The Effects of Framing on Game Play Experience and Learning

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Abstract: Given the ubiquity of game play, scholars have become increasingly interested of the ways in which internal and external aspects of games may impact players. One external factor of importance is cognitive framing of games. The present study examined the effects of framing the board game *Blokus Duo* (Tavitian, 2005); participants were randomly assigned to one of three conditions in which the game was framed via game instructions as "spatial," "strategic," or was not framed. Results revealed that the spatial frame undermined women's performance and enhanced men's performance on a spatial reasoning test relative to the performance of participants to whom the game was not framed. Furthermore, the spatial frame negatively affected game satisfaction for participants relative to the effects of the strategic frame. General implications of these findings, particularly as they pertain to stereotype threat and the field of games for impact, are discussed.

Introduction

The ubiquity of game play (e.g., Common Sense Media, 2011) underscores the importance of studying the ways in which games impact players. Scholars have considered the influence of factors internal to games, such as content and structure (e.g.,Gee, 2003), as well as contextual factors, such as individual differences among players (e.g., Gobet, de Voogt, & Retschitzki, 2004), on game play outcomes. One contextual factor of gaming that remains to be studied is *cognitive framing* of games. Cognitive framing, according to Iyengar (1991, p. 11) involves "subtle alterations in the statement or presentation" of items.

The current study explored participants' spatial reasoning scores and game satisfaction after playing *Blokus Duo* (Tavitian, 2005); the game was framed as spatial, as strategic, or was not framed. The study tested the following hypotheses:

1. Framing the game as spatial will negatively impact women's spatial reasoning scores due to *stereotype threat*, which is an anxiety that arises when one performs a task "for which a negative stereotype about one's group applies" (Steele, 1997, p. 614).

2. All participants will derive less game satisfaction when the game is framed as spatial because the label may signal that the game is educational (and therefore not fun; e.g., Hinebaugh, 2009). For women, presence of stereotype threat will also lead to decreased game play satisfaction.

3. The strategic label will boost game satisfaction and spatial performance because 'strategy' implies that players have *agency* in a game; evidence suggests that perceived game agency is motivating (e.g., Ryan, Rigby, & Przybylski, 2006) and may lead to cognitive growth (e.g., Vogel et al., 2006).

Methods

Participants

105 undergraduates (49 males) participated in the study and were compensated for their time.

Materials

Participants played *Blokus Duo*. The object of the game is to place 21 pieces on the game board and to cover the most area while following rules regarding piece placement. The game ends when both players run out of moves.

Procedure

Participants completed the study in pairs. Upon arrival, each pair was randomly assigned to one of three conditions: spatial game, strategic game, or unframed game. The game was framed via the rules of game play read to participants by the experimenter; otherwise, the procedure for the three conditions was identical. Participants learned the rules and then played a game against one another.

After the game, participants completed the Mental Rotation Test (Vandenberg & Kuse, 1978), which asks participants to match a given figure with two out of four choices that represent valid rotations of the original figure. Afterwards, participants completed a questionnaire composed of Likert-style questions that assessed participants'

subjective game play experience. Five items related to game play satisfaction were anchored on a 1 to 7 scale; scores were combined to create a satisfaction index (α = .81). Then, participants were verbally debriefed. Each trial lasted for 40-60 minutes.

Results

Results were analyzed with 3 x 2 analyses of variance (ANOVAs). In regard to spatial performance, a main effect of gender emerged, $F(1, 98)$ = 9.70, p = .002, indicating that females (M = 10.71, SD = 4.39) performed worse than males (M = 13.33, SD = 4.40) across all conditions. The frame X gender interaction was also significant, $F(2, 98)$ = 4.60, p = .01 and was analyzed with pairwise comparisons. The gender gap in performance was only significant when the game was framed as spatial, $p < .001$. Females in the spatial condition (M = 9.11, SD = 4.38) performed worse than did females in the control condition (M = 12.35, SD = 4.34; p = .02), while males in the spatial condition (M = 14.94, SD = 4.04) performed better than did males in the control condition (M = 11.93, SD = 4.65; p = .05).

In regard to game play satisfaction scores, a main effect of framing condition approached significance, $F(2, 99)$ = 2.44, p = .09; t-tests revealed that participants in the spatial condition (M = 4.59, SD = 1.07) reported less game satisfaction than did participants in the strategic condition (M = 5.16, SD = 0.97; $t(68)$ = -2.30, p = .02).

Conclusions

The findings of the current study highlight the importance of considering game framing as one crucial contextual factor when studying game play outcomes. Internal aspects of games such as content and structure (e.g., Gee, 2003) receive attention from researchers. On the other hand, although some scholars have noted the importance of the game play context (e.g., Squire, 2012), empirical research to substantiate its relevance is, thus far, scarce but badly needed in the literature. Only by studying the effects of the game play context, including game framing, can scholars fully understand the ways in which games impact players.

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