

PeaceMaker: Changing Students' Attitudes Toward Palestinians and Israelis Through Video Game Play

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An experiment investigated the effects of video game role-play on change of students' explicit and implicit attitudes toward Palestinians and Israelis. Sixty-eight participants played *PeaceMaker*, a video game in which people play the role of the Palestinian president or the Israeli prime minister and respond to various scenarios through diplomatic, economic, and military decision-making. Results showed that participants, before playing *PeaceMaker*, expressed higher favorability toward Israelis than Palestinians. Participants who played the role of Palestinian president reported positive changes in explicit attitudes toward Palestinians and negative changes toward Israelis, while those who played the role of Israeli prime minister reported no meaningful attitude changes toward either national group after playing the game. Implicit attitudes were more positive toward Palestinians at the baseline, yet did not change significantly as a function of the treatment for both national groups. Results are discussed in relation to self-persuasion, persuasive games, and attitude change.

Over the past few decades, the Palestinian-Israeli conflict has vacillated between escalating violence and attempts at peaceful resolution (Baylis, Wirtz, Cohen, & Gray, 2007; Mansour, 2002; Moaz, Ward, Katz, & Ross, 2002). Amid these political changes, American foreign policy has been central to the peace process. Regarding the United States as a necessary mediator, both sides in the conflict have been relentless in trying to affect American public opinion in hopes of achieving changes in U.S. foreign policy (Carter, 2006; 2009; Christison, 1997; Gilboa, 1987; 2002; Gilboa & Inbar, 2009; Mearsheimer & Walt, 2007; Moughrabi, 1986; Quandt, 2005). While outsiders may seem ambivalent toward the groups involved in this conflict, American attitudes toward Israelis and Palestinians have fluctuated over the past few decades. Generally, however, public opinion trends suggest greater favorability and sympathy toward

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Israelis over Palestinians (Bard, 1994; Krosnick & Telhami, 1995; Mayer, 2004; Phillips, Lengyel, & Saxe, 2002; Suleiman, 1984).

Rather than analyze these trends, the current study explored how new media use may lead to changes in attitudes toward foreign nations. More specifically, this study investigated the effects of playing *PeaceMaker*, a video game simulation of the Palestinian-Israeli conflict, on the change of American college students' attitudes toward Palestinians and Israelis. By categorizing *PeaceMaker* as a persuasive game (Bogost, 2006, 2007; Smith & Just, 2009), the study explored the effects of role-play (Elms, 1966; Greenwald & Albert, 1968; Janis & King, 1954; Watts, 1967) on attitude change through the process of self-persuasion (Aronson, 1999; Maio & Thomas, 2007).

The paper starts with a review and conceptualization of persuasive video games and their effects on individuals, along with a description of *PeaceMaker*. The paper then reviews existing literature on attitudes, attitude change, role-playing and self-persuasion, and then provides a review of explicit and implicit attitude measures. The fourth and fifth sections, respectively, describe the conduct and results of an experiment in which participants were randomly assigned to play the role of the Israeli prime minister or Palestinian president, where their attitudes toward both sides were measured before and after playing the video game using explicit and implicit attitude tests. The final section discusses the theoretical and practical implications of the study's findings.

Defining Video Games

Currently more popular than Hollywood movies, video games have become influential tools of entertainment (Squire, 2003; Tawil-Souri, 2007). The video, computer, and online game industry is thought to be one of the last industries standing in the face of the recent recession in the United States and worldwide. Despite an 8% drop in sales from the previous year, U.S. video game sales totaled \$19.66 billion in 2009 (NDP Group, 2010a), while the use of and time spent playing video games increased by 10% in the first quarter of 2010 compared to 2009 (NDP Group, 2010b). An extreme majority of teenagers (97%), more than three-quarters of college students, and over half of adults reported playing video, computer, or online games (Lenhart, Jones, & Macgill, 2008; Pew, 2008).

When a medium becomes popular, researchers start investigating its effects. Roig and colleagues (Roig, Corneilo, Adevol, Alsin, & Pages, 2009) explain that the effects of video games can be understood through the overall framework of media practices. Along with bringing new forms of pleasure due to their distinct structural features and playability functions, Roig and colleagues argue that considering the cultural context in which video games evolve is essential to understanding their effects. The trend in studying video games' effects on individuals and society focuses on violent feelings and aggressive behavior (e.g., Anderson & Bushman, 2001; Anderson & Dill, 2000; Barlett, Rodeheffer, Baldassaro, Kinkin, & Harris, 2008; Eyal, Metzger, Lingweiler, Mahood, & Yao, 2006; Funk, Baldacci, Pasold, & Baumgardner, 2004; Smith, Lanchlan, & Tamborini, 2003; Peng, Klein, & Lee, 2006; Weber, Behr, Tamborini, Ritterfeld, & Mathiak, 2009; Williams, 2006). Conversely, the current study investigates positive rather than negative effects of video games. The focus here is on games that have been described as serious games (Michael & Chen, 2006; Wong et al., 2007), civic games (Kahn, Middaugh, & Evans,

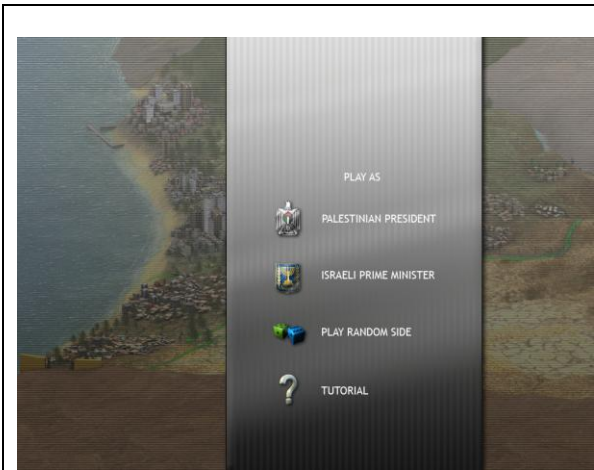
2008), and persuasive games (Bogost, 2006, 2007, 2008; O’Luanaigh, 2006; Smith & Just, 2009). While these terms are often used interchangeably throughout the literature, we will refer to them here as persuasive games, based on the assumption that their goal is to facilitate change in attitudes and/or behaviors.

