



Elderly people and morality in virtual worlds: A cross-cultural analysis of elderly people's morality in interactive media

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Leyla Dogruel

Free University Berlin, Germany

Sven Joeckel

University of Erfurt, Germany

Nicholas D. Bowman

West Virginia University, USA

Abstract

This study examines elderly people's innate moral foundations in influencing decisions, and their subsequent enjoyment in an interactive media environment. The Moral Foundation Questionnaire was used to distinguish between the moral intuitions of elderly US and German respondents, who were believed to have divergent yet stable moral codes that would be salient in a novel virtual world. In an experimental design, participants (N=116) were confronted with a computer simulation in which they could decide to violate or uphold each of five moral intuitions. Germans and Americans differed in their moral foundations, yet for both groups higher moral salience led to a decrease in decisions to commit moral violations in a virtual world. Results for enjoyment were mixed.

Keywords

Digital immigrants, enjoyment, moral foundations theory, morality, virtual worlds

Corresponding author:

Leyla Dogruel, Free University Berlin, Garystr. 55, Berlin 14195, Germany.

Email: leyla.dogruel@fu-berlin.de

While computer and internet use among elderly media users has increased over the last decade, these users can still be understood using Prensky's (2001) notion of digital immigrants. By this, Prensky is referring to individuals who may use digital media now, but did not grow up using it; this is in contrast to digital natives, or individuals who have incorporated digital media into their lives from a very young age. Moreover, while digital immigrants may have learned to adapt to the new digital environment, they 'always retain, to some degree, their [real-world] "accent"' (Prensky, 2001: 2). In particular, their usage of and experience with virtual worlds is limited.

Based on Prensky's concept of digital immigration and evidence from relevant migration literature (Feather, 1979; Vauclair, 2009), we assume that elderly media users make decisions in virtual worlds based on their real-life beliefs. Approaches in entertainment theory suggest that moral considerations play a crucial role for media enjoyment (Zillmann, 2000; Zillmann and Cantor, 1976), and studies using interactive media provide us with a perspective on the relationship between morality and enjoyment. On the one hand, players of violent video games have been found to morally disengage from content when confronted with moral violations such as killing virtual characters (Klimmt et al., 2006). On the other hand, people's highly empathic enjoyment of video games is reduced when players are forced to act against their moral code (Hartmann and Vorderer, 2010). For elderly media users not familiar with virtual worlds, we would expect that moral disengagement strategies are not as established, and as a result that they would rely more on real-life value systems. Thus we expect that when confronted with moral dilemmas in virtual worlds, digital immigrants will both (a) base their decisions on moral orientations from real life and (b) enjoy the experience more when characters in the virtual environment behave according to the individual's intuitive real life moral orientation. These predictions are based on Moral Foundations Theory (MFT; Haidt and Joseph, 2007), an intuitionist's perspective on morality that has been applied to understanding the relationship between morality and media consumption and enjoyment (Tamborini, 2011). The hypotheses are tested in an experimental setting, where the participants – elderly computer users ($n_{\text{Germany}}=54$, $n_{\text{USA}}=62$) – were confronted with morally challenging scenarios in an interactive and entertaining virtual environment developed by the research team.

Digital immigration

At first, Prensky's concept of the digital immigrant might seem to be a felicitous metaphor. Yet integrating concepts from migration studies to the appropriation of technology may help us to understand how elderly people react to morally challenging content in interactive media. Recent approaches in migration studies accentuate the notion that migration is not a one-way process of assimilation, but rather a complex process consisting of different acculturation strategies (Levitt and Jaworsky, 2007; Nauck, 2008). This is paralleled in findings from research and theory on the appropriation of media and technology literature (such as social shaping/construction of technology, domestication theory and the social construction of technology), which stresses a similar social negotiation process (Quandt and von Pape, 2010). We argue that when elderly people are confronted with morally challenging situations in a virtual world, they might indeed

experience a similar situation that migration literature describes when migrants are confronted with a new and unfamiliar culture (Feather, 1979) – a situation causing feelings of disorientation and a reliance on the values and norms known to them from their host culture (Esser, 1980: 71). This is particularly relevant for elderly people with established sets of norms and values (Feather, 1979).

