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Story Immersion of Videogames for Youth Health Promotion: A Review of Literature

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Abstract

This article reviews research in the fields of psychology, literature, communication, human–computer interaction, public health, and consumer behavior on narrative and its potential relationships with videogames and story immersion. It also reviews a narrative's role in complementing behavioral change theories and the potential of story immersion for health promotion through videogames. Videogames have potential for health promotion and may be especially promising when attempting to reach youth. An understudied characteristic of videogames is that many contain a narrative, or story. Story immersion (transportation) is a mechanism through which a narrative influences players' cognition, affect, and, potentially, health behavior. Immersion promotes the suspension of disbelief and the reduction of counterarguments, enables the story experience as a personal experience, and creates the player's deep affection for narrative protagonists. Story immersion complements behavioral change theories, including the Theory of Planned Behavior, Social Cognitive Theory, and Self-Determination Theory. Systematic investigations are needed to realize the powerful potential of interactive narratives within theory-driven research.

Introduction

Children and adolescents are active media users and early adopters of new types of entertainment. In the United States, children and adolescents spend more time with media than any other activity except sleep.[1] Among this population, time spent in daily videogame play has tripled in the past decade, with nearly 90% owning a videogame console.[1] Videogames provide an innovative venue for health promotion among large numbers of youth; results of studies suggest promising health effects.[2–7] Therefore, videogames are a promising method for reaching this population with health messages.

An understudied characteristic of videogames is their narrative, or story. Narrative is one of the most basic forms of human communication[8] and is universally enjoyed.[9] Narratives influence cognition, affect,[10,11] and potentially health behaviors[12] through *transportation*. Green and Brock[13] defined transportation as "a state in which a reader becomes absorbed in the narrative world" (p. 317) of novels (i.e., noninteractive media). Transportation is narrative's unique quality enabling the suspension of disbelief.[14] It also provides vivid personal experiences[15] and engenders a deep affection for its characters.[16] In the context of videogames, an interactive medium with immersive qualities highly appealing to children, *immersion* likely better describes the involving nature of game play. Transportation during videogame play will hereinafter be called "immersion" to avoid confusion.

Both videogames for health and narratives have demonstrated the capacity for implementing behavior change. The two have seldom been examined together as possible strategies for persuasive health communication among youth.[17] Immersion should enhance attention to a message and has thereby been proposed as the first step in behavior change induced by videogames.[17,18] This article reviews research in the fields of psychology, literature, communication, human–computer interaction, public health, and consumer behavior on the concept of narrative and its relation with videogames, the concept of story immersion and its roles in complementing behavioral change theories, and narrative's potential for health promotion through videogames.

Narrative Defined

Narratives originated from ancient oral cultures where people shared stories as life experiences. The Latin root for narrative is *narrare*, or "to recount."[19] In *Poetics*, Aristotle[20] defined narrative as a story that has a beginning, a middle, and an end. Narrative has been deemed next to language as a distinctive human characteristic. Narrative has been defined

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as a story people tell about themselves and others to establish a meaningful life-world,[21] "the central function or instance of the human mind"[22] (p. 13), "the quintessential form of customary knowledge"[23] (p. 19). Narrative "is present in every age, in every place, in every society"[24] (p. 251).

A simpler definition identified narrative as any two events arranged in a chronological or causal sequence.[25,26] A comprehensive definition includes "any cohesive and coherent story with an identifiable beginning, middle, and end that provides information about scene, characters, and conflict, raises unanswered questions or unresolved conflict; and provides resolution"[12] (p. 778).