Video Games: From Learning to Persuasion

In addition to their popularity, video games’ structural and content features may make the learning process more appealing and goal-oriented (Mitchell, 2004; Squire, 2003; Tawil-Souri, 2007; Wong et al., 2007). These qualities have also led to the use of video games for social and political reasons. The U.S. Army has been using video games to boost its recruitment numbers (Reiss, 2009), and advertisers and marketers have been integrating products and advertising messages in various gaming environments (Bailey, Wise & Bolls, 2009; Smith & Just, 2009; Wise, Bolls, Kim, Venkataraman, & Meyer, 2008). While this terminology puts vastly different games into one group, the commonality among these different types of video and computer games is their focus on persuading players.

Bogost (2006, 2007) explicates persuasive games through the lens of what he calls *procedural rhetoric*. The author argues that video games do not present direct persuasive messages to the players, but rather, provide players with an environment (a set of rules and procedures) where they become part of the persuasion process by developing the arguments in order to fulfill the game’s goal(s). Peng, Klein, and Lee (2006) found support for this in a study where those who played the role of a police officer in a video game were generally more flexible in evaluating crimes committed by police officers than those committed by generic criminals.

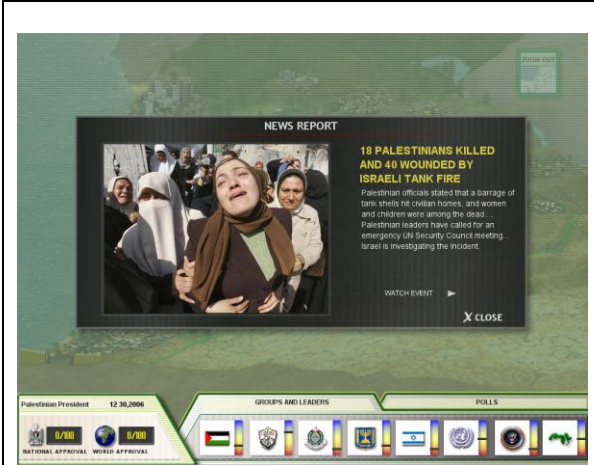
Smith and Just (2009) agree with Bogost’s claims that some sort of persuasion takes place when playing certain types of video games, yet call for a more analytical and rhetorical look at this medium. They argue that video games vary in the level of self-persuasion due to three factors: message autonomy, integration, and goal. Furthermore, the level of self-persuasion depends on the extent to which a video game contains these three factors. In the next section we describe *PeaceMaker*, the video game used in the current study, in terms of these three factors (see Figures 1A–E for screenshots as well as Illustration 1 for video trailer of *PeaceMaker*).



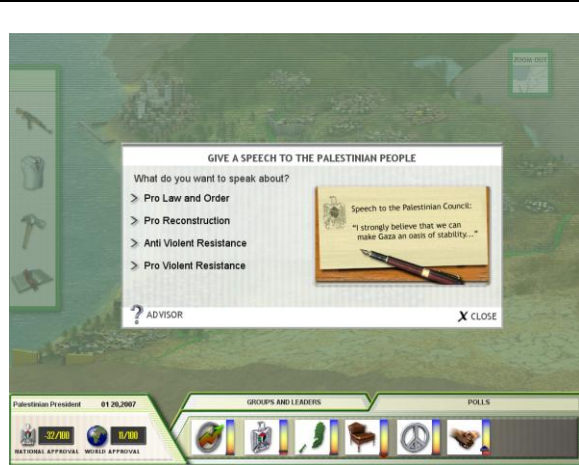
1A. Role Selection



1B. Decisions' Tab



1C. Event Description



1D. Decision Choice



1E. Timeline of Palestinian-Israeli Conflict

Figures 1A -1E. Screenshots of *PeaceMaker* (www.peacemakergame.com)



[Click on the movie clip above to view the trailer](#)

Illustration 1: Video Trailer of *PeaceMaker* (www.peacemakergame.com)

Autonomy. In *PeaceMaker*, players choose the nationality they wish to represent (Palestinian president or Israeli prime minister) and the violence intensity level they wish to experience during the game. Players must then make decisions in order to respond to real-life events. According to Smith and

Just (2009), autonomy deals with the level of explicit arguments presented within the game. While a low-autonomy game presents players with more arguments than a high-autonomy game, high-autonomy games are thought to elicit more self-deliberation, leading to greater self-persuasion. We argue that *PeaceMaker* is high on autonomy because it is based on reacting “strategically to in-game events” (Burak, Keylor, & Sweeney, 2005, p. 308), rather than evaluating or responding to persuasive arguments.

Integration. Integration is the extent to which an object of persuasion (i.e., a product or brand) is embedded in the game design and content. From a traditional marketing perspective, *PeaceMaker* does not have an object of persuasion per se. However, the object of the game—peaceful conflict resolution—is thoroughly embedded in all game-play aspects, which we argue makes this game an example of high integration.

Overlap. Finally, Smith and Just (2009) argue that the level of overlap between the game’s goal and its learning goal influences the level of self-persuasion. Games with high overlap force players to elaborate on the game’s learning objectives in order to win. We argue that there is a high level of overlap between the game and learning goals in *PeaceMaker*. Players in *PeaceMaker* are scored according to public approval ratings from both their own and the opposing sides. In order to win by becoming a “Nobel Prize Winner,” the player needs to learn which strategies to employ to peacefully resolve the conflict. For example, if a player in the role of Israeli prime minister were employing strategies that enhance only the Israeli side and fiercely deal with Palestinians, then the resulting score would be low, as opposed to employing strategies based on an understanding of both sides’ objectives.

Based on Smith and Just’s discussion of autonomy, integration and goals’ overlap, the current study classifies *PeaceMaker* as a persuasive video game. Next, it discusses relevant literature on attitude change, role-play, and self-persuasion to derive hypotheses about the effects of playing *PeaceMaker*.

Attitude Change, Role-Play, and Self-Persuasion

While attitude change research dates back to the early 20th century, the general concept has been historically attributed to ancient Greece and the writings of Aristotle (for a complete review see Petty & Wegener, 1998; Petty, Wegener, & Fabrigar, 1997). The concept of attitudes is clearly defined by Petty and colleagues (1997, 1998) as a set of evaluations that an individual has about himself or herself, other people, objects, and issues. Unfortunately, the clarity of this conceptual definition is not matched in operational definitions of attitude formation and change. The current study focuses on role-play as a means to persuasion and attitude change. Before describing this approach to persuasion, we will provide an overview of the structure and function of attitudes.

