

Representation of History in Computer Games and Attitude Change: Empirical Study Design

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Abstract: Historical computer games are becoming a common form through which we engage the past. Until today, only limited empirical research has been conducted about effects of these games on players' attitudes. The empirical study proposed in this paper aims to measure the ability of a historical game to affect the players' implicit and explicit attitudes towards historical topics represented in the game. Participants will be gradually exposed to two sets of contradicting perspectives on historical events contained in the chosen game. Both sets of perspectives possess different potential for possible in-group bias of the Czech participants. The primary aim of this research is to evaluate effect of this intervention on participants' short- and long-term attitude changes towards contested historical topics and also the effect of the possible in-group bias. We will use a modified version of a serious educational game "Czechoslovakia 38-89: Borderlands" as a research tool. The game, developed together with Czech historians and teachers, depicts the post-WWII arrangement in Czechoslovakia, including the expulsion of Sudeten Germans and the rise of communism to power. The game allows players to experience represented historical events through the eyes of eyewitnesses and offers multifaceted perspectives of these events. Pilot study of this research was carried out in April 2017. It consisted of a laboratory experiment, in which the participants (N=18) were exposed to two contradicting perspectives on the expulsion of the Sudeten Germans from Czechoslovakia through playing the game. The order of these perspectives was different for each experimental group (between-subject design). The aim was to verify the viability of the research design and to evaluate if the game is able to change the participant's attitudes. Data collection during the study measured explicit and implicit attitudes followed by qualitative focus groups. The data from the pilot study are being analyzed in the time of writing this paper, yet the preliminary results suggest the usability of our method. For the final study, we also plan to collect the similar data one month after the intervention in order to evaluate longitudinal attitude change. Overall, the research aims to evaluate if and at what level attitude change occurs in relation to events represented in the game. In a broader perspective our research aims to deepen our understanding of formation of historical awareness in the 21st century.

Keywords: attitude change, historical computer games, perspective taking, experimental study, Czechoslovakia 38-89: Borderlands

1. Introduction

Computer game developers are often inspired by real historical events or periods. By dealing with those historical themes, they must necessarily create digital representations of those events and frame them in a certain way. Especially among the younger generation historical computer games became the most common form of popular history, possessing the potential to influence the formation of historical awareness in the society (Chapman 2013; 2016; Kapell and Elliott 2013).

This empirical study aims to evaluate the ability of historical computer games to affect the players' attitudes towards the historical topics represented in the game. The research questions of this study are: (1) How does a specific framing of historical events in a game influence the players' explicit and implicit attitudes towards these events? (2) How can we empirically measure the explicit and implicit attitudes change? (3) How is the possible attitude change influenced by the participants' initial attitudes and in-group bias?

In particular, we will use a modification of the historical game "Czechoslovakia 38-89: Borderlands" and measure players' attitude changes towards the expulsion of Sudeten Germans, i.e. an event that is portrayed from different perspectives in the game. Participants will be divided into two groups and exposed to two different sets of perspectives: one of the expelled Germans and one of those Czechs who played an active role in the expulsion. We will measure the changes of explicit attitudes (pen-and-paper test) and implicit attitudes (computer-administered SC-IAT test) via pre-tests, immediate post-tests, and delayed post-tests.

Our preliminary hypotheses are as follows: (1) Immediate change of explicit attitudes towards the historical events depicted in the game will be larger than the change of similar implicit attitudes. (2) Participants with weak initial attitudes towards the historical topic depicted in the game will be more likely immediately affected by the intervention than participants with strong initial attitudes towards that event. (3) State of participants' initial

implicit attitudes towards the historical events will be a determining factor for persistence of possible explicit attitude change in long-term measurement.

The goal of the present paper is to present the theoretical background for the study and design of the experiment. The paper also introduces the pilot study having been carried out during April 2017.

2. Theoretical background

Attitudes represent one of the basic concepts in social psychology. According to Bohnet and Dickel (2011), "Attitude is an evaluation of an object of thought. Attitude objects comprise anything a person may hold in mind, ranging from the mundane to the abstract." This definition is generally agreed upon, argument is however about the relation between the conscious (explicit attitudes) and subconscious attitudes (implicit attitudes), since there is often low correlation between the results of their measurement towards the same phenomena (Payne et al, 2008; Nosek 2007). Some researchers assumed the existence of two different constructs (e.g. Gawronski and Bodenhausen 2007). More recent findings by Echabe (2013) are however contradictory to the theory of two different constructs. These findings indicate that the low correlation is caused mainly by distinct conditions and methods used for data collection of explicit and implicit attitudes. We therefore approach the construct of implicit and explicit attitudes as a one influenced by several different factors. We try to minimize these factors in our study design.

Another debate is about the persistence of the attitudes: whether they are "stored" in memory (Fazio 2007; Petty, Briñol and DeMarree 2007) or constructed on the spot (Schwarz 2007, Gawronski and Bodenhausen 2007). With respect to this issue we use the concept of attitude strength (Petty and Krosnick 1995, Maio and Haddock 2010) assuming that if the attitudes are stronger, they are also more stable over time and across various situations, i.e. they are likely to predict behavior and influence information processing.