Narrative and Videogames

Systematic academic exploration of the role of narrative in videogames has been limited for several reasons. First, traditional game study scholars do not agree about the role of narrative in videogames. Some argue narrative and videogames do not go together because it is impossible to develop a complete interactive narrative,[27,28] whereas others argue interactive narratives will be possible with further technological development and that narrative games will eventually become mainstream videogames.[29,30] Second, the majority of existing academic studies[31–33] have focused on negative effects, such as violence and aggression, rather than the positive potential of videogames. Third, the development of theoretical models explaining the effect of narrative on players is still underway. For example, the Transportation-Imagery Model,[34] which proposes the level of narrative persuasion depends on the degree to which people actively construct a mental image in response to story texts, is the only model currently available to explain textual narratives' persuasive effects. Furthermore, almost all existing empirical studies of media narratives have not measured behavioral effects.[35–37] As a result, narratives have been treated as a formalistic videogame feature,[38] rather than an independent variable.

Recent technological advancement has made it possible to integrate narrative into the gaming process and has given players sufficient control over story development. For example, "Heavy Rain" (2010) by Sony Computer Entertainment (Foster City, CA) is an interactive drama that allows players to decide story progression with multiple plots and endings. The popularity of videogames among children[1] has made it possible for extended engagement with interactive narratives. Narratives could be integrated with interactive videogames.[39] Children and adolescents are a highly imaginative group,[40] which may make them more receptive than adults to videogame narratives with fictional elements. Therefore, videogames with involving narratives could provide an innovative medium for children and adolescents that is easy to process, engaging to follow, and fun to experience.[41] For example, "Escape from Diab," a health game recently developed by Archimage (Houston, TX) in collaboration with Baylor College of Medicine for childhood obesity prevention, tells the story about Deejay, an athletic boy who accidentally falls into Diab, a nightmarish world where he and his newly found friends must escape by adopting a healthier lifestyle. The narrative was created by professional writers after extensive formative research with children of different ethnic groups.[42] The game has nine sessions. After the opening session, each subsequent session started with the resolution of the cliffhanger scene at the end of the previous session. A session-by-session description of the game can be found in Baranowski et al.[6]

Immersion (Narrative Transportation)

Two ways of knowing have been proposed: The paradigmatic and the narrative.[43] The paradigmatic way tends to logically verify and test for empirical truth. The narrative way is more subjective, stressing the importance of the quality of the experience. A crucial difference between narratives and non-narratives is a narrative's unique ability to "transport" people to another world and change their attitude through the journey-like experience. Immersion is a phenomenological experience of people's engagement with narratives, a process in which people "travel" into the story world and are changed by the journey.[44] Changes are typically knowledge-based, attitudinal, and sometimes even behavioral.[45,46]

Systematic empirical exploration of immersion began during the past decade and has been explored by disparate disciplines, such as psychology,[13] marketing,[11] communication,[47] human–computer interaction,[48] public health,[12] and mathematics education.[49] Green and Brock[13] conceptualized immersion as a highly involving and integrative process whereby cognitive and affective resources are concentrated. By creating highly involving, image-rich textual narratives, Green and Brock[13] developed and validated a psychometric scale for immersion and showed that immersion is the mechanism whereby textual narratives induce story-consistent beliefs and persuade people via mediation analysis. The level of the audience's immersion into media has been positively related to the outcome of the persuasion.[13] Immersion has worked in multiple modalities, including videotaped personal interviews and entertainment TV dramas as an alternative medium for persuasion.[36,47]

There are at least three ways through which narrative influences people.[50] First, immersion helps with the suspension of disbelief and reduction of counterarguments. This may be due to limited mental resources (when a person, consciously or unconsciously, suppresses doubt about a story element, his or her cognitive capacity may be fully committed to imagining events and thus no longer have sufficient mental resources with which to counterargue) and/or lack of motivation. A hallmark of narrative enjoyment is that audience members have a "willing suspension of disbelief,"[51] which may also withhold counterarguments because they do not wish to destroy the pleasure of the narrative immersion.

Green and Brock[13] demonstrated the willing suspension of disbelief using Pinocchio Circling. They asked respondents to reread a textual narrative and circle any passage they believed to be false. Highly immersed readers circled significantly fewer "false" passages and showed greater acceptance of story content.[13] Instead of constantly verifying the truth or falsity of the information in a narrative, immersed readers tended to suspend such thoughts in order to enjoy the story.