Petty and colleagues (1997, 1998) and Maio and Haddock (2007) hold the view that, structurally, attitudes are positive and/or negative evaluations of people, objects, and issues, deriving from the understanding of human emotion and the affect system. Instead of a one-dimensional approach that views emotion on a continuum from positive to negative, the two-dimensional approach argues that positive and negative emotions are mutually exclusive, thus can be activated simultaneously (Cacioppo,

Gardner, & Bernston, 1997; Thompson, Zanna, & Griffin, 1995). Maio and Haddock (2007) argue that, functionally, individuals utilize attitudes as a means of object appraisal and a way of experiencing emotion and affect. Object appraisal allows individuals to "simplify reasoning and behavior by providing guides for how to interact with (e.g., approach or avoid) an attitude object" (p. 568). As a result, experiencing attitudes is a form of affective experience in relation to the attitude object. Considering the way affect is processed in the brain, the four types of affective responses are extended to the types of attitudes: high negative and low positive (negative); high positive and low negative (positive); high negative and high positive (ambivalent); and low negative and low positive (indifferent) (Cacioppo, Gardner, & Bernston, 1997; Maio & Haddock, 2007).

The question this current study tries to answer is whether and in which direction would attitudes toward members of the two conflicting nations change as a function of role-play in *PeaceMaker*. To situate this research question theoretically, the following section focuses on role-play and the recent explanations of self-persuasion.

Self-Persuasion

Petty and Wegener (1998) reviewed several role-play studies in which individuals were asked to formulate and verbalize arguments rather than being exposed to a persuasive message in a passive way. Most of these studies concluded that self-induced attitude change resulting from role-play was not only stronger than other types of direct persuasion, but also lasted for longer periods of time. Research on the interplay of role-play and attitude change started in the 1950s. Janis and King (1954) assigned students to three-member debate teams, where each participant had to improvise arguments for a certain issue and present it to the two other team members. Results showed that when doing so, participants observed greater change in their attitudes and were more confident about these attitudes than those who were passively exposed to the arguments. Similarly, Elms (1966) showed that smokers playing the role of nonsmokers with the task of persuading other smokers to quit witnessed greater changes in their evaluations of smoking compared to the passive receivers of the arguments (control). Watts (1967) puts this in the framework of active versus passive participation. Active participation requires people to think about and improvise the arguments, whereas passive participation is limited to the regurgitation of arguments, if not passively receiving them from another person (Greenwald & Albert, 1968; Watts, 1967).

The effects of role-play on persuasion and attitude change have been interpreted using the concept of self-persuasion. Aronson (1999) illustrated that self-induced attitude change had far "more powerful and more long-lasting effects" when compared to direct persuasion executed by another person (p. 875). Using Festinger's (1957) cognitive dissonance theory that deals with mechanisms employed by individuals in cases where they hold ambivalent attitudes, self-persuasion theorists (i.e., Aronson, 1999; Maio & Thomas, 2007) argued that self-induced attitude change is a case of cognitive dissonance reduction. When a person engages in self-persuasion through verbalizing and/or thinking about arguments and opinions that are not necessarily congruent to his/her pre-existing attitudes, dissonance reduction comes into play, where the person adopts these arguments and opinions, thus resulting in attitude change. In order to achieve self-induced dissonance reduction, it is argued that one's ability and

motivation to elaborate on self-formulated arguments are heightened, something that is lacking in cases of direct (or passive) persuasion.

Linking changes in attitudes and behaviors to use of and exposure to video games, Anderson and colleagues (Anderson, 2004; Anderson & Bushman, 2001; Anderson & Dill, 2000) applied the General Aggression Model (GAM) to the study of violent video games. GAM deals primarily with the cultivation effect of violent games, stemming from previous theories that predicted the emergence of aggressive attitudes and behaviors as a result of exposure to violent media. Contrary to such studies, the current study deals specifically with attitudes toward other national groups and how a video game simulation of the Palestinian-Israeli conflict would elicit self-persuasion and result in changing attitudes toward the conflict's two sides. Aside from claims that attitudes and perceptions of other nations have faded away, several authors argued that it is not a matter of diminishing, but an issue of measurement and the environment that makes it essential to suppress such expressions (Devine & Elliot, 1995; Madon et al., 2001). The current study capitalizes on the assumption that Americans, as well as people from different nationalities, have certain attitudes toward Palestinians and Israelis. The following section discusses the characteristics of these attitudes.

Playing Their Role: Palestinians vs. Israelis

With this study's emphasis on attitudes of Palestinians and Israelis, it becomes important to report earlier findings about American public opinion and attitudes in this regard. Survey results from the United States, as well as European countries, showed differences in sympathies, perceptions, and attitudes toward the conflict and its two sides. American public opinion is generally more favorable toward Israelis than Palestinians (ADL, 2004; Bard, 1994; Krosnick & Telhami, 1995; Mayer, 2004; Suleiman, 1984). On the other hand, a survey conducted in 10 European countries revealed that respondents held negative opinions of actions perpetuated by both sides, such as suicide bombings carried out by Palestinians targeting Israeli civilians, and Israel's construction of the separation wall (ADL, 2004).

It is beyond the scope of the current paper to discuss the reasons behind such poll results or their depiction of reality within the American society. While we take the discrepancy in evaluation of both sides into consideration, the crux of the hypotheses rely on attitude change, rather than surveying current attitudes toward both peoples. This gap in favorability of Palestinians and Israelis leads us to assume that playing *PeaceMaker* and the outcomes associated with this experience would vary as a function of the role assigned to participants. We argue that playing the role of Israeli prime minister would be congruent to pre-existing attitudes, while playing the role of Palestinian president would be incongruent to pre-existing attitudes.