When people migrate into any environment, they face the challenge of having to cope with cultural differences. As shared values are a core aspect of culture, migrants are confronted with adjusting their value system to that of the culture they are migrating to (Vauclair, 2009). There is at least minimal consensus that culture can be seen as a collective phenomenon shared by its members (Hofstede, 2001; Schwartz, 2006), or a 'collective programming of the mind' (Hofstede, 2001: 9). Such reasoning implies that elderly people, unfamiliar with novel virtual worlds, have conceptually similar experiences to migrants entering a new country.

Moral development and the elderly

The majority of research on moral development focuses on children, particularly adolescents and young adults, as moral systems are developed during adolescence (Malti et al., 2007). However, age-related differences have been reported in research on morality, for instance between teenagers and the elderly (50–65 and 65+) with respect to moral reasoning (McDonald and Stuart-Hamilton, 1996). Using Shweder et al.'s (1997) considerations of the three ethics of autonomy, community and divinity, Haidt et al. (1993) demonstrated that young Americans relied on the ethics of autonomy far more than those of community and divinity. These results were collaborated by Jensen (1995), who found that young adults (19–27 years) focused primarily on autonomy, while midlife (35–56 years) and older adults (65–84 years) focused on each of the three ethical bases in roughly equal proportions. These findings suggest that age-related differences in moral orientations can be found across the lifespan.

While moral orientations differ across younger and older age groups, differences within older age groups are marginal. Jensen (1997) expanded his analysis of the three age groups (young, midlife, older adults) to investigate how far the 'culture war' between American progressive liberals and orthodox conservatives shaped by different moral perspectives (Hunter, 1991) remains stable across the lifespan. Jensen hypothesized that with age comes a decreased reliance on autonomy and an increased reliance on community for both cultures; no change in the reliance on divinity was predicted. The results found that indeed progressives reasoned more in terms of autonomy when confronted with moral issues, while orthodox participants reasoned more in terms of divinity. Importantly, these differences were found across all age groups employed in the study. In other words, adherence to a culture of orthodoxy or progressivism was a better predictor of changes in moral focus than age was, as the distinction between orthodox and progressivist moral evaluations occurred across the adult lifespan.

These findings illustrate that moral orientations remain fairly stable across the adult lifespan and are consolidated through lifelong experiences. In particular, elderly citizens are people with strong and stable moral orientations across Shweder et al.'s (1997)

concept of the three ethics. Recently, the three ethics have been developed into a broader, intuitionist model of morality – Moral Foundations Theory or MFT.

Moral foundations theory

MFT is a social psychological approach to morality. Based on well-discussed shortcomings of existing concepts of individual morality – namely the predominance of rationalistic approaches to morality (Kohlberg, 1969) and the conceptually restrictive nature of past theorizing to explain moral judgments (e.g. a result of fairness and harm: Turiel, 1983) – Haidt (2001) developed MFT based on a broader intuitionist approach to moral judgments (Graham et al., 2009), which incorporates several dimensions of moral foundation as well as explaining the fact that often moral dumbfounding occurs that cannot be accounted for in rationalist concepts of morality. First, MFT presents five universal domains, or modules, based on anthropological and developmental psychology research that these moral intuitions fall into: harm/care, which is concerned with the suffering of others and empathy; fairness/reciprocity, which is related to reciprocity and justice; in-group/loyalty, which deals with the common good and punishment of outsiders; authority/respect, which concerns the negotiation of rank in the social hierarchies; and purity/sanctity, which is concerned with a pure, *clean* way of life (cf. Haidt and Graham, 2007; Haidt and Joseph, 2007 for a detailed discussion of the roots of each foundation). These five modules are innate and are thought to represent a *first draft* of morality in our brains before we are sensitized by experiences during our socialization. Second, MFT specifies the notion of moral dumbfounding as a more logical explanation for the types of morally based reactions that individuals often have. Moral dumbfounding occurs when people have an immediate intuitive *good or bad* reaction to a behavior that cannot be justified rationally. Moral intuitions are described as ‘the sudden conscious appearance of a moral judgment, including an affective valence (good–bad, like–dislike) without any conscious awareness of having gone through steps of weighing evidence’ (Haidt, 2001: 818). Highlighting these aspects of moral judgments, Haidt and his colleagues derive their moral theory as a dual-process one that accounts for the immediate intuitive reaction as well as a subsequent cognitive, rational processing. Haidt formulates the relationship between intuitive and cognitive–rational (moral reasoning) as ‘intuitive primacy but not dictatorship’ (Haidt and Kesebir, 2010: 801). Importantly for the present study, MFT argues that the presence of moral modules is universal across cultures, while the salience of each varies between cultures: that is, module salience is ‘edited by (cultural) experience’ (Haidt and Joseph, 2007: 377).

