitive theory (SCT). SCT posits that modeling has an effect on self-efficacy, an individual’s belief in their ability to accomplish a task/meet goals, and that this in turn may have an effect on behavioral change. Simply stated, when individuals observe others engage in a particular behavior they may be more willing to try out these behaviors themselves. In particular, studies have found that change in attitudes precede changes in self-efficacy and behavioral intention, the latter being a significant predictor of future behavioral change ([Fishbein & Ajzen, 1975](#LinkManagerBM_REF_3b3A7Eyo); [Prochaska et al., 1992](#LinkManagerBM_REF_iJQ3ItPg); [Slater & Rouner, 2002](#LinkManagerBM_REF_jw7wG9td)). Although EE and SCT have served in the development and evaluation of multiple games, given the lack of theoretical principles they do little in explicating the function(s) and effect(s) of serious games. To examine how serious games might activate elaboration that leads to change, alternate persuasive models can be helpful. These models include the extended elaboration likelihood model (EELM), the entertainment overcoming resistance model (EORM), and the extended parallel process model (EPPM).

<HEAD2><LBL>**3.1**</LBL><TITLE>**Extended Elaboration Likelihood Model**</TITLE></HEAD2>

The elaboration likelihood model (ELM) innovated the field of persuasion studies by presenting changes based on central (attention to message) or peripheral processing (attention to cues) ([Petty & Cacioppo, 1986](#LinkManagerBM_REF_IQEdZiGd)). In this way, ELM offers a lens by which to examine the relationship between persuasive and/or prosocial subtext and accompanying information and/or media in the message. However, ELM presented a limited view of how unobtrusive messages—not overly persuasive messages but more subtle messages such as positive deviance—might impact individuals. In an effort to provide a more robust understanding of how individuals might process messages comes EELM, an extension of ELM. EELM goes beyond traditional persuasive messages to include key constructs such as absorption and others which are discussed in greater detail in the following sections.

EELM is an audience-centered model that focuses on when and why observable behaviors might be imitated. As previously discussed SCT ([Bandura, 1986](#LinkManagerBM_REF_oqr81ltr)) aims to explain how observing an individual might lead to a change in the observer; however, it does not explain why observers are likely to change only *some* behavior. Studies found that not all behaviors are imitated because the observer needs to observe *and* be motivated to change. This critical distinction—that exposure and motivation must both be present—is core to EELM. Specifically, EELM explores how reactance to messages might impede motivation to enact observed behavior ([Moyer-Gusé, 2008](#LinkManagerBM_REF_TjkdW4EL); [Slater & Rouner, 2002](#LinkManagerBM_REF_jw7wG9td)). Reactance, also known as message resistance, refers to the process by which individuals reject messages due to perceived threat, overtness of message, or other factors ([Buller et al., 1998](#LinkManagerBM_REF_KliHrzeR)). Scholars (e.g., [Knowles & Linn, 2004](#LinkManagerBM_REF_NQj63xS6)) have argued that persuasion is not possible when reactance is present. Psychological reactance has been found (e.g., [Brehm, 1966](#LinkManagerBM_REF_L1NPJm1I)) to be a protective response when an individual feels forced to comply, resulting in a boomerang effect. EELM accepts reactance as a mediating force that negatively impacts outcomes and must therefore be addressed for persuasive effects to be possible ([Slater & Rouner, 2002](#LinkManagerBM_REF_jw7wG9td)). According to EELM, engagement, or the absorption into persuasive narrative content, serves to counter reactance as an individual who is transported to a story is less likely to be critical of the embedded messages ([Shrum, 2004](#LinkManagerBM_REF_QcufiNOR); [Slater & Rouner, 2002](#LinkManagerBM_REF_jw7wG9td)). Moreover, EELM posits that certain constructs (i.e., identification, homophily—discussed more fully in subsequent sections) allow for this process to occur.