A second explanation for immersion's influence is that narrative experience can become a personal experience. Direct experience with attitude objects results in stronger and more enduring attitudes.[52] Thus, when people feel they have experienced events depicted in a narrative, their attitudes change in accordance with the narrative.[10] A well-crafted health narrative may create a sense of direct experience that

may later be incorporated into audience members' memory as if they had actually performed the health behavior.[53] Source monitoring studies have also indicated imagined events can be misremembered as real events to the extent that the memories had qualities similar to real memories.[54] For example, President Ronald Reagan recounted a heroic gunner's deed during World War II as an actual event. The story he told, however, was later revealed as coming from a popular wartime fictional film, "A Wing and A Prayer" (1944).[55] When a first-person narrative offers vivid details intertwined with some intriguing plot, an immersed individual may even misremember, as President Reagan did, the narrative is experienced as real.

Character and plot are the main components of a narrative and are important determinants of its immersive quality.[56] A character is a crucial structural property,[57] providing the driving force of a narrative[58] and serving as an "internal" source of information or beliefs.[14] The plot, or the "narrative discourse," is how story is conveyed. Plot also plays a pivotal role in story delivery by organizing events into a logically unfolding series of events[59] or in a temporal order.[26]

The third means of immersion's influence is through the creation of deep affection for a narrative's protagonists. Reader–character interaction may make a story more personally relevant to readers. For example, if a person strongly identifies with a character, statements or deeds of the character may have special influence as the reader may want to adopt the character's attitude or imitate the character's behaviors. People could be immersed even when the portrayal of the character was not entirely positive.[60]

Narrative and Behavior Change Theories

A well-crafted narrative embedded in a health videogame may be especially suitable for health behavior change. The narrative can complement several of the best known and widely used behavioral change theories, such as the Theory of Planned Behavior, Social Cognitive Theory, and Self-Determination Theory.

The Theory of Planned Behavior[61,62] specifies psychological variables influencing behavior. This theory posits a person's behavior is a function of the intention to perform that behavior, which in turn is a function of the attitude toward performing the behavior, subjective norms, and perceived behavioral control.[63–66] Attitude toward performing the behavior refers to the positive or negative value an individual associates with performing the behavior[61]; subjective norm refers to the perceived pressure from other people to perform (or not to perform) the behavior; and perceived behavioral control refers to people's perception of their ability to perform a given behavior.

Narrative may induce a more positive attitude toward performing healthy behaviors because of the immersion process. Non-narrative persuasive messages usually present propositions or facts that do not create alternative worlds for individuals to enter. When a health narrative offers or evokes vivid mental imagery, it may move people into the narrative world by inviting them to act as protagonists through a sense of direct experience and by allowing them to mentally rehearse the health benefits related to that behavior. For example, a narrative videogame featuring an attractive character with a plot and a beginning, middle, and end should allow players to experience a character's happiness with journey towards adoption of a healthy behavior more directly and vividly than didactic instruction alone. This is consistent with evidence that learning based on firsthand experience is more powerful than that based on information alone.[15,52] A well-constructed narrative, especially first-person ones,[12] therefore, should leave players with a more positive attitude toward performing the behavior featured in the game. Besides, with the recent research in implicit cognition offering some promise to overcome the limitation of explicit behavioral predictors,[67] narratives may induce health behavior change also through implicit cognition, but there is no literature addressing this within the context of health games.

Subjective norm refers to the perceived pressure from others to engage (or not to engage) in a behavior.[61] Ajzen[61] considered subjective norm a function of the total number of accessible beliefs concerning the expectation from other social referents. Subjective norm includes two types of norms: Injunctive and descriptive. Injunctive norms are an individual's perceptions about how other people think they should behave; descriptive norms are an individual's perceptions of what other people actually do. The other people can be friends, family members, significant others, social referents, or even mediated characters who are similar to the individual. The behaviors of those social references conveyed through immersive videogame narratives should help to influence the players' subjective norms.