The minimal group paradigm (MGP; Tajfel, Billig, Bundy, & Flament, 1971; Tajfel, 1982; Van Bavel & Cunningham, 2009) that deals with self-categorization and bias reduction might be helpful in deriving the current study's hypotheses. MGP deals with means of reducing bias by changing the salience of the categorization attribute. Generally, in MGP studies, participants are exposed to pictures of both Black and White Americans, and instructed to memorize not their racial categorization, but rather an irrelevant type of group membership (i.e., Lions vs. Tigers). Participants are randomly assigned to identify

themselves as members of either group and, therefore, they end up evaluating the pictures on the basis of a new form of ingroup-outgroup (i.e., Lions vs. Tigers) rather than racial categorization (i.e., Black vs. White). Tajfel and colleagues consistently found that participants' evaluated outgroup members more negatively than ingroup pictures regardless of their racial/ethnic background. Van Bavel, Packer, and Cunningham (2008) even found support for this hypothesis using functional Magnetic Resonance Imaging (fMRI), where regions of the brain traditionally activated while evaluating ingroup faces were activated based on the novel categorization (i.e., Lions vs. Tigers) and not on the basis of ethnicity (i.e., Black vs. White).

Since we classified *PeaceMaker* as a persuasive video game (Bogost, 2006, 2007; Smith & Just, 2009) that leads to change of attitudes through self-persuasion (Aronson, 1999; Maio & Thomas, 2007) as a function of role-play, we predict that the nationality of the role played would influence evaluations of the two nations in distinct ways. We hypothesize that playing the role of Israeli prime minister would not constitute any considerable change in categorization, due to the assumption that participants would express higher favorability for Israelis compared to Palestinians at the baseline. In addition, we hypothesize that playing the role of Palestinian president would lead to an increase in favorability of Palestinians, and a decrease in favorability of Israelis. Thus, we hypothesize:

H1: Participants who play the role of Palestinian president will exhibit unfavorable attitude change toward Israelis, compared to those playing the role of Israeli prime minister, who will not exhibit any considerable attitude change toward Israelis.

H2: Participants who play the role of Palestinian president will exhibit favorable attitude change toward Palestinians compared to those playing the role of Israeli prime minister who will not exhibit any considerable attitude change toward Palestinians.

Implicit Attitudes

To this point we have focused on the role of video game play in causing changes in explicit attitudes towards Israelis and Palestinians. We also attempted to look at the role of video games with respect to implicit attitude change. In the past few years, there has been a plethora of studies addressing the *how* of measuring implicit attitudes (i.e., Cunningham, Preacher, & Banaji, 2001; Greenwald & Farnham, 2000; Greenwald, McGhee, & Schwartz, 1998; Greenwald, Nosek, & Banaji, 2003). Previous attitude models and means of measuring their implicit existence and/or activation, such as the implicit association test (IAT), have been criticized for their lack of consistent empirical support and validity in capturing actual attitudes (Payne, Cheng, Govorun, & Stewart, 2005).

In a nutshell, such models distinguish between what individuals express and what they think or how their brain functions (executive control function; Macrae & Bodenhausen, 2001; Macrae, Bodenhausen, Schloerscheidt, & Milne, 1999). This discrepancy between what is verbalized and what is thought is an interesting and relevant addition to this research. While this paradigm is commonly employed in categorical person perception (in-group vs. out-group) and racial stereotypes research, its application to the relationship between communication technology and the study of attitudes about people

from other nations and cultures is somewhat novel. In this study, we employ Payne and colleagues' (2005) Affective Misattribution Procedure (AMP), which is a more recent paradigm for assessing implicit attitudes. AMP was reported in a series of recent experiments (Payne, Cheng, Govorun, & Stewart, 2005) in which participants were primed with pictures of members from certain racial or political groups and then asked to rate unrelated Chinese pictographs in an attempt to trace a misattribution effect as an expression of affective evaluation of those pictographs.

Based on the linkage between role-play, self-persuasion, and attitude change, we are reformulating the previous hypotheses to research questions related to the change of implicit attitudes as a function of playing *PeaceMaker* in the different treatment conditions. The following research question is exploratory, where we aspire to highlight differences in attitude change between explicit and implicit measures:

RQ1: How do participants' implicit attitudes toward Palestinians and Israelis change after playing PeaceMaker as a function of their nationality assignment (Palestinian president vs. Israeli prime minister)?

Method

Participants

Participants (N=68; 74% female; mean age=20) were recruited from an introductory undergraduate advertising course at a large Midwestern university, and received course credit in exchange for their participation. Participants were not screened for specific ethnicities or religious beliefs. Responses from 10 participants to explicit attitude measures were evaluated as outliers and were discarded, leaving 58 responses for relevant statistical analyses. Responses of seven participants to implicit attitude measures (AMP) were discarded due to computer malfunction and two additional participants' responses were evaluated as outliers and were discarded, thus resulting in a sample size of 60 for those analyses.¹

¹ All variables included in statistical analyses were submitted to diagnostic statistical tests to assess whether they satisfy the assumptions of analysis of variance (ANOVA). Results indicated the following: (1) the ratios of skewness and kurtosis to their respective standard error values were above |2|, (2) both Komogorov-Smirnov and Shapiro-Wilk statistics for each of our variables were significant. Based on this, we concluded that the variables were not normally distributed, thus the need to carry out univariate and multivariate outlier analyses. Ten cases for explicit measures and two others for implicit measures that were 2 SDs above or below the mean were assessed as univariate outliers. Using Mahalanobis distance and corresponding χ^2 values, no multivariate outliers were detected. The 10 outliers were closely inspected, and it was evident that the majority of them could have resulted from response bias. Next, we ran all statistical analyses for our hypothesis testing, once with the outliers included, and another time with the outliers excluded, which indicated little difference in the F-values, effect sizes and power, with no difference in terms of the significance of the statistical tests. Based on this, and to ensure that we satisfied the assumption of normality needed for ANOVA tests, we decided to discard the outlier cases from the data set.

Design

The study utilized a 2 (nationality assignment: Palestinian president vs. Israeli prime minister) x 2 (time: pre-play vs. post-play) mixed factorial design, with repeated measures on the second factor.

Independent Variables

Nationality Assignment. Participants were randomly assigned to play the role of either the Palestinian president (N=35) or the Israeli prime minister (N=33). Playing a certain role does not entail any structural or content-related differences in the game, as the game follows the same procedures regardless of nationality assignment.

Time. Time was a within-subject factor, where all participants responded to both the pretest and post-test questionnaires, before and after playing the video game.