<HEAD1><LBL>**3.2**</LBL><TITLE>**Entertainment Overcoming Resistance Model**</TITLE></HEAD1>

Although EELM acknowledges the role of psychological reactance limiting persuasive efforts, it does not explore the causes of reactance. Filling this gap would be EORM, which states that media when framed within entertainment frameworks is less likely to encounter resistance ([Moyer-Gusé, 2008](#LinkManagerBM_REF_TjkdW4EL)). Further, it stipulates that when reactance is low there is potential for greater effects of prosocial messages leading to significant changes in attitudes and/or behaviors ([Moyer-Gusé, 2008](#LinkManagerBM_REF_TjkdW4EL)). According to the author, reactance to perceived threat is mitigated through the increase of narrative enjoyment. Therefore creating rich and complex entertainment environments would be less likely to activate feelings of cohesion or force (limited freedom of choice) that might lead to reactance. Similarly to EELM, EORM examines specific constructs that might play a role in these processes. These will be further discussed in the following sections.

<HEAD1><LBL>**3.3**</LBL><TITLE>**Extended Parallel Process Model**</TITLE></HEAD1>

EPPM examines the unintended consequences of certain types of appeals (i.e., fear messages) when an individual’s perceived threat is stronger than their perceived efficacy. In an effort to manage the unpleasant feelings of fear that may arise, individuals derogate the message, treat it as pure manipulation, or avoid thinking about the threat and the ways to prevent it ([Witte, 1994](#LinkManagerBM_REF_goxFlPjh)). Therefore, EPPM is concerned with the degree of perceived threat (assessed via perceived severity and perceived susceptibility) an individual may feel stemming from an emotional response (i.e., fear) to a message, and how that might impact motivation to engage in behavioral change ([Witte, 1994](#LinkManagerBM_REF_goxFlPjh)). Given EPPM predicts that fear may lead to self-defeating actions and that efficacy (response efficacy and self-efficacy) may cause self-protective behavior to emerge, an efficacious message would contain a balance of both threat and efficacy.

<HEAD1><LBL>**3.4**</LBL><TITLE>**Other Relevant Theories**</TITLE></HEAD1>

In addition to traditional persuasive theories, it is important to consider other communication theories within gaming contexts. If a serious game is designed as an intervention tool for marginalized populations, social identification theory (SIT) is a key theory to consider. SIT proposes that who we consider ourselves to be often relies on our perceived membership in specific groups (Taijfel & Turner, 1979). This identification is a constantly changing process involving more than one dimension (Van Zoonen, 2013). Even though the identification of the individual is dynamic, SIT focuses on the macro-group structures which affect the perceived membership of the group and trickle down to the individual (Turner, 1999). Part of sustaining a group is the belief that your group is superior to other groups, also called positive distinctiveness (Taijfel & Turner, 1979). Specifically, with marginalized populations, there are negative perspectives confronting the members of the group. In order to achieve positive distinctiveness, there are a few strategies individuals can use: social creativity (focusing on the positives of the group in order to appear more favorable), social competition (competing with the other groups by showing ingroup favoritism), and individual mobility (leaving the group) (Taijfel & Turner, 1979). Before creating the serious game for the specific population, it is imperative to explore the social identification of the group. However, not all members of a social group achieve positive distinctiveness in the same way, and homogenizing a group could lead to message resistance.

A critical construct to consider when creating a serious game is the idea of sensemaking or understanding how audiences rationalize their actions and experiences (Weick, 1979). Sensemaking enables scholars to analyze how the players understand their self, the environment, and the appropriate attitudes and behaviors within that context (Weick, 1993). How the players of a game understand their character, the rules of social behavior within the game environment, and the expected behaviors or attitudes within that context provides a greater understanding of the possible persuasive outcomes of the game.

If a serious game is designed to be played with multiple players and played within a social context, how the players interact with one another also needs to be examined. Applying interpersonal communication theories can help within the game design. One such theory is the uncertainty reduction theory (URT), which posits that as humans we want to feel like we have knowledge and can predict the behaviors of those around us in order to establish certainty (Berger & Calabrese, 1974). Individuals don’t enjoy feeling uncertain, so we take actions to reduce that uncertainty (Berger & Calabrese, 1974). Specifically, when in gaming environments where the normal standards of behavior might not fit social standards, we are especially motivated to reduce that uncertainty (Berg, 1979). There are seven axioms (or variables) that individuals can use to help reduce uncertainty. These axioms include verbal communication, nonverbal communication, information seeking, self-disclosure, reciprocity, similarity, and liking (Berger & Calabrese, 1974). By including game mechanics that satisfy these variables, audience members will feel more certain within the game context. In Table 9.1 we summarize the major contribution of each major theory discussed.