Social Cognitive Theory describes a system of triadic determinism of behavior that is governed by personal, environmental, and behavioral factors.[68] Observational learning, or vicarious acquisition of knowledge from the social environment, serves as a primary source of information that promotes both cognitive and behavioral development. By observing other people's behavior, people may vicariously experience the full spectrum of challenges and expectations of a certain behavior and, in the process, acquire the knowledge and skills needed to successfully perform the behavior. A health videogame has potential through character actions to convey observational learning, model effective style, convey useful strategies, and demonstrate how to use these strategies. The game can also offer opposite vicarious experiences to the players as a consequence of undesirable versus desirable behaviors.

Self-efficacy, a key construct of Social Cognitive Theory, refers to the belief in one's capability to achieve different levels of performance.[68] It mediates the application of knowledge and skills in behavioral change.[69] Narrative may be especially useful in enhancing self-efficacy through two of its determinants[68,70]: Vicarious experiences and emotional arousal. Immersion enables people to cognitively rehearse the process and enjoy the benefit of seeing someone else adopting a healthy behavior.[71] Cognitive rehearsal may help people organize, remember, and engender a greater sense of confidence that the behavior can be reproduced when necessary. Although non-narratives can also encourage people to be confident in their ability to perform a behavior directly, people may not be engaged in behavioral rehearsal, or not to the same extent as when they are immersed in narratives. Narratives also can provide positive emotional arousal. People usually make inferences about their capacities from physiological cues such as emotional arousal. Arousal interpreted as positive should increase efficacy beliefs. A well-constructed and involving narrative should be able to

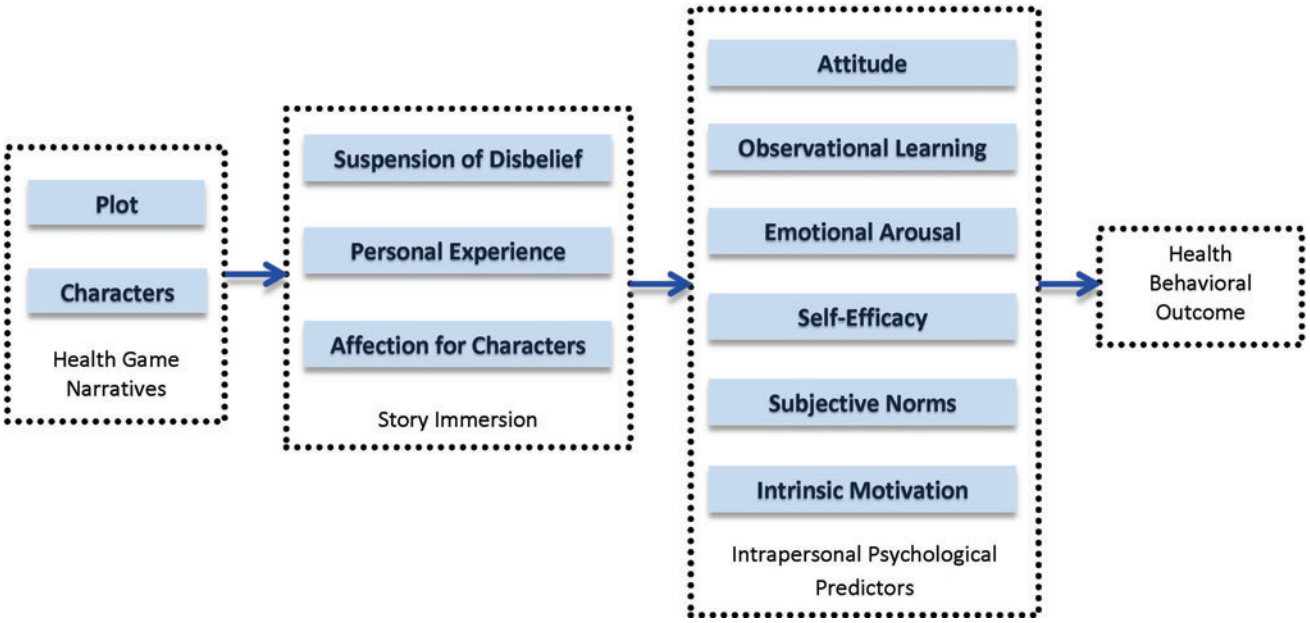

FIG. 1. A hypothetical model for the mechanisms of story immersion of health games. Color images available online at www.liebertonline.com/g4h

engender positive and powerful arousal in people because immersion can be considered a particularly dramatic example of arousal and attention.[72]