A cross-cultural perspective on morality

Applications of MFT tend to focus on political contexts in the US as a ‘war of culture’ (Hunter, 1991) by identifying differences in moral orientations between political subgroups (cf. Graham et al., 2009). However, while MFT is designed to address a variety of cultural differences in moral orientations, no known work has tested MFT-based moral differences at the national level. While not a primary focus of the study, examining cultures with different moral orientations allows for a more complete test of the role of

morality in observed interactions in virtual environments; using elderly populations from two cultures allows for the examination of two distinct cultures with similar inexperience with technology.

Broadly, national moral orientation can be split up in terms of individualistic vs. collectivistic cultures (Shweder, 1993), which MFT would explain as a function of divergent moral salience patterns. For example, while protecting the independence of the individual as well as equality and justice are dominant values in individualistic cultures; collectivist cultures have a more interdependent duty-based morality (Wainryb, 2006). In this regard, both the US and Germany are considered Western and therefore rather individualistic cultures. Yet the two cultures still exhibit differences on more specific dimensions. Hofstede (2001) analyzed discrete value systems in 50 countries, and found the US and Germany to differ substantially on dimensions such as individualism (US: rank 1, Germany: rank 11) or uncertainty avoidance (Germany: 29, US: 44). Religiosity is another morally based dimension (Graham and Haidt, 2010) where Germans and Americans differ substantially, with 47 percent of Americans marking religion as 'very important' compared to 11 percent of Germans (Voigt, 2007; World Value Survey, 2005).

MFT and entertainment theory

The usefulness of MFT in understanding the connection between media and morality has been recognized particularly in understanding entertainment media. Tamborini et al. (2009) found moral module salience to predict perceived character morality and resulting narrative appeal. Eden and Tamborini (2010) underscored the role of morality subcultures (groups of individuals with shared moral salience patterns, similar to our cultural distinctions between Americans and Germans) in the formation of character dispositions central to the enjoyment process, Zillmann and Cantor (1976), suggesting that moral modules are capable of explaining how, when and why people would respond to the same content with different judgments. While these processes have been found to impact enjoyment, they have also been found to cyclically affect moral salience after repeated exposure, similar to the cultural reinforcement of moral intuitions at the national level. Tamborini (2011) synthesized these findings into a larger model of intuitive morality and exemplification (MIME) that specifies the role of moral module salience in both the short-term enjoyment reactions to entertainment media and the long-term effect on moral salience stemming from repeated exposure.

Hypotheses and research questions

The research model used in this study combines findings from cross-cultural research on morality with results from entertainment and morality research. We apply these findings to interactive media to investigate the possibility that the moral module saliences of elderly people predict responses to a series of morally charged situations in a novel virtual environment.

Research on entertainment and morality suggests that different morality subcultures respond differently to entertainment media. Up to now, these moral subcultures were derived from populations within one nationality. Our study explains this by using MFT

to analyze variance in morality at the national level. Thus we expect that national culture at least partially explains different salencies in moral modules, and analyzing elderly people from two different cultural backgrounds provides us with the opportunity to analyze separate moral orientations.