<TABLE-WRAP><LBL>TABLE 9.1</LBL> <TITLE>Contributions of persuasive theories</TITLE>

| <TABLE>**Entertainment-education** | **Social cognitive theory** | **Extended elaboration likelihood model** | **Entertainment overcoming resistance model** | **Extended parallel process model** |
| --- | --- | --- | --- | --- |
| Functions as a two-fold communication strategy leveraging the positive effects of presenting educational content with entertainment media channels. | Modeling attitudes or behaviors has an effect on self-efficacy, and this may have an effect on attitudinal and/or behavioral change. | For an observed attitude or behavior to be imitated both exposure (to desired attitude/behavior) and motivation must be present. | Rich and engaging media environments can reduce message resistance (or psychological reactance). | Greater levels of increased perceived threat that result in emotional responses to messages might impact motivation to engage with media, and thus attitude/behavioral change.  </TABLE> |

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<HEAD1><LBL>**4.**</LBL><TITLE>**Core Mechanisms of Serious Games**</TITLE></HEAD1>

While the models discussed serve to explicate how two-fold media—media with the purpose to teach and persuade—might enhance attitudinal and behavioral change, the process of actively constructing the learning experience through, for instance, problem solving, elaboration, and other key factors make serious games different from other media (Wendorf Muhamad, 2019). Furthermore, games help to meet real-life motivational needs, such as autonomy, competence, and relatedness, which help to impact attitudinal and behavioral change ([Visch et al., 2013](#LinkManagerBM_REF_Du846JsB)). Traditional EE media (e.g., telenovela), however, invites participants to consider through an imaginative process that they are a character, are like a character, or know a character more personally while games move away from just “if I were them” and also present players with an opportunity to engage with the story from the position of “I am them.” The *lived experiences* that games facilitate may also allow for a deeper and more personal level of understanding of someone else’s perspective and views. According to [Peng et al. (2010)](#LinkManagerBM_REF_Q59HAeMm) some games accomplish this by inviting participants to engage cognitively and emotionally (form attachment) with characters. This in turn, the authors argue, may motivate individuals to internalize the character’s goals, thereby becoming shared goals ([Peng et al., 2010](#LinkManagerBM_REF_Q59HAeMm)).

Perhaps as important as what games do is *how* they do it. According to [Charsky (2010)](#LinkManagerBM_REF_b7AHU5uO) there are major game mechanisms across serious games. Below we describe the most salient.

1. **Competition**. First, games invite players to compete, activating a desire to win. Because winning alone is not sufficient motivation, games drive behavior through goals and/or actions that tie directly to a player’s achievement.
2. **Goals**. Second, by creating experiences structured around specific goals, participants gain information useful for future problem solving. It is in these goals that game designers have the opportunity to encourage moments of deep reflection. These enable individuals to rehearse skills and processes related to a particular attitudinal or behavioral change. Additionally, providing immediate feedback helps internalize this learning ([Gee, 2007](#LinkManagerBM_REF_fo1srrga)), which in turn might lead to deeper levels of engagement.
3. **Rules**. Third, games contain rules. Rules within games impose constraint on player actions that rarely can be changed. On the surface level rules are important because they serve to facilitate gameplay session (i.e., provide instruction); however, they are also critical in representing realities ([Alessi & Trollip, 2001](#LinkManagerBM_REF_SFXg3GiS)). By providing or limiting choices games can serve to simulate real life (e.g., structural or systemic inequalities) (Wendorf Muhamad, 2019).

