Study illustrates how game design can reduce stereotypes and social biases

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The potential negative impact of games receives a lot of media coverage, yet research conducted at Dartmouth just published by *Cyberpsychology: Journal of Psychosocial Research on Cyberspace,* illustrates how games can have a positive impact in our society. The researchers use a new approach in game design— 'embedded game design'— to demonstrate how games can change players' biases, reduce social stereotypes and prejudice, and engender a more complex view of diversity.

The work was conducted by Dartmouth's Tiltfactor Lab, an interdisciplinary innovation studio that designs and studies games for social impact, and was led by Geoff Kaufman, now an assistant professor at the Human-Computer Interaction

Institute at Carnegie Mellon University, who was a postdoctoral researcher in psychology at Tiltfactor at the time of the study; and Mary Flanagan, Sherman Fairchild Distinguished Professor in Digital Humanities and founding director of Tiltfactor.

Through embedded game design, which is a term the authors coined, an intended persuasive message is incorporated into the overall game's content, mechanics or context of play, rather than making the message overt to the players. For the study, two embedded design strategies were tested: 'intermixing,' which combines "on-topic" and off-topic" game content to make the themes less apparent; and 'obfuscating,' which uses game genres or framing devices to redirect players' focus from the true objectives of the game.

For the study, the researchers used two party card games created at Tiltfactor that were funded by a National Science Foundation grant to challenge gender stereotypes and implicit bias in STEM— Awkward Moment, which challenges players to react to funny, embarrassing and stressful situations; and Buffalo: The Name-dropping Game, which asks players to name real or fictional examples who fit the game's unexpected combinations of attributes. A unique feature of these games is that they do not mention their ability to change players' [biases]. In fact, study findings indicated that obscuring the true intent of the games best supported players' growth and enjoyment.

According to Kaufman, "Designers of social impact interventions, including games, must be mindful of people's natural psychological resistance to any activity they perceive is attempting to alter the way they think or feel about an issue. This may be particularly true in the design of persuasive games, which, to be effective, should ideally be intrinsically engaging and re-playable experiences that people will return to again and again."
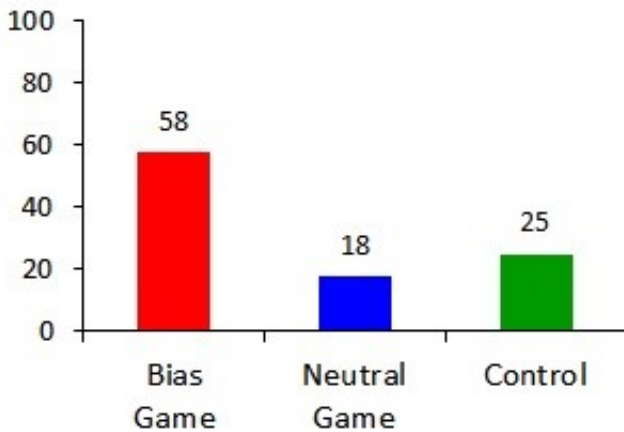
The percentage of participants in each condition who assigned 'scientist' to a female character. Credit: Figure 2 from *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, 9(3), article 1

Participants who played just one round of Awkward Moment matched a woman with the "scientist" job title 58 percent of the time, 33 percent more than a control group who did not play any game and 40 percent more than a group who played a neutral game that did not include cards referencing incidents of gender bias.

"Our work reveals that strategically embedding psychological techniques in a game's design both enhances the game's impact and provides a transformative player experience," says Flanagan.

Sample adjective cards and noun cards from Buffalo: The Name Dropping Game. Credit: Tiltfactor.
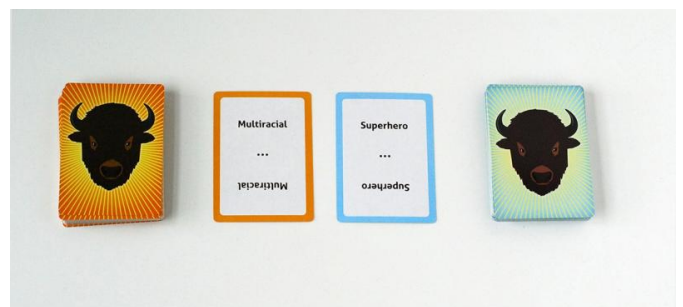
Awkward Moment was designed to reduce gender stereotypes and biases in STEM. Players submit a reaction card to a chosen 'awkward moment,' which may be a scenario like: "While shopping at the mall, you notice a store is selling t-shirts for girls that say, 'Math is hard.'" Each round, a decider chooses a winner from the submitted reactions.

Awkward Moment reflects the embedded design of 'intermixing'— cards that address situations involving bias against girls in STEM or a lack of gender equity, are interspersed with cards that do not address these situations. By using a pair of randomized studies with young game players, the researchers tested the effectiveness of the game's intermixing strategy in increasing a player's levels of perspective-taking and its impact on gender stereotyping and response to bias. Kaufman and Flanagan found that the game was successful at strengthening youth players' associations between women and science and inspiring more assertive responses to multiple forms of social bias.

To evaluate whether players' gender bias in STEM had changed after playing Awkward Moment, students were tasked with matching pictures of men and women with possible job roles.

Buffalo: The Name-dropping Game was also designed to reduce social stereotypes and biases by expanding players' mental representation of numerous social categories. Yet, the game's purpose is deliberately obfuscated from players, who are challenged to name a real person or fictional character who matches the adjective-noun pairing revealed as two cards are flipped over. Examples include: "multiracial + superhero" and "female + visionary."

The study examined how the game affected players' representations of social categories and prejudice, as well as their motivation to control their own biases. It revealed that Buffalo gameplay effectively promoted broader and more inclusive perceptions of social groups, even after playing the game just one time, and raised players' concerns about their own potential biases, as compared to baseline scores observed in a no-game comparison condition.

After playing Buffalo, students showed increased 'social identity complexity,' which is a measurement that predicts intergroup tolerance, as well as increased scores on a measure of 'universal orientation,' reflecting lower prejudice and a more complex view of the inclusivity and diversity of their world.

The studies with Awkward Moment and Buffalo demonstrate the ability of games to decrease [players](#)' social biases and promote more egalitarian, diversity-embracing mindsets, if the games are designed to do so. Both games are published by Mary Flanagan, LLC and are available for purchase online.

Provided by Dartmouth College

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