According to the Self-Determination Theory,[73] human behavior is driven by individual (intrinsic) and external (extrinsic) motivation factors.[74] Intrinsic motivation predicts the initial and continued performance of a behavior.[75] Extrinsic motivation relies on external rewards and punishments, whereas intrinsic motivation is driven by characteristics such as novelty, challenge, and aesthetic value.[73,76] Entertainment, such as immersive health videogames, has been conceptualized as an intrinsically rewarding activity sought by people independent of extrinsic rewards.[77] Narratives provide intriguing incentives for players who, in the role of characters,[78] feel obliged to finish the story. Embedding narratives with immersive qualities into behavioral change games could promote the development of intrinsic motivation to complete the game and even to adopt the behavior promoted in the game.[79] For example, players could act as detectives solving mysteries by collecting evidence in different stages of the narrative development.

Conclusion

Technological advancements have revolutionized videogames and enabled them to be well integrated with immersive stories. Developed under the guidance of relevant psychological and behavioral theories, such as the Theories of Planned Behavior, Social Cognitive, and Self-Determination, the medium provides great promise to engender healthy changes within the young players. Engaging videogame narratives help players suspend disbelief and reduce counterarguments, enable the story experience as a personal experience, and create players' affection for characters. A hypothetical model has been created (Fig. 1) to illustrate the perspectives and speculations discussed in the previous sections. Systematic empirical investigations in enhancing the mechanisms of story immersion should help deconstruct as well as realize the powerful potential of interactive narratives with theory-driven research.

Author Disclosure Statement

No financial interests were reported from the authors except R.B., who is president of Archimage, Inc., and could make a profit from its games.

References

1. Kaiser Family Foundation. *Generation M2: Media in the Lives of 8- to 18-Year-Olds*. Menlo Park, CA: Kaiser Family Foundation; 2010.
2. Biddiss E, Irwin J. Active video games to promote physical activity in children and youth: A systematic review. Arch Pediatr Adolesc Med 2010; 164:664–672.
3. Foley L, Maddison R. Use of active video games to increase physical activity in children: A (virtual) reality? Pediatr Exerc Sci 2010; 22:7–20.
4. Bailey BW, McInnis K. Energy cost of exergaming: A comparison of the energy cost of 6 forms of exergaming. Arch Pediatr Adolesc Med 2011; 165:597–602.
5. Baranowski T, Baranowski J, Cullen KW, et al. Squire's Quest!: Dietary outcome evaluation of a multimedia game. Am J Prev Med 2003; 24:52–61.
6. Baranowski T, Baranowski J, Thompson D, et al. Video game play, child diet, and physical activity behavior change: A randomized clinical trial. Am J Prev Med 2011; 40:33–38.
7. Lu AS, Baranowski J, Cullen KW, et al. Interactive media for childhood obesity prevention. Health Commun 2010; 25: 581–582.
8. Fisher WR. The narrative paradigm: In the beginning. J Commun 1985; 35:74–89.
9. Cosmides L, Tooby J. Consider the source: The evolution of adaptations for decoupling metarepresentation. In: Sperber D, ed. *Metarepresentations: A Multidisciplinary Perspective*. New York: Oxford University Press; 2000: 53–115.