It is important to mention that beyond mechanisms serious games also serve to engage individuals within particular contexts that might otherwise be inaccessible ([Carcioppolo et al., 2015](#LinkManagerBM_REF_ohQoCLyG)). For instance, in game environments, participants can have the opportunity to execute higher levels of cognition and access alternate schemas from those they typically use, while mitigating the risks associated with them. Games such as *Reconocer* ([Wendorf Muhamad, 2016b](#LinkManagerBM_REF_uTMm4BC8)) exemplify how this mechanism might be beneficial. Research has suggested that child survivors of interfamilial sexual assault often do not identify as “victim” or “survivors” as sexual relations among family members are often normalized; therefore, therapeutic processes must be careful to not traumatize/retraumatize individuals. *Reconocer* was developed to better support this group of child survivors. It is a tabletop facilitated game led by a mental health professional,which presents scenarios in which game mechanisms (e.g., pulling a random scenario card) limit player choices to create purposeful, yet previously inaccessible, moments of elaboration. For example, a player might select a card that reads “Your friend tells you that her family member’s behavior makes her uncomfortable. She wishes to tell her parents about it. What would you do to help this friend?” In this scenario, the narrative is presenting an option that a player might not have in real life, asking the player to elaborate on how they might handle this situation. Serious games have the unique advantage of being able to generate spaces of suspended ideology where individuals are able to explore alternative ways of being ([Swain, 2007](#LinkManagerBM_REF_hY1lg5eW); [Wendorf Muhamad, 2016](#LinkManagerBM_REF_tMqErVhe)). This is important not only because perceived threats such as “The perpetrator will know I told someone” and “I feel shame” can be discussed with mitigated psychological and/or emotional risk. The character (*the role*) serves to create necessary distance between the individual and the targeted behavior. Also, the game allows for role rehearsal, giving the player the ability to practice behaviors that might be useful in the future and have limited repercussions (i.e., teaches the child the necessary steps to reporting the incident) ([Stokes et al., 2006](#LinkManagerBM_REF_RiyKLHzN)).

In the next section, we delve deeper into three possible elements that games may include and the research that suggests how this may enable learning, behavior, and attitudinal change.

<HEAD2><LBL>**4.1**</LBL><TITLE>**Character-Level Game Mechanisms**</TITLE></HEAD2>

Within games there are many methods in which to more greatly engage the player in behavioral and attitudinal change. We focus on three: role-taking/playing, characters, and narrative/content. The relationship among these and theoretical models is discussed in the following.

<HEAD3><LBL>**4.1.1**</LBL><TITLE>**Role-Taking versus Role-Playing**</TITLE></HEAD3>

Many serious games allow a player to establish a relationship with a character in a variety of ways; one way is through role-playing or role-taking. Role-taking involves the adoption of a character’s point of view ([Peng et al., 2010](#LinkManagerBM_REF_Q59HAeMm)). Role-playing is different in that it is a cognitive process in which the individual’s identity and the character’s point of view are shared and meet role expectation ([Mead, 1934](#LinkManagerBM_REF_oCom9yoA)). For example, a woman can play the role of a mother by taking care of children. Whereas, on the other hand, role-taking requires an individual to suspend, temporarily, their own positionality, role-playing is the act of engaging in a role that is part of the individual’s identity ([Coutu, 1951](#LinkManagerBM_REF_4L8euamB)). Research suggests that individuals engage in role-playing continuously, and that changes in roles are dependent on salience of identity when in a particular context ([Wendorf Muhamad, 2016](#LinkManagerBM_REF_tMqErVhe)). Referencing once again the example of the woman, she can be playing the role of the mother while with her children but when at work she role-plays that of an employee. Role-taking, on the other hand, is not about bringing out parts of a previously held identity or schema, but about rehearsing the attitudes, behaviors, beliefs, and values of the *other* from the other’s standpoint ([Coutu, 1951](#LinkManagerBM_REF_4L8euamB); [Kelley et al., 1975](#LinkManagerBM_REF_UoxCqDsr)). Role-playing can thus be said to be lived and enacted experience, not a vicarious one. In role-taking games players must adjust their schemas and expectations of the assigned or selected role to meet game goals (i.e., winning). During role-taking experiences individuals actively suspend held ideologies, allowing for the elicitation of novel attitudes or behaviors ([Wendorf Muhamad, 2016](#LinkManagerBM_REF_tMqErVhe)). Players who are role-taking in role-playing games (RPGs) may also seek to perform tasks, meet goals, and make choices that relate to the role they are inhabiting, such as historical, ethics-related, or empathy-related behaviors and activities ([Schrier, 2017b](#LinkManagerBM_REF_BkhdhvWN); Schrier, 2006). Schrier found that players felt immersed in the role of their main character (or avatar) in games such as *Fable III* or *Way*, but they often empathized with other players, whether real or virtual (non-player characters), particularly when they were collaborating with them or solving problems and meeting goals with them ([Schrier, 2017b](#LinkManagerBM_REF_BkhdhvWN); Schrier & Shaenfield, 2017).