The focus of our study is the role of moral orientation in understanding behaviors in and reactions to a novel virtual environment. Based on findings from research on migration, we assume that for digital immigrants real-life moral orientations act as guidelines in virtual worlds as well. A crucial distinction between interactive and non-interactive media is the level of agency the user has over on-screen action. Whereas in non-interactive media users can only witness action, interactive media place users in control of the action. Moreover, as salient moral modules act as guidelines for actions, particularly for digital immigrants, it can be expected that if a moral module's salience is high, it is more likely that a media user will uphold this moral module and will not choose to violate it. Furthermore, we expect this general process to be stable across cultures. Although we expect to find differences in moral module salience between both cultures at the aggregate level, the prediction should be the same for both cultures: if a moral module is salient, the probability of a violation being committed should be reduced.

H1: If a moral module is salient, elderly people are more likely to choose not to violate it when confronted with a potential violation in a virtual, interactive environment.

In addition, as previous research on media and morality has explicated the role of moral salience on enjoyment (Eden et al., 2010), we also focus on this relationship. We assume that elderly people with a stable set of moral orientations will not want to be confronted with open violations of their salient moral modules. Previous research has already indicated that enjoyment should suffer if people are forced to act against their moral orientation (Hartmann and Vorderer, 2010). For elderly users, not familiar with virtual worlds, we expect this process to be stronger than potential moral management strategies (Klimmt et al., 2006). Thus we expect enjoyment of the mediated experience to suffer when salient moral modules are violated.

H2: If elderly people are confronted with a potential violation in a salient moral module that they would like to prevent, enjoyment will suffer when the violation still occurs.

Method

Participants were recruited through adult education centers in both Germany and the US, with $n=54$ German participants ($M_{\text{age}}=66.54$, $SD=6.97$, 57 percent female) and $n=62$ US participants ($M_{\text{age}}=68.02$, $SD=11.69$, 71 percent female). As part of the cover story for the study, participants were informed that they would be evaluating a computer simulation still in development. The experiment took place in computer labs. Groups of participants were randomly distributed to two treatment conditions (intervention vs. no intervention), and asked to play the simulation and to interact with virtual, non-player

characters (NPC) (for all NPC episodes, see Bowman et al., 2011, supplemental file). Each session started with the participants choosing a male or female avatar and the researchers carrying out a tutorial with the participants to explain the simulation's controls and the administration of study questionnaires. Research assistants were present to help participants with the simulation and the questionnaires, as well as to ensure that all study materials were administered properly. Following a short tutorial session, participants played the simulation at their own pace (an average of 30 minutes); during game-play participants responded to their impressions of the different game interactions. After the simulation ended, participants were given a questionnaire with items measuring the overall gaming experience, moral foundations and socio-demographics.

Six short written scenarios adapted from existing MFT literature in entertainment (Haidt and Joseph, 2007) were pilot-tested in two independent samples of German (n=328) and US (n=149) undergraduate students. Each scenario was around 550 characters long and contained one main male character violating one of the five moral modules. A sixth story with no violation of any moral module was used as a control condition. Based on the pre-test, all stories violated the intended moral module while not affecting the other modules (for a detailed description of the materials and pre-test study please refer to Bowman et al., 2011, supplemental file). These scenarios were then transferred into a virtual world environment, using the AURORA® toolset of the computer game *Neverwinter Nights*. The toolset allowed us to generating a medieval-style virtual environment comparable to popular role-playing games such as *World of Warcraft* and *Runescape*. All game characters – both player avatars (one male and one female character with generic names, e.g. John Doe or Max Mustermann) and NPCs – were generic human characters from the game's character library.

In the virtual environment, participants were told to visit six former students of a professor in order to gather up photo albums for a party in the professor's honor. The six students represented the NPC episodes referenced above, one for each moral scenario and a control scenario. For each NPC, a dialogue was developed using the six pre-tested stories as a foundation. NPCs were presented in-game with an environment and appearance that would fit their stories. For example, as the story of one NPC took place in a bar (harm/care), the NPC was positioned with the relevant interior (e.g. tables, stools). At the end of each dialogue, participants could instruct the NPC either to violate a moral module by telling the character to behave as described in the pre-tested scenarios or they could choose to tell the NPC not to violate the relevant moral module. In the intervention condition (IC), the NPC declared that he would act as indicated by the player. In the no-intervention condition (NIC), the NPC always declared that he would commit a violation regardless of the player's suggestion. Participants were unaware of which condition they were confronted with. Participants' conversations and instructions to the NPC were logged using the game's automatic inventory function; participants were not made aware of the inventory system during gameplay.