Dependent Measures

National Attitudes. The measure for national attitudes about Palestinians and Israelis was borrowed from two studies (ADL, 2004; Mayer, 2004), where respondents were asked to rate seven statements about each national group regarding the following: (1) favorability; (2) sympathy; (3) belief about the national group's intention for peace; (4) intentionally targeting civilians from the other side (reverse-coded); (5) being democratic; (6) being responsible for the violence (reverse-coded); and, (7) having the right to sole control over the city of Jerusalem. These items were repeated for each national group in both the pretest and post-test, thus resulting in four different scales: pretest and post-test attitudes toward Israelis and Palestinians. Each of these four scales was submitted to an exploratory factor analysis, where all items loaded well. All four scales were shown to be reliable despite the small sample size ($M_{Cronbach's \alpha} = .71$).

Implicit attitudes. Borrowing Payne and colleagues' (2005) procedure, participants completed an affective misattribution procedure task (AMPs) twice; once in the pretest and another time in the post-test. The two tasks were exactly the same, where participants were exposed to portrait pictures of Israelis (12 pictures) and Palestinians (12 pictures). These photographs were chosen from a pool of 70 photographs. The original photograph pool was pretested with another group of participants (N=41²), where they were asked to identify whether the portrait owner is Palestinian or Israeli, as well as rating each picture's valence and arousal using SAM scales (Bradley & Lang, 1994). The 24 pictures selected for the AMP were the most accurately recognized in terms of the nationality of the picture's subject and received comparable moderate ratings of valence and arousal. Pictures differed significantly in terms of valence³ $t(34) = -4.28, p < .001$, with higher positive ratings of Israeli ($M = 5.27, SD = .52$) than

² Responses of six participants were discarded after necessary univariate (± 2 SD) and multivariate (Mahalanobis distance) outlier analyses.

³ While the difference in valence ratings was statistically significant, the mean difference is merely 0.29 on a 9-point scale. In addition, valence ratings are intertwined with attitude evaluations (Maio & Haddock,

Palestinian pictures ($M = 4.98$, $SD = .52$). Arousal ratings were moderate for both Palestinian ($M = 4.78$, $SD = .50$) and Israeli ($M = 4.63$, $SD = .69$) pictures, $t(34) = 1.61$, *ns*.

Implicit attitude scores were calculated before and after the test for each national group. The score is composed of the percentage of trials on which the participant rated the Chinese pictograph as pleasant relative to the overall number of trials.

Procedure

Upon entering the laboratory, participants gave written informed consent and were seated in front of a personal computer equipped with a 17-inch screen. The experiment was described in detail to participants, and then they were instructed to complete the pretest. The pretest included the explicit attitude measure (administered through MediaLab) (Jarvis, 2008a), and the AMP (administered through DirectRT) (Jarvis, 2008b). With regard to the AMP, A similar procedure to that of Payne and colleagues (2005) was followed. Participants were informed that they would be seeing pictures of Israelis and Palestinians, followed by Chinese pictographs. They were instructed to rate the Chinese pictographs as either pleasant or unpleasant using clearly marked keys on the computer keyboard. Participants were warned that seeing the pictures of Palestinians and Israelis might influence their rating of the pictographs, and were told to try and respond as quickly as possible. For each trial, participants were exposed to a white mask (1,000 ms), the picture of either a Palestinian or an Israeli (75 ms), another white mask (125 ms), a random Chinese pictograph (100 ms), and a noise mask where response time was recorded. Each AMP task included 24 pictures; 12 for Palestinians and 12 for Israelis, which were presented to participants in random order.

After completing the pretest, participants played *PeaceMaker* for 20 minutes⁴, where they were randomly assigned to play as either the Israeli prime minister or the Palestinian president. The experimenter described basic game features to participants and instructed them that if the game ended before time was up, then they could start a new game with the same treatment condition. Each participant's game play was recorded through CamStudio screen capture software for future analyses. After 20 minutes of game play, participants were advanced to the post-test questionnaire and AMP. Upon completion of the experiment, participants were debriefed, thanked, and dismissed.

Results

Before reporting the results of hypotheses testing and answering the research questions, it is important to highlight a few descriptive results regarding the data from the explicit attitude

2007), therefore, considering the fact that these pictures were the most recognized by participants, we cannot disregard the possibility that valence evaluations are also based on pre-existing attitudes and stereotypes.

⁴ Game-play time was allocated based on Ravaja's (2009) study indicating that arousal diminished after 15 minutes of video game play. We added 5 minutes to accommodate a brief introductory video (3.5 minutes) and a text-based description of the game.

questionnaires. Table 1 shows a breakdown of national attitudes toward Palestinians and Israelis before and after playing *PeaceMaker* as a function of nationality assignment. First, t-test comparison between the two role-play conditions showed no significant differences with regards to attitudes toward Israelis ($t(57) = -1.16, ns$) and attitudes toward Palestinians ($t(57) = 1.51, ns$). This illustrates that randomization has been achieved. Second, results show that at the baseline in the pretest, for all treatment conditions, participants had more positive attitudes toward Israelis than Palestinians. This gap is bridged in the post-test, where attitudes toward Palestinians positively change and those toward Israelis negatively change. Paired-samples t-test results, illustrated in Figure 2, show that pre-test attitudes toward Israelis were significantly higher than attitudes toward Palestinians ($t(57) = 3.08, p < .01$), while in the post-test, the difference between the two national groups was not significant ($t(57) = -1.38, ns$). These results confirm our assumption that American students' evaluation of Israelis was more positive than their evaluation of Palestinians, as well as confirm our overarching hypothesis that playing *PeaceMaker* results in attitudinal change toward Palestinians and Israelis. To test the different hypotheses and answer the research question, repeated measures ANOVA were carried out to map out the main effects of the independent factors and the interactions among them in affecting attitudinal change.

Table 1. Mean Scores and Standard Deviations for Explicit Attitudes Toward Palestinians and Israelis Before and After Playing *PeaceMaker* as a Function of Nationality Assignment.

Treatment Conditions	Attitudes toward Palestinians ^a			Attitudes toward Israelis ^a		
	Pre-test	Post-test	p^b	Pre-test	Post-test	p^b
Palestinian President	3.77 (.47)	4.03 (.49)	*	3.92 (.50)	3.42 (.68)	**
Israeli Prime Minister	3.54 (.69)	3.69 (.44)	<i>ns</i>	4.08 (.52)	4.05 (.61)	<i>ns</i>
Total	3.67 (.59)	3.88 (.66)	*	4.15 (.78)	3.82 (.91)	**

Notes. ^a Means for seven scale items measured on a 7-point rating scale (1=Strongly Disagree, 7=Strongly Agree), standard deviations in parentheses. ^b p -values based on pair-wise comparisons.