10. Slater MD, Rouner D. Entertainment-education and elaboration likelihood: Understanding the processing of narrative persuasion. Commun Theory 2002; 12:173–191.
11. Escalas JE. Imagine yourself in the product: Mental simulation, narrative transportation, and persuasion. J Advertising 2004; 33:37–48.
12. Hinyard LJ, Kreuter MW. Using narrative communication as a tool for health behavior change: A conceptual, theoretical, and empirical overview. Health Educ Behav 2007; 34:777–792.
13. Green MC, Brock TC. The role of transportation in the persuasiveness of public narratives. J Personality Soc Psychol 2000; 79:701–721.
14. Drewnowski A. Taste preference and food intake. Annu Rev Nutr 1997; 17:237–253.
15. Epstein S. Cognitive-experiential self-theory. In: Barone DF, Hersen M, Van Hasselt VB, eds. *Advanced Personality*. New York: Plenum Press; 1998: 211–238.
16. Oatley K. Emotions and the story worlds of fiction. In: Green MC, Strange JJ, Brock TC, eds. *Narrative Impact: Social and Cognitive Foundations.* Mahwah, NJ: Lawrence Erlbaum; 2002: 39–69.
17. Lu AS, Thompson D, Baranowski J, et al. Story immersion in a health videogame for childhood obesity prevention. Games Health J 2012; 1:37–44.
18. Baranowski T, Baranowski J, Thompson D, Buday R. Behavioral science in video games for children's diet and physical activity change: Key research needs. J Diabetes Sci Technol 2011; 5:229–233.
19. narrate, v. *Oxford English Dictionary*. New York: Oxford University Press; 2008.
20. Aristotle. *Poetics.* London: Penguin Books; 1996.
21. Fisher WR. Narration as a human communication paradigm: The case of public moral argument. Commun Monogr 1984; 51:1–22.
22. Jameson F. *The Political Unconscious: Narrative as a Socially Symbolic Act*. Ithaca, NY: Cornell University Press; 1981.
23. Lyotard J-F. *The Postmodern Condition: A Report on Knowledge*. Minneapolis: University of Minnesota Press; 1984.
24. Barthes R. Introduction to the structural analysis of narratives. In: Sontag S, ed. *A Barthes Reader*. New York: Hill and Wang; 1985: 251–295.
25. Rimmon-Kenan S. *Narrative Fiction: Contemporary Poetics*, 2nd ed. London: Routledge; 2002.
26. Labov W. The transformation of experience in narrative syntax. In: Labov W, ed. *Language in the Inner City: Studies in Black English Vernacular*. Philadelphia: University of Pennsylvania Press; 1972: 354–396.
27. Eskelinen M. The gaming situation. Game Studies 2001; 1(1). www.gamestudies.org/0101/eskelinen/ (accessed January 14, 2009).
28. Juul J. Games telling stories? A brief note on games and narratives. Game Studies 2001; 1(1). www.gamestudies.org/0101/juul-gts/ (accessed January 14, 2009).
29. Plowman L. Narrative, linearity and interactivity: Making sense of interactive multimedia. Br J Educ Technol 1996; 27:92–105.
30. Wolf MJP. *The Medium of the Video Game*. Austin: University of Texas Press; 2001.
31. Bensley L, Van Eenwyk J. Video games and real-life aggression: Review of the literature. J Adolesc Health 2001; 29:244–257.
32. Gentile DA, Stone W. Violent videogame effects on children and adolescents. A review of the literature. Minerva Pediatr 2005; 57:337–358.
33. Anderson CA, Shibuya A, Ihori N, et al. Violent video game effects on aggression, empathy, and prosocial behavior in eastern and western countries: A meta-analytic review. Psychol Bull 2010; 136:151–173.