Measures

Moral evaluation survey

The Moral Foundations Questionnaire (MFQ: Graham et al., 2009) was used to evaluate moral module salience. The original English-language version of the MFQ consists of 32

items, including six items measuring module salience and two foil items. Small adjustments had to be made for the German-language application to account for language specifics, and one item for the purity/sanctity module related to chastity had to be removed because of inapplicable wording in German. Internal consistency of the subscales using Cronbach's alpha (α) was: Germany harm/care ($\alpha=.564$, $n=50$, six items); fairness/reciprocity ($\alpha=.696$, $n=50$, six items), in-group/loyalty ($\alpha=.590$, $n=52$, six items); authority/respect ($\alpha=.720$, $n=46$, six items); purity/sanctity ($\alpha=.647$, $n=50$, five items). US harm/care ($\alpha=.545$, $n=61$, six items); fairness/reciprocity ($\alpha=.638$, $n=61$, six items), in-group/loyalty ($\alpha=.722$, $n=62$, six items); authority/respect ($\alpha=.594$, $n=61$, six items); purity/sanctity ($\alpha=.817$, $n=61$, six items). Notably, some scale dimensions had alpha scores slightly lower than the often proposed cutoff scores of .6 (cf. Schmitt, 1996). Yet when analyzing internal consistency measures, we must attend to three crucial aspects, including sample size, the broadness of the construct and the number of scale items. Rammstedt (2010) cautions against rejecting scales as invalid merely on the grounds that their internal consistency scores are low, and instead argues that researchers must consider how scale items measure the construct *prima facie*, as well as the costs associated with sacrificing theoretically relevant items in favor of increasing internal validity statistically. Similarly, Schmitt (1996: 353) argues that 'when a measure has other desirable properties, such as meaningful content coverage of some domain and reasonable unidimensionality, this low reliability may not be a major impediment to its use'. We further note past research applying MFQ to understanding moral domain saliences (cf. Eden et al., 2010; Graham et al., 2009; Tamborini et al., 2009) that has successfully implemented the MFQ with comparable reported alpha levels while justifying the lower scores as indicative of the broad nature of morality. Thus, while we acknowledge that more work is needed to refine the measurement of moral intuitions, we chose to retain the original scale and its items in order to better compare our findings with extant literature.

Moral decision

Participants' responses to NPCs were logged using the game's discrete inventory function, resulting in a dichotomous measure for violating (= 1) or not violating (= 0) each.

Enjoyment

An abbreviated version of a video game enjoyment scale used by Klimmt (2005) was used to measure enjoyment. Using a preexisting dataset of 64 undergraduate students, unidimensionality of the scale was tested and marker items were identified, resulting in a seven-item scale. Reliability of the scale was good (Germany: $\alpha=.910$, $n=49$; US: $\alpha=.912$, $n=61$).

Control measures

Experiences in interactive media can be affected by a considerable range of variables (Klimmt, 2005). In order not to fall into the trap whereby increasing the number of control variables means that we find effects only because we increased the number

of variables in our model, we limited our focus to certain crucial variables. Thus we controlled for age, gender, gaming experiences with computer games (one-item measure) and feelings of presence (a generalized one-item measure from the German IPQ Presence Scale; Schubert et al., 2001). For elderly computer users, technophobia – negative psychological reaction toward technology – is particularly salient (Rosen and Maguire, 1990). Technophobia was controlled for using a scale available in German and English (Sinkovics et al., 2002) measuring three dimensions: personal failure (six items: Germany: $\alpha=.870$, $n=52$ /US: $\alpha=.851$, $n=60$), human–machine ambiguity (four items: Germany: $\alpha=.784$, $n=54$ /US: $\alpha=.811$, $n=61$), and convenience (three items: Germany: $\alpha=.734$, $n=54$ /US: $\alpha=.858$, $n=61$).