*** $p < .001$, ** $p < .01$, * $p < .05$

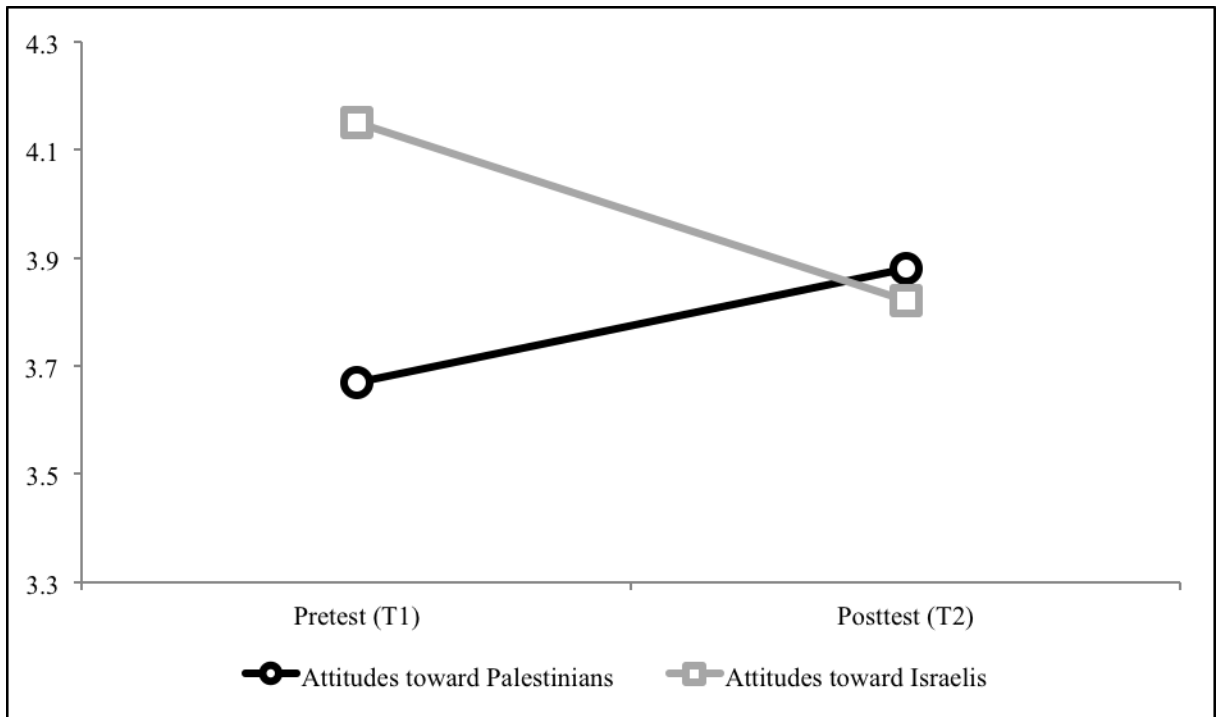


Figure 2. Explicit attitudes toward Israelis and Palestinians before and after treatment.

Explicit Attitudes

The study's two hypotheses predicted a change in participants' explicit attitudes toward Palestinians and Israelis as a function of playing the role of either the Palestinian president or the Israeli prime minister. H1 predicted a negative change in attitudes toward Israelis of those playing as Palestinian president and no change in attitudes toward Israelis for those playing as Israeli prime minister. Conversely, H2 predicted a positive change in the attitudes toward Palestinians of those playing the role of Palestinian president with no considerable change in attitudes toward Palestinians of those playing the Israeli prime minister role.

To test H1, data for the attitudes toward Israelis were submitted to a 2 (nationality assignment) x 2 (time) repeated measures ANOVA. The results showed a significant main effect for nationality assignment ($F(1,56) = 10.97, p < .01, \text{partial-}\eta^2 = .16$), and a significant main effect of time ($F(1,56) = 6.98, p < .05, \text{partial-}\eta^2 = .11$). As illustrated in Figure 2, these main effects were qualified by a significant nationality assignment by time interaction ($F(1,56) = 5.85, p < .05, \text{partial-}\eta^2 = .10$). Participants assigned to play the role of Palestinian president observed a negative change in their attitudes toward Israelis when comparing responses to the pretest ($M = 3.92, SD = .51$) and the post-test ($M =$

3.42, $SD = .68$). Pair-wise comparisons showed that this negative change in attitudes was significant ($t(31) = .59, p = .001$). On the other hand, participants assigned to play the role of Israeli prime minister did not observe a significant change in their attitudes toward Israelis ($t(25) = .162, ns$) when comparing responses to the pretest ($M = 4.08, SD = .52$) and the post-test ($M = 4.05, SD = .61$). Hypothesis 1 was supported.

H2 dealt with the change of attitudes toward Palestinians as a function of playing *PeaceMaker* in the two nationality assignment conditions. Data for the explicit attitudes toward Palestinians were submitted to a 2 (nationality assignment) x 2 (time) repeated measures ANOVA. Results showed that there was a significant main effect for nationality assignment ($F(1,56) = 6.36, p < .05, partial-\eta^2 = .10$), and a significant main effect of time ($F(1,56) = 5.94, p < .05, partial-\eta^2 = .10$). However, these main effects were not qualified by a significant nationality assignment by time interaction ($F(1,56) = .44, ns$). Pair-wise comparisons showed that those playing the role of Israeli prime minister had no considerable change in their evaluations of Palestinians ($t(32) = -1.11, ns$) between the pretest ($M = 3.54, SD = .69$) and the post-test ($M = 3.69, SD = .44$). On the other hand, those playing the role of Palestinian president had a significant increase in their favorability toward Palestinians ($t(34) = -2.47, p < .05$) between the pretest ($M = 3.77, SD = .49$) and the post-test ($M = 4.03, SD = .49$). Hypothesis 2 was supported.