34. Green MC, Brock TC. *In the Mind's Eye: Transportation-Imagery Model of Narrative Persuasion*. Mahwah, NJ: Lawrence Erlbaum; 2002.
35. de Graaf A, Hoeken H, Sanders J, Beentjes JWJ. Identification as a mechanism of narrative persuasion. Commun Res 2011; DOI: 10.1177/0093650211408594.
36. Kreuter MW, Buskirk TD, Holmes K, et al. What makes cancer survivor stories work? An empirical study among African American women. J Cancer Surviv 2008; 2:33–44.
37. Moyer-Gusé E, Nabi RL. Explaining the effects of narrative in an entertainment television program: Overcoming resistance to persuasion. Hum Commun Res 2010; 36:26–52.
38. Schneider EF, Lang A, Shin M, Bradley SD. Death with a story: How story impacts emotional, motivational, and physiological responses to first-person shooter video games. Hum Commun Res 2004; 30:361–375.
39. Lee KM, Park N, Jin S-A. Narrative and interactivity in computer games. In: Vorderer P, Bryant J, eds. *Playing Computer Games: Motives, Responses, and Consequences.* Mahwah, NJ: Lawrence Erlbaum; 2006: 259–274.
40. Shapiro MA, Pena J, Hancock JT. Realism, imagination, and narrative video games. In: Vorderer P, Bryant J, eds. *Playing Computer Games: Motives, Responses, and Consequences*. Mahwah, NJ: Lawrence Erlbaum; 2006: 275–289.
41. Ritterfeld U, Weber R. Video games for entertainment and education. In: Vorderer P, Bryant J, eds. *Playing Video Games: Motives, Responses, and Consequences*. Mahwah, NJ: Lawrence Erlbaum; 2006: 399–413.
42. Thompson V, Thompson D, Baranowski T. Understanding serious videogame storyline and genre preferences related to game immersion among low-income ethnically diverse urban and rural adolescents. In: Evans CM, ed. *Internet Issues: Blogging, the Digital Divide and Digital Libraries.* New York: Nova Science Publishers; 2010: 177–188.
43. Bruner JS. *Actual Minds, Possible Worlds.* Cambridge, MA: Harvard University Press; 1986.
44. Gerrig RJ. *Experiencing Narrative Worlds: On the Psychological Activities of Reading*. New Haven, CT: Yale University Press; 1993.
45. Kaiser Family Foundation. Kaiser Daily HIV/AIDS Report: Survey Shows 'Grey's Anatomy' Viewers Gained HIV Knowledge. 2008. http://www.kaisernetwork.org/Daily_Reports/rep_index.cfm?DR_ID-54504 (accessed October 6, 2008).
46. Piotrow PT, Kincaid DL, Roimon JG, Rinehart W. *Health Communication: Lessons from Family Planning and Reproductive Health.* Westport, CT: Praeger; 1997.
47. Slater MD, Rouner D, Long M. Television dramas and support for controversial public policies: Effects and mechanisms. J Commun 2006; 56:235–252.
48. Mateas M, Sengers P. Narrative intelligence. In: Mateas M, Sengers P, eds. *Narrative Intelligence.* Amsterdam: John Benjamins Publishing; 2003: 1–26.
49. Thomas RSD. The comparison of mathematics with narrative. In: van Kerkhove B, van Bendegem JP, eds. *Perspectives on Mathematical Practices: Bringing Together Philosophy of Mathematics, Sociology of Mathematics, and Mathematics Education*. Dordrecht, The Netherlands: Springer; 2007: 43–59.
50. Green MC, Garst J, Brock TC. The power of fiction: Determinants and boundaries. In: Shrum LJ, ed. *The Psychology of Entertainment Media: Blurring the Lines Between Entertainment and Persuasion.* Mahwah, NJ: Lawrence Erlbaum; 2004: 161–176.