There exist a number of empirical studies on attitude change related to exposure to movies (e.g. Bateman, Sakano and Fujita 1992; Adams et al. 1985; Stroud 2007). Generally, these studies have confirmed the ability of movies to change attitudes. Similar studies on computer games also exist. (see, e.g., Cuhadar and Kampf 2014; 2015; for comprehensive review of the studies evaluating the effect of serious games on attitudes see also Soekarjo and Oostendorp 2015). Although these studies indicate the possibility of serious historical games to change players' attitudes towards the depicted events, they typically measure explicit attitudes only and focus solely on participants' short-term attitude change. Studies on computer games measuring implicit and explicit attitudes are limited and scarce (cf. Saleem 2008).

Unlike the existing studies, our empirical study aims at measuring both explicit and implicit attitudes and evaluating not only short-term attitude change but also long-term attitude change towards the contested historical topics (i.e. one month after the intervention) depicted from various perspectives.

3. Methods

As a research tool we will use a modified version of a serious educational game "Czechoslovakia 38-89: Borderlands" (see Figure 1 and Figure 2.). The game depicts Second World War and post-War arrangement in Central Europe tackling multiple historical topics, e.g. coexistence of Czechs and Germans in border regions of Czechoslovakia, forced expulsions of Sudeten Germans, resettlement of borderlands, the rise of communism to power, etc. The game consists of dialogues, interactive comics and thematic mini-games. It was developed together with Czech historians and teachers. It is currently successfully implemented in Czech high schools as a learning tool. The game allows students to experience represented historical events through the eyes of its "eyewitnesses", offering students multifaceted perspective on these events.

Since the participants of the study will be Czechs with possible strong attitudes and in-group bias to the historical themes depicted in the game, second similar version of the game is currently being developed that will be used to avoid possible in-group bias and to measure the effect of attitude strength on its possible change. The second game will be identical to the first one with one exception: as the game design allows it, all the in-game historical references to the situation in Central Europe will be replaced by references to the Spanish Civil War in 1936-1939.

The study will use a between-subject design. Participants will be gradually exposed to two sets of contradicting perspectives towards the historical events contained in “Czechoslovakia 38-89: Borderlands” in a pre-defined order. After the initial quantitative implicit, SC-IAT, and explicit attitudes measurement (pre-test) participants will be exposed to the part of the game containing the first set of game perspectives (interaction with the story of expelled Sudeten German and the story of war survivor with mixed Czech-German ancestors). Thereafter, participants’ attitudes towards the expulsion of Sudeten Germans will be evaluated using quantitative implicit and explicit attitudes measurement (first immediate post-test). Subsequently the participants will be exposed to the second part of the game (interaction with the story of resistance fighter who became a member of Revolutionary guards and took active part in the expulsions). After that the last attitudes measurement (second immediate post-test) and qualitative focused groups will follow. In order to evaluate possible implicit egotism (Devos 2008), the part of the game to which the participants will be exposed first will vary based on their group, since the second part of the game narrates the story of the Czech resistance fighter, which may unconsciously activate positive attitudes toward self-related group as all the participants will be Czech (Devos and Banaji 2003). One month later we will collect the similar data to identify long-term effects of the intervention on the attitude change.



Figure 1: A demonstration of interactive comics from Czechoslovakia 38-89: Borderlands



Figure 2: A demonstration of dialogue from Czechoslovakia 38-89: Borderlands

Until recently the most common forms of attitude measurement focused on explicit attitudes, using self-reports. So-called motivated response bias is a limitation of these methods – respondents tend to adjust their answers

in order to comply with socially desirable or respectable characteristics (Albarracín, Johnson and Zanna 2014; Bohnet and Dickel 2011). To overcome this, implicit attitudes measurement methods, such as Implicit Attitude Test (IAT) (Greenwald et al., 1998), gained on its popularity during the last 20 years. Unlike the explicit attitude measurements, IAT is based on the premise that attitude objects can spontaneously activate evaluations, which influences response times.

Original IAT evaluates relative relation between the two attitude objects, such as in a study of McConnell and Leibold (2001) who used IAT to compare participants' attitudes towards Afro-American and Caucasian people. Since we are verifying attitudes towards the specific historical event (the expulsion of Sudeten Germans from Czechoslovakia) with no unambiguous counterpart, original implicit association test was unsuitable for our research. Therefore, we plan to use single category implicit association test (SC-IAT), which measures strength of evaluative associations with single attitude object (Karpinski and Steinman 2006). SC-IAT software for data collection was created using Psychopy2 Experiment Builder (Peirce 2007; 2009) and modifying the existing script of Hussey (2016) (see Figure 3).

To verify our assumptions about the relation between implicit and explicit attitudes we will also collect the data about the existing initial participant's explicit attitudes. We plan to use our modification of Likert's (1932) method of Summated ratings and Osgood, Suci and Tannenbaum's Semantic differential (1957). Implicit and explicit attitudes measurement will be followed by qualitative focus groups. All the data from both groups will be also collected one month after the end of the intervention to verify evolution of possible attitude changes among the participants.