<HEAD3><LBL>**4.1.2**</LBL><TITLE>**Character Identification**</TITLE></HEAD3>

Identification, more precisely character identification, involves temporarily sharing the position of a character so that a greater level of understanding of the character’s experience is possible ([Flavell, Botkin, Fry, Wright, & Javis,](#LinkManagerBM_REF_lMOgSF4j) [1968](#LinkManagerBM_REF_lMOgSF4j)). Identification can be described as an immersive experience in the character’s environment, and through this process connecting with the character in cognitive and emotional ways. Identification is not imitation; rather, identification carries a level of emotive response possible only through deep engagement ([Tal-Or & Cohen, 2010](#LinkManagerBM_REF_mMKAYKnE)). Key to identification are four dimensions: (1) shared feelings (empathy); (2) shared cognitions; (3) shared goals (which lead to motivation to engage as a character); and (4) deep and complete transportation into the story (absorption) ([Cohen, 2001](#LinkManagerBM_REF_rpRvl2a4)). Identification allows for a more intimate and personalized relationship with the character in which an individual’s attitudes and behaviors are that of the character (the assigned/selected role) and not necessarily how the individual would act in real life. This process of detaching—suspending held schemas—from the self allows for a richer understanding of the character ([Wendorf Muhamad, 2016](#LinkManagerBM_REF_tMqErVhe); 2019). Embodied understanding of the other is fundamental to the reduction of psychological reactance. It is important to note a distinction between identification and homophily. Homophily, or perceived similarity, refers to an individual’s perception of shared cognition, emotions, and desired outcomes (game goals) with game character. Moreover, an individual perceives they might hold shared history (historical context) with the character. This is different than identification because the individual is engaging in forming *bridges of understanding* with the character (shared likes/dislikes) but not an assumed shared experience (I am like this character). Thus, players of games may be able to perform and express alternate identities, in addition to expressing their own identities, without fear of consequences. Research has suggested that players may identify more with their avatar, but empathize more with other characters, because a little distance is necessary for feeling what others are feeling ([Darvasi, 2016](#LinkManagerBM_REF_KlV3xDw2); [Farber & Schrier, 2017](#LinkManagerBM_REF_Vt1wClG6)).

<HEAD2><LBL>**4.2**</LBL><TITLE>**Narrative-Level Game Mechanisms**</TITLE></HEAD2>

Beyond character-level mechanisms, efficacious experiential environments, such as games, also employ narrative-level mechanisms. Of these, transportation appears to be a significant predictor of engagement. Defined as an individual’s state of total absorption in the narrative content ([Green & Brock, 2000](#LinkManagerBM_REF_5RiNimuh)), transportation entails living the experience versus understanding or processing the story ([Gerring, 1993](#LinkManagerBM_REF_ek4alSaN)). [Gilbert (1991)](#LinkManagerBM_REF_YbKhobhk) considers transportation to be a space of “suspended disbelief” as the individual is not concerned with the facts of the story but with experiencing the story. According to [Moyer-Gusé (](#LinkManagerBM_REF_TjkdW4EL)[2008)](#LinkManagerBM_REF_TjkdW4EL), individuals that are transported, or absorbed in the narrative storyline, cannot formulate counter-arguments, a form of reactance. When transportation is present the elaborative efforts are not focused on countering the message, which enhances the possibility of character-level mechanisms (e.g., identification) emerging. Being more fully immersed in a story world may relate to greater practice of empathy for the characters and perspectives of that story ([Farber & Schrier, 2017](#LinkManagerBM_REF_Vt1wClG6)).