51. Coleridge ST. Biographia literaria. In: Perkins D, ed. *English Romantic Writers.* New York: Harcourt; 1967.
52. Fazio RH, Zanna MP. Direct experience and attitude-behavior consistency. In: Berkowitz L, ed. *Advances in Experimental Social Psychology.* New York: Academic Press; 1981: 161–202.
53. Loftus EF, Pickrell JE. The formation of false memories. Psychiatr Ann 1995; 25:720–725.
54. Johnson MK, Hashtroudi S, Lindsay DS. Source monitoring. Psychol Bull 1993; 114:3–28.
55. Cannon L. *President Reagan: The Role of a Lifetime.* New York: Public Affairs; 2000.
56. Green MC, Strange JJ, Brock TC, eds. *Narrative Impact: Social and Cognitive Foundations.* Mahwah, NJ: Lawrence Erlbaum; 2002.
57. Jacobs RN. The narrative integration of personal and collective identity in social movements. In: Green MC, Strange JJ, Brock TC, eds. *Narrative Impact: Social and Cognitive Foundations.* Mahwah, NJ: Lawrence Erlbaum; 2002: 205–228.
58. Surmelian L. *Techniques of Fiction Writing.* Garden City, NY: Anchor Books; 1969.
59. Brown RH. *Society as Text: Essays on Rhetoric, Reason, and Reality.* Chicago: University of Chicago Press; 1987.
60. Green MC. Transportation into narrative worlds: The role of prior knowledge and perceived realism. Discourse Processes 2004; 38:247–266.
61. Ajzen I. The theory of planned behavior. Organ Behav Hum Decision Processes 1991; 50:179–211.
62. Ajzen I, Driver BL. Prediction of leisure participation from behavioral, normative and control beliefs: An application of the theory of planned behavior. Leisure Stud 1991; 13:185–204.
63. Sutton S, McVey D, Glanz A. A comparative test of the Theory of Reasoned Action and the Theory of Planned Behavior in the prediction of condom use intentions in a national sample of English young people. Health Psychol 1999; 18:72–81.
64. Fishbein M, Middlestadt SE. Using the Theory of Reasoned Action as a framework for understanding and changing AIDS-related behaviors. In: Mays VM, Albee GW, Schneider SF, eds. *Primary Prevention of AIDS: Psychological Approaches.* London: Sage Publications; 1989: 91–110.
65. Bandura A, Adams NE. Analysis of self-efficacy theory of behavioral change. Cognitive Ther Res 1977; 1:287–310.
66. Bandura A. Perceived self-efficacy in the exercise of control over AIDS infection. Eval Program Planning 1990; 13: 9–17.
67. Gawronski B. Ten frequently asked questions about implicit measures and their frequently supposed, but not entirely correct answers. Can Psychol 2009; 50:141–150.
68. Bandura A. Self-efficacy: Toward a unifying theory of behavior change. Psychol Rev 1977; 84:191–215.
69. Maibach E, Cotton D. Moving people to behavior change: A staged social cognitive approach to message design. In: Maibach E, Parrott R, eds. *Designing Health Messages: Approaches from Communication Theory and Public Health Practice.* Thousand Oaks, CA: Sage Publications; 1995:41–64.
70. Bandura A. *Self-Efficacy: The Exercise of Control*. New York: W.H. Freeman; 1997.
71. Maibach E, Flora JA. Symbolic modeling and cognitive rehearsal. Commun Res 1993; 20:517–545.
72. Slater MD. Entertainment education and the persuasive impact of narratives. In: Green MC, Strange JJ, Brock TC, eds. *Narrative Impact: Social and Cognitive Foundations*. Mahwah, NJ: Lawrence Erlbaum; 2002: 157–182.
73. Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. Am Psychol 2000; 55:68–78.
74. Heider F. *The Psychology of Interpersonal Relations*. New York: Wiley; 1958.
75. Ryan RM, Rigby C, Przybylski A. The motivational pull of video games: A self-determination theory approach. Motivation Emotion 2006; 30:344–360.
76. Rigby CS, Deci EL, Patrick BC, Ryan RM. Beyond the intrinsic-extrinsic dichotomy: Self-determination in motivation and learning. Motivation Emotion 1992; 16:165–185.
77. Vorderer P, Klimmt C, Ritterfeld U. Enjoyment: At the heart of media entertainment. Commun Theory 2004; 14:388–408.
78. Bielenberg DR, Carpenter-Smith T. Efficacy of story in multimedia training. J Netw Comput Appl 1997; 20:151–159.
79. Pillay HK. An investigation of cognitive processes engaged in by recreational computer game players: Implications for skills of the future. J Res Technol Educ 2002; 34:336–350.

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