To look at the data in a more comprehensive way, a 2 (nationality assignment: Palestinian president vs. Israeli prime minister) x 2 (national group⁵: Israelis vs. Palestinians) x 2 (time: pretest vs. post-test) repeated measures ANOVA was computed. Results showed a significant interaction between nationality assignment and national attitudes ($F(1,56) = 17.10, p < .001, partial-\eta^2 = .23$), a significant interaction between national attitudes and time ($F(1,56) = 11.61, p < .01, partial-\eta^2 = .17$), and a significant three-way interaction between nationality assignment, national attitudes and time ($F(1, 56) = 4.63, p < .05, partial-\eta^2 = .08$). Participants who played the role of Israeli prime minister, did not observe any considerable change in their favorability toward Israelis ($t(25) = .162, ns$) and Palestinians ($t(25) = -1.11, ns$; See Figure 3A). On the other hand, those playing the role of Palestinian president observed a significant decrease in their favorability of Israelis ($t(31) = 3.59, p = .001$) and a significant increase in their favorability of Palestinians ($t(31) = -2.47, p < .05$) as a function of playing *PeaceMaker* (See Figure 3B).

⁵ National group, as an independent variable, refers to including attitudes toward both Israelis and Palestinians in the ANOVA model.

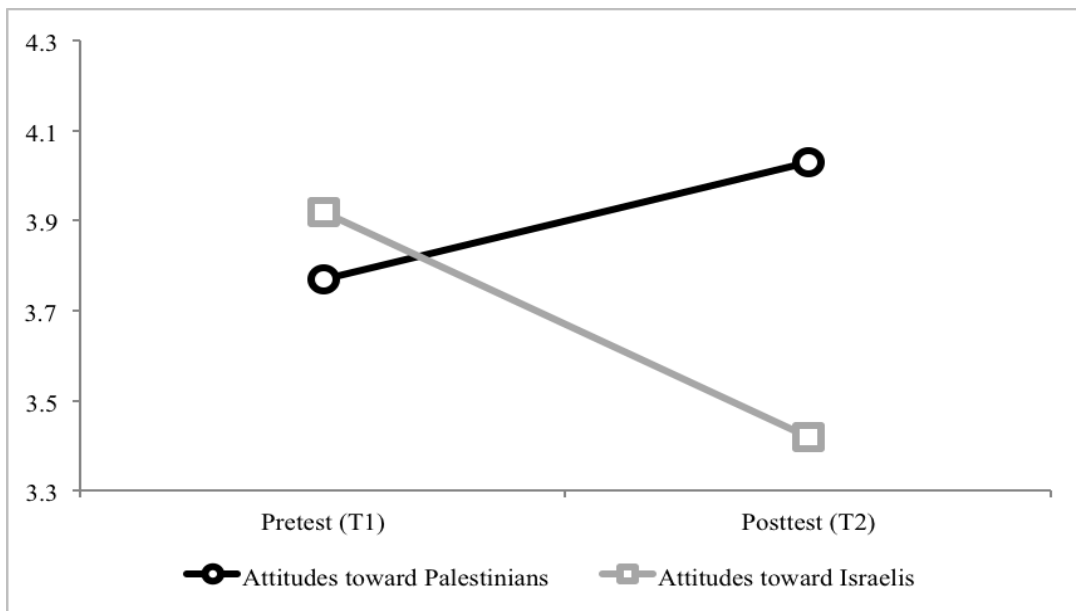
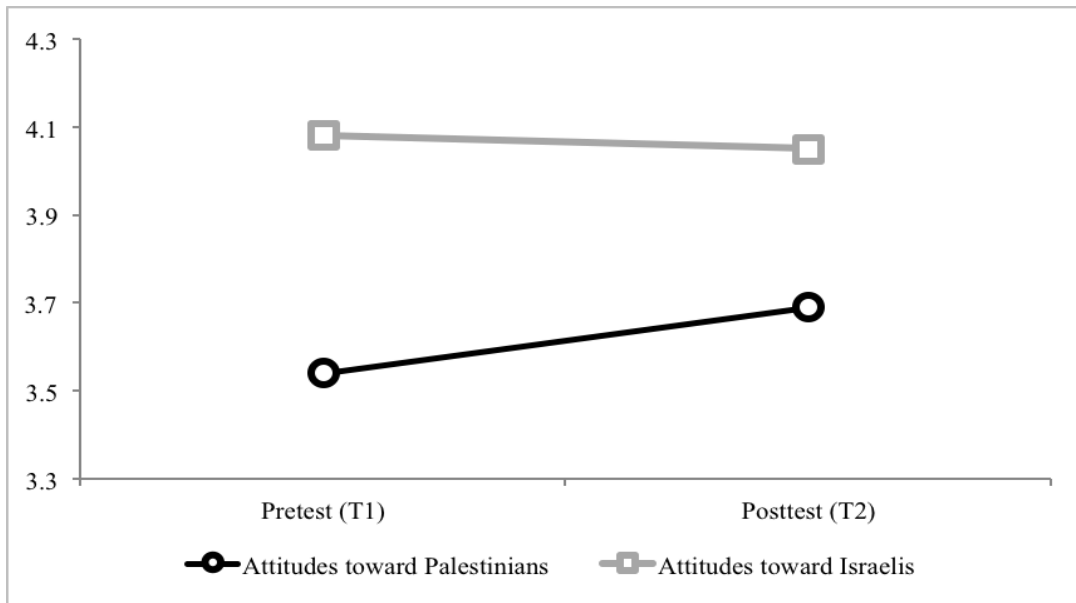


Figure 3. Results of attitudes toward Palestinians and Israelis before and after playing PeaceMaker, as a function of national assignment: Israeli prime minister (3A—Top) and Palestinian president (3B—Bottom).

Implicit Attitude Measures

This study also investigated whether playing *PeaceMaker* would affect participants' implicit attitudes toward Palestinians and Israelis as a function of nationality assignment (RQ1). Before answering this research questions, we should note that in the pretest, participants evaluated pictures of Palestinians ($M = .65, SD = .22$) as more pleasant than those of Israelis ($M = .60, SD = .20$), where the difference was marginally significant ($t(59) = 1.83, p = .07$), and this trend was maintained and became statistically significant in the post-test ($t(61) = 2.60, p < .05$), where participants evaluated pictures of Palestinians ($M = .65, SD = .21$) as more pleasant than those of Israelis ($M = .59, SD = .23$).