Interactivity, a feature often referenced in digital games, also plays a significant role in the game experience. According to the literature interactivity appears to be a multidimensional construct ([Ha & James, 1998](#LinkManagerBM_REF_WbxuEKKs); [Heeter, 1989](#LinkManagerBM_REF_9jicPZ2P); [Klimmt et al., 2007](#LinkManagerBM_REF_HEB1tXa3); [Weber et al., 2014](#LinkManagerBM_REF_qZOkIT3D)). Generally speaking, interactivity can be defined as an objective feature of a message, communication channel, and/or media platform (e.g., [Carey, 1989](#LinkManagerBM_REF_EBYNvt7I); [Coyle & Thorson, 2001](#LinkManagerBM_REF_ZEuXzcwY); [Liu & Shrum, 2009](#LinkManagerBM_REF_6huLBm74); [Sundar, 2007](#LinkManagerBM_REF_VQEQwZvw)) or as an individual’s subjective experience (e.g., [Bucy & Tao, 2007](#LinkManagerBM_REF_8lRpEHi4); [Leiner & Quiring, 2008](#LinkManagerBM_REF_1BwM1dyX); [McMillan & Hwang, 2002](#LinkManagerBM_REF_YWqTjS2N); [Sohn & Lee, 2005](#LinkManagerBM_REF_3dELXjjj)). As an objective feature of a medium, interactivity is thought to be more inclusive of interactive features (i.e., hyperlinks) than traditional forms of communication (i.e., print media). This operationalization of interactivity focuses primarily on interactive features as a functional aspect of a particular medium (Heeter, 2000). Laurel (1990) described interactivity as a mega-construct consisting of three key dimensions: frequency, range, and significance. Scholars (e.g., [Sundar et al., 2003](#LinkManagerBM_REF_NfzYHPAH)) have expanded on these ideas and focused on characteristics such as responsiveness of a medium, while others have concentrated on the presence or absence of technological features (i.e., links, zoom) as a measure of a medium’s interactivity ([Song & Zinkhan, 2008](#LinkManagerBM_REF_4LXNAuHY); [Trammell et al., 2006](#LinkManagerBM_REF_5zYZzECy)). As a subjective experience, perceived interactivity is reliant on the individual’s ability to identify and employ interactive features of a medium ([Bucy & Tao, 2007](#LinkManagerBM_REF_8lRpEHi4); [Sundar, 2004](#LinkManagerBM_REF_pT7n6dZa)). Among digital serious games, interactivity has been linked to the process of action/inaction by a player and the consequences/feedback received as a result ([Ritterfeld, Shen, Wang, Nocera, & Wong,](#LinkManagerBM_REF_rvwAgp8T) [2009](#LinkManagerBM_REF_rvwAgp8T)). Other studies have focused on a player’s autonomy within the game to measure interactivity. This includes the ability to select an avatar (customization and personalization), sound control, and controls over other visual components (e.g., [Qin, Patrick Rau, & Salvendy, 2009](#LinkManagerBM_REF_ZKToCnER); [Weber et al., 2014](#LinkManagerBM_REF_qZOkIT3D)). Interactivity can also include being able to move a character or more advanced features such as building on storyline (narrative content) through a series of in-game choices (Fuchsocher, Niesenhaus, & Krämer, 2011; [Weber et al., 2014](#LinkManagerBM_REF_qZOkIT3D)).

<HEAD1><LBL>**5.**</LBL><TITLE>**Designing Serious Games**</TITLE></HEAD1>

Studies have found that games guided by theoretical frameworks are more efficacious intervention tools ([Baranowski 2016](#LinkManagerBM_REF_6sfMjgQf); Baranowksi et al., [2008](#LinkManagerBM_REF_BZdhXTat); [Bul et al., 2015](#LinkManagerBM_REF_YlaxzRzb)); however, it is important to understand that the purpose of games is not to do all the communicative work of the intervention. Well-built games centered around a specific topic (e.g., health) have clearly outlined desired outcomes (change in attitudes and/or behaviors), and consider the needs of the population ([Glanz et al., 2008](#LinkManagerBM_REF_ccfuEf5z)), as well as the context of its use, among other factors ([Schrier, 2018](#LinkManagerBM_REF_7qGTEamU)). It is during the initial planning phase of a game that theory should be incorporated as it helps define the process necessary to achieve persuasive outcomes. Incorporating theory as a basis of game design carries certain advantages. *Plan-It Commander*, a serious game intended to educate and promote organizational (time management, planning, and sequencing) and prosocial skills to children ages 8 to 12 diagnosed with ADHD, was based on theories of psychological and social development, including SCT ([Bandura, 1986](#LinkManagerBM_REF_oqr81ltr), [2001](#LinkManagerBM_REF_ZGGcsdM8), [2004](#LinkManagerBM_REF_ynBI1bHR)). As mentioned above SCT theorizes that human behavior is the product of personal (attitudes and behaviors) and environmental (social norms) dynamic forces ([Bandura, 2001](#LinkManagerBM_REF_ZGGcsdM8)). Additionally, it is through the observing of these forces in others that individuals change ([Bandura, 2001](#LinkManagerBM_REF_ZGGcsdM8), [2004](#LinkManagerBM_REF_ynBI1bHR)). Taking these guiding principles into account, *Plan-It Commander* incorporates purposeful design choices (e.g., a virtual mentor to provide feedback to enable mastery of desired outcomes, modeling of social interactions) ([Bul et al., 2015](#LinkManagerBM_REF_YlaxzRzb)). Similarly, *RightWay Café*, a game designed to promote health dietary choices, includes a prosocial message based on two prominent health theories: the health belief model ([Rosenstock, 1974](#LinkManagerBM_REF_jJCpIbid); [Rosenstock et al., 1988](#LinkManagerBM_REF_eOgSlWLk)) and the theory of reasoned action (Ajzen & Fishbein, 1980).