Results

Randomization check

Participants were randomly assigned to treatment conditions (intervention vs. no intervention). As this manipulation was designed to test variance in enjoyment, we tested to ensure that the manipulation did not have an effect on moral module salience or on the decision to violate or not a moral module. As – in contrast to significance testing for differences – tests for equivalence are complex, we followed the logic of significance testing for differences but we raised the critical test level, arguing that if we found no significant differences on this more liberal p -level, we could interpret our groups as not different in the relevant criteria. For an acceptable solution, we required the majority of differences not to be significant on the $p < .25$ critical test level with no difference being significant at the $p=.10$ level. For both measures, no differences at the $p=.10$ level were found. For the more conservative $p < .25$ level (that is, a 75 percent chance of a significant difference between measures), differences between the two conditions for US participants' moral salience for fairness/reciprocity ($p=.122$) and purity/sanctity ($p=.174$) were found; no mean difference was bigger than .4 scale points. For the decision to violate a moral module, only differences for harm/care and in-group/loyalty were significant on the raised $p < .25$ level for Germans (in-group/loyalty: $\chi^2=1.817$, $p=.178$; harm/care: $\chi^2=1.651$, $p=.199$). The randomization of participants to conditions was successful.

Cultural differences in moral module salience

The pattern of moral module salience differed significantly between US and German participants. Comparing the means of moral module salience yields significant differences between Germans and Americans for harm/care, fairness/reciprocity and authority/respect. Specifically, Germans showed higher salience for harm/care and fairness/reciprocity and lower scores for authority/respect (Table 1). These results suggest the MFT instrument to be a valid measure of cultural differences at the national level. In our study, elderly Germans focused more on harm/care and fairness/reciprocity, and elderly Americans reported a more even distribution of moral module salience across all five dimensions; these patterns are similar to anecdotal evidence of German culture being more liberal than American culture (cf. Graham et al., 2009).

Table 1. Moral foundation scores by nationality

	GERMANY M (SD)	US M (SD)	t	df	p
Harm	5.2 (.6) (n=50)	4.9 (.7) (n=60)	2.509	108	.014
Fairness	5.0 (.6) (n=50)	4.7 (.6) (n=61)	2.141	109	.035
Authority	3.7 (.9) (n=46)	4.5 (.8) (n=61)	-4.663	105	<.001
In-group	4.1 (.8) (n=52)	4.3 (.9) (n=62)	-1.690	112	.094
Purity	3.8 (1.0) (n=50)	4.0 (1.2) (n=61)	-1.146	109	.146

Table 2. Observed moral violations

	Violations (Total)	Violations (Germany)	Violations (US)
Harm	17% (n=114)	25% (n=52)	10% (n=62)
Fairness	7% (n=115)	9% (n=53)	5% (n=62)
Authority	52% (n=116)	72% (n=54)	34% (n=62)
In-group	55% (n=116)	67% (n=54)	45% (n=62)
Purity	47% (n=116)	65% (n=54)	32% (n=62)

Hypothesis 1: Morality and decisions in interactive media

H1 predicted that fewer violations would occur in salient moral modules. At the general level, the fewest number of violations occurred in the harm/care and fairness/reciprocity scenarios – both modules that had the highest average salience scores. This pattern was found for both nationalities (Table 2).

Looking at scenario-specific violation patterns between nationalities, there are striking differences between them. On average, Germans violated significantly more moral scenarios than Americans (with $M_{\text{German}}=2.4$, $SD=1.1$, $M_{\text{US}}=1.3$, $SD=1.0$, $t=5.586$, $df=114$, $p < .001$). This finding seems empirically plausible, as Germans showed on average lower salience scores in three out of the five moral modules. Still, they also violated more often the two scenarios which Germans reported as more salient than their American counterparts. On average, the difference between the highest (harm/care) and the lowest (purity/sanctity) moral module salience was less than one scale point for the Americans; this difference was close to 1.5 scale points for Germans. For Germans, the difference between the moral scenario that was least violated (fairness/reciprocity) and that was most violated (authority/respect) was 63 percentage points. For the US, the same difference (fairness/reciprocity to in-group/loyalty) was only 48 percentage points. Why these differences between the two groups occurred remains open for further discussion, but their existence suggests that Germans tended to make more no-go-type decisions regarding moral violations.