To answer RQ1, implicit attitudes toward Israelis were submitted to a 2 (nationality assignment) x 2 (time) repeated measures ANOVA. Results showed that the main effects of nationality assignment ($F(1,58) = 1.56, ns$) and time ($F(1,58) = .41, ns$) were not statistically significant, as well as the nationality assignment by time interaction ($F(1,58) = 1.06, ns$). Similarly, the same pattern was observed with implicit attitudes toward Palestinians, where neither the main effect of nationality assignment ($F(1,58) = 2.31, ns$), main effect of time ($F(1, 58) < .001, ns$), nor the interaction between these two variables ($F(1, 58) = 1.52, ns$) were statistically significant.

Discussion

The current study employed a controlled experiment to investigate the effect of *PeaceMaker*, a video game simulation of the Palestinian-Israeli conflict, on the change of American students' attitudes toward Palestinians and Israelis as a function of nationality assignment. Before playing *PeaceMaker*, participants had a general tendency to express more favorable views of Israelis than Palestinians. However, after playing *PeaceMaker* for 20 minutes, participants' self-reported attitudes changed significantly. The overall evaluations of Palestinians positively changed, and those of Israelis negatively changed after playing *PeaceMaker*. Moreover, such changes were observed with participants assigned to play the role of Palestinian president and not the role of Israeli prime minister. These results are in line with previous research dealing with the effects of role play on attitude change (Elms, 1966; Greenwald & Albert, 1968; Janis & King, 1954; Watts, 1967), especially that playing a role contradictory to one's previous attitudes, in this case the role of a Palestinian president as opposed to an Israeli prime minister, induced greater attitudinal change.

Using the minimal group paradigm (Tajfel, Billig, Bundy, & Flament, 1971; Tajfel, 1982; Van Bavel & Cunningham, 2009), the current study provides new insights to the study of video game effects. While much of previous research focused on the effects of violent video games (i.e., Anderson, 2004; Anderson & Bushman, 2001; Anderson & Dill, 2000), our results illustrate that playing role-play video games can lead to positive changes in attitudes toward foreign nations. More specifically, the results indicate that attitude-change was congruent to the role that participants played, thus leading us to postulate that a short period of video game play was sufficient to induce changes to the cognitive structures guiding the categorization of the two national groups. Indeed, this finding is limited to the short-term effects, as our measures were employed right after the game-play experience. Future research should explore the long-term effects of video games on attitude and behavior changes. Such research

should be informed by previous theoretical models, such as the General Aggression Model (GAM; Anderson & Bushman, 2001) and other models of the longer-term media effects (e.g., cultivation; Gerbner, Gross, Morgan, & Signorielli, 2002) to shed light on potential positive media effects on individuals' attitudes and behaviors.

Another interesting finding from this study deals with the discrepancy between explicit (self-reported) and implicit attitude responses. As shown in the results, the AMP (Payne et al., 2005) as a measure of implicit attitudes reflected a contrasting view from explicit measures at the baseline before playing the game. Participants rated pictures of Palestinians as more pleasant than pictures of Israelis, yet no considerable change in these ratings was observed as a function of playing *PeaceMaker*. The fact that participants did not change their implicit attitudes of the two national groups as a function of playing the game supports the claims of the associative propositional evaluation (APE) model, where attitude change that is facilitated by cognitive dissonance would be observed on the explicit, but not the implicit, level (Gawronski & Bodenhausen, 2006). Macrae and colleagues (Macrae & Bodenhausen, 2001; Macrae et al., 1999) distinguished between automatic and controlled evaluations based on the understanding of the executive control function that detects conflict in evaluations and withholds the expression of bias.

Taken together, our results suggest that self-induced attitude change resulting from playing persuasive games is maintained on the explicit, but not the implicit, level, thus notwithstanding any changes to the cognitive structures that are associatively linked to categorizing and evaluating members of social/ethnic/national groups. Instead, video game role-play leads to bias reduction through the activation of cognitive control exerted over the expression of prejudiced thinking. In the case of evaluating Palestinians and Israelis, American students might not feel politically incorrect to express bias toward one side over the other, compared to social inhibitors found when evaluating domestic social groups (e.g., Blacks). Playing *PeaceMaker* provides participants with a framework of reference that adjusts their bias by inhibiting the expression of negative evaluations. This informs the study of persuasive games by explicating the cognitive and emotional processes involved with procedural rhetoric (Bogost, 2007; Smith & Just, 2009). To further validate this claim, future research should employ more sophisticated measures of cognition and emotion in relation to group evaluations, including, but not limited to, psychophysiological (e.g., heart rate, skin conductance, facial EMG) and other implicit measures.

There are a few limitations worth noting. First, the current study measured the short-term effects of video game play on attitude change rather than the long-term effects on attitudes and behaviors. Future studies should focus on measuring these changes over an extended period of time. Second, the study used pictures of Palestinians and Israelis to measure implicit attitudes that could have appeared indistinguishable to the American sample due to the lack of exclusive physical features that separate people of the two nations (i.e., skin color, nose shape, etc.). Finally, the allocated time to play *PeaceMaker* (20 minutes) might not have been reflective of actual behavior of video gamers, which hinders the external validity of the study's findings. Future studies should investigate the effects of game play time on attitude change.

The current study's theoretical findings are applicable to various fields, such as policy-making, diplomacy, negotiations, and conflict resolution. The study shows that new media, specifically persuasive

video games, are capable of inducing changes in attitudes about other nations, as well as promoting and educating the younger generations about peace, and informing them about other nations and the world around them beyond existing attitudes and stereotypes. Future research should use groups of Palestinians and Israelis to test the effects of *PeaceMaker* on changes to attitudes of the *other* and attitudes toward the peace process. While face-to-face interaction is limited and precluded, computer-mediated communication, much like playing *PeaceMaker*, has the potential of facilitating conflict resolution beyond existing sociopolitical norms (Walther, 2009). Also, additional delayed measurement of both explicit and implicit attitudes might be useful in illustrating long-term behavioral changes and not only immediate attitudinal changes.

In conclusion, the current study illustrated that a short period of video game role-playing led to changes in explicit evaluations of foreign nations. The fact that implicit evaluations did not change significantly as a function of the treatment paves the way for further exploration of self-induced attitude change via interactive media and virtual environments.

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