When incorporating theoretical principles, it is important to note the potential effects of certain choices on players. For example, while it may be interesting from a game design perspective to have assigned character avatars in a game, if the intention is to increase empathic response to a target population it may be more beneficial to have individuals create their own game avatar. The process of developing how they perceive the character (how they “see” the character) may enhance identification with the character, which in turn may have significant effects in overall transportation which has been found to offset reactance to message. This may be particularly helpful in scenarios in which individuals are asked to play highly stigmatized characters ([Wendorf Muhamad, 2016](#LinkManagerBM_REF_tMqErVhe)). For example, in the game *Por Nuestras Calles* (Wendorf Muhamad, Tran, Villar, 2014; [Wendorf Muhamad, 2016](#LinkManagerBM_REF_tMqErVhe)), given the highly taboo nature of the commercial sexual exploitation of children, sex work individuals were invited to create their characters as opposed to selecting a game piece. While individuals draw their characters the game facilitator begins to address them by the character’s name. This parallel process—drawing the character from the players held schema (how they envision the character) and being called the character’s name—induces identification.

<FIG><LBL>FIGURE 9.1</LBL><CAPTION>*Por Nuestras Calles* character pegs created by players</CAPTION></FIG>

<HEAD2><LBL>**5.1**</LBL><TITLE>**Participatory-Based Research Approaches to Serious Game Design**</TITLE></HEAD2>

Today, the additive effects of communication strategies and interventions conducted within a participatory approach have been well established. Community, traditionally defined as audiences, are no longer viewed as passive recipients (passive media effects) but instead as active and instrumental members throughout all stages, including formative research, development, implementation, and evaluation. Projects constructed *with* and not *aimed at* or on *behalf* of communities aim to view members as experts, whose knowledge is critical to the design process (Peterson, 2010; [Wendorf Muhamad, 2016](#LinkManagerBM_REF_tMqErVhe)). Although games are defined as imitative processes of borrowing mechanics from one game to another (Costikyan, 2015), game development for communicative processes, such as social change, must consider cultural specificities. Engaging in a participatory process ensures that interventions, particularly games, are culturally adept not only in terms of cultural and social norms, but also in how the community interacts with the media artefacts. Additionally, this process enhances the likelihood of adoption through securing buy-in early on and addressing and planning for potential barriers (i.e., technological adoption, literary rates). Lastly, rarely is an intervention without unintended consequences. Within games these can include narrative, character archetypes, and visual elements, as well as systemic biases, ethical issues, and exclusion ([Schrier, 2019](#LinkManagerBM_REF_2MGkfHey), [2015](#LinkManagerBM_REF_6calKjqr)). Given that efficacious interventions minimize resistance, inclusion of community members not only ensures individuals feel heard, it also serves to counteract potential points of reactance that may not be obvious to an outsider.