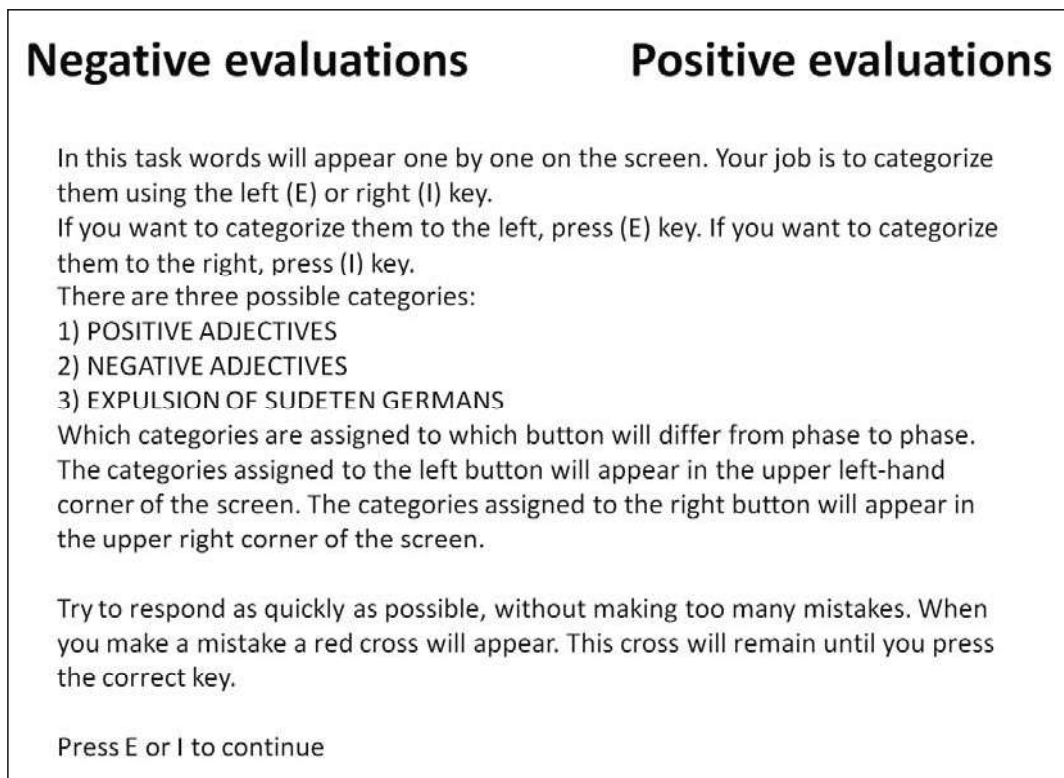


Figure 3: A demonstration of initial instructions in SC-IAT

4. Pilot study

In April 2017, we have conducted a pilot study of our research design. Our aim was to evaluate three aspects of our experiment (1): the feasibility of the experiment on the organizational level, (2) design of questionnaires, including the suitability of chosen evaluation adjectives for explicit attitudes measurement, (3) verification of functionality of developed SC-IAT software and the modified version of "Czechoslovakia 38-89: Borderlands," (4) ability of the game to change the participant's attitudes when exposed to the historical topics from various perspectives in different order.

We recruited 18 participants (4 females and 14 males) between the ages of 20 to 26 ($M=23.94$; $SD=1.78$). All of them were university students with specialization on computer science and new media studies. Undergraduate students represented about 28 % and graduate students about 72 % of participants. The experimental procedure was as described in Section 3, with the following exception: no one-month delayed measurement was administered.

The pilot study has brought satisfactory results. The organization of the experiment has become standardized and well documented. Instructions of our questionnaires and several evaluation adjectives had to be slightly modified during the pilot study to reflect the feedback of participants in qualitative focus groups. Developed software proved itself stable with no need of significant changes except for the change of evaluation adjectives in SC-IAT. The data from pilot study are being analyzed in the time of writing this paper, however a preliminary analysis suggests that our research design is viable. Importantly, the results suggest that (1) both the pen-and-paper explicit attitudes test and the computer-administered SC-IAT test do measure attitudes change and (2) the specific framing of historical events in the game influences players' attitudes towards these events. However, the pilot sample was too small to draw any conclusions beyond the usability of our method.

5. Conclusion

We plan to start the final experiment on the evaluation of the ability of the historical computer games to affect the players' implicit and explicit attitudes towards the historical topics represented in the game in September 2017 (planned $N \sim 150$). We will preserve our standard of organization verified by the pilot study. The study will use between-subject design, as planned. We will also use the same modified game "Czechoslovakia 38-89: Borderlands." Furthermore, we will finish our work on development of a new identical version of "Czechoslovakia 38-89: Borderlands" referring to Spanish Civil War in 1936-1939, which will be used as the second research tool for identification of possible in-group bias. Our data will be collected also one month after the intervention to identify long-term effects on attitude change. The study has the potential to clarify the effects of historical computer games on attitudes of players towards the represented historical topics. In a broader perspective, our research aims mainly to deepen the understanding of formation of historical awareness in the 21st century.

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