Various studies (e.g., [Choi & Pak, 2006](#LinkManagerBM_REF_dug7NWKV); [Stokols et al., 2008](#LinkManagerBM_REF_3LtDr4j3)) have examined efficacy across transdisciplinary teams. Specifically, studies have focused on how teams organize around tasks and goals. Others have focused on the processes of coming together and the implications that differences across disciplines may have on team efficacy and game development ([Wendorf Muhamad & Harrison, 2018](#LinkManagerBM_REF_5eH8disn); [Wendorf Muhamad & Kim, 2019](#LinkManagerBM_REF_z59Q8WJS)). Diverse teams are more than a growing trend, in fact findings by [Khaled and Ingram (2012)](#LinkManagerBM_REF_vcAiRTQh) suggest that game design is improved through transdisciplinary frameworks, as this multiplicity of voices allows for a more robust description and representation of the complexity of the social issues that serious games tackle ([Schrier, 2016](#LinkManagerBM_REF_jfnU3XDc)). Practices such as ethnographic journaling, collective observation and documentation, continuous community check-in (and members checks), and others have been found to foster collaborative team environments ([Wendorf Muhamad & Harrison, 2018](#LinkManagerBM_REF_5eH8disn)). Participating in game design on collaborative, diverse teams may even individually foster greater understanding of one’s own and other’s identities ([Schrier, 2019](#LinkManagerBM_REF_2MGkfHey)). From the development of a serious game aimed at preventing commercial sexual exploitation of children, *Por Nuestras Calles*, [Wendorf Muhamad and Harrison (2018)](#LinkManagerBM_REF_5eH8disn) found four major emergent themes in participatory game design processes: (1) equipoise, (2) collaborative engagement, (3) shared efficacy, and (4) dialogic spaces. *Equipoise* is directly related to the tension and resolution cycles present in the interpersonal relationships of team members. “Team members” is an inclusive term that encompasses not only researchers and game designers but also community members as well as community-based organizations. Here, the tension is equally as important as the resolution or flow phases because although frequently framed negatively, conflict holds the potential to be constructive in encouraging interdependence and collective understandings ([Wendorf Muhamad & Harrison, 2018](#LinkManagerBM_REF_5eH8disn)). *Collective engagement* is exhibited as a reaction to the deliberative cycles of equipoise and as a result of advancement in communicative (team) efforts or project goals. *Shared efficacy* is the belief in the capacity of the whole—the team—to complete desired outcomes (i.e., game development; accurately representing community needs). Lastly, *dialogic spaces* consist of transformative dialogue that affirms collective goals and assists in processing uncertainty and apprehension. These are intentional spaces, purposefully built into the research and game design strategies.

Finding collaborative ways in which to develop games has emerged as an effective practice among many researchers as it allows teams to identify critical components of games and theory to develop an engaging experience that amplifies the potential positive effects of serious games ([Baranowski et al., 2008](#LinkManagerBM_REF_BZdhXTat), [2016](#LinkManagerBM_REF_6sfMjgQf); [Bul et al., 2015](#LinkManagerBM_REF_YlaxzRzb); Kato, 2012; [Noar, 2006](#LinkManagerBM_REF_4QGzZKNC); [Lwin et al., 2016](#LinkManagerBM_REF_XeDJvYE7)).

<HEAD1><LBL>**6.**</LBL><TITLE>**Conclusion**</TITLE></HEAD1>

There is growing evidence of the effectiveness of serious games as instruments for prosocial attitudinal and behavioral change, though, as with any intervention, there are limitations ([Farber & Schrier, 2017](#LinkManagerBM_REF_Vt1wClG6); [Schrier & Farber, 2018](#LinkManagerBM_REF_25OEukdZ)). Games make the familiar unfamiliar, but perhaps more importantly they foster environments in which ideologies can be detached from the self. In order for games to be effective, as previously mentioned, it is important to consider when and how to employ them as communicative strategies, as well as to acknowledge their potential limitation. Games are not meant to replace all persuasive media; however, they can enhance efforts when added to traditional channels of message delivery. The unintended consequences of the use of serious games, particularly those that address complex social issues, should be carefully considered as the inclusion or omission of information may inadvertently recreate oppressive systems, lack cultural competence, or create a boomerang effect on desire, attitude, and behavior change. Critical game design should not be limited only to narrative content, but should also account for visual elements, mechanics, and other mechanisms such as multiplayers versus single player.

Games—as facilitators of prosocial change—may allow for the development of purposeful communicative environments in which dialogue of complex social issues can emerge. Today, the persuasiveness of messages alone is not sufficient. Understanding how certain channels of communication may enhance desired change is essential. Well-designed serious games can allow for a nuanced understanding of phenomena, positioning individuals not in the *what do I think others feel/think* but in also presenting an opportunity to feel/think *as the other*.Although the abovementioned games are not a cure-all, they do allow for the disruption and reconstruction of sociopolitical environments, making systems of power and oppression visible. Furthermore, games serve to translate intricate information to and from audiences, allowing individuals to experience scenarios but also to act on them and to see the consequences of their action/inaction in real time.</BODY>

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