In order to test H1, we have to account for these different moral salience patterns. That being said, we are primarily interested in the general mechanism that if a moral module is salient, elderly people are more likely to choose not to violate it when confronted with a potential violation in a virtual, interactive environment. Therefore, we

focused on the general moral salience level and not on the level of individual moral modules. A salient module was defined as the module for which a participant had the highest salience score, and a non-salient module was a module for which a participant had the lowest score. While this approach does not allow us to examine specific modules, it is still important from a theoretical perspective, as MFT proposes that moral judgments in one module are dependent on moral salience in other modules (Haidt and Joseph, 2007). For H1 to be confirmed on this general level, two requirements must be met. First, the proportion of violations is significantly different between scenarios in modules that have the highest salience and that have the lowest salience for participants. Second, the proportion of violations for scenarios in modules that have the highest salience for the participants is lower than 50 percent and is significantly different from a random distribution: that is, if an individual is able to choose between two options, we expect to find a 50–50 (i.e., random) distribution in choices to violate or not, so long as there is no systematic mechanism leading to a divergence from this randomness. Additionally, it is assumed that this general pattern would be found across national cultures.

In modules with the highest salience, 16 percent of participants opted to violate the corresponding module in the simulation. This compares to 56 percent of participants violating the corresponding scenario in modules with the lowest salience. The difference between the proportions of violations is highly significant between the two groups ($t=-6.69$, $df=98$, $p < .001$), supporting our expected pattern. Thus, our first criterion for H1 was supported. The number of violations for the most salient module was also significantly different from a random distribution (binominal test against 50 percent, $p < .001$). The second criterion for testing H1 at the aggregate moral module level was supported as well.

Even though the number of violations was on average overall higher for Germans, the general pattern in support of H1 was found for both Germans and Americans. For Germans, the number of violations for both modules that are of highest and that are of lowest salience increased to 23 percent (highest salience) and 75 percent (lowest salience) but the difference remains significant ($t=-5.875$, $df=43$, $p < .001$) (criterion 1). Additionally, the number of violations for the highest salient modules was significantly different from a random distribution ($p < .001$) (criterion 2). For the American participants, 10 percent of violations occurred in modules whose salience was highest. For modules whose salience was lowest, violations were observed 40 percent of the time. Again, this difference is significant ($t=-3.807$, $df=54$, $p < .001$), and the number of violations for modules of highest salience was significantly different ($p < .001$) from a random distribution.

Even if Germans and Americans differed in the salience of moral modules and the number of violations for each of the moral scenarios, the overall pattern as proposed in H1 could be supported for both cases. If a moral module was salient, participants were more likely not to violate this module than if the module was not salient for them.

Hypothesis 2: Effects on enjoyment

H2 predicted that when digital immigrants are confronted with a potential violation in a salient moral module they would like to prevent it; enjoyment is supposed to suffer if the

violation cannot be prevented. Thus we expected that enjoyment would be lower for the no-intervention group than for the intervention group. As enjoyment was found to vary at the national level, this influence was examined in the analysis of H2. Additionally, we controlled for the number of violations a participant had willingly committed, along with the other control variables of age, gender, experience with virtual environment, presence and technophobia.

At the descriptive level, neither nationality nor experimental condition had an effect on overall enjoyment, thus rejecting H2 (Table 3). Instead, we see that the number of violations willingly committed had a significant influence on enjoyment, contributing the second-most explained variance ($\eta^2=.057$) behind presence ($\eta^2=.161$). The only other significant predictors of enjoyment were increased presence and prior experience with computer games, with the full model explaining just over one quarter of variance (adjusted $R^2=.286$). Interpreted, this data tells us that it is not so much the number of violations that people are confronted with, but the number of violations people willingly commit, that affects enjoyment.

Discussion

The aim of this study was to analyze elderly people's morally driven behavior in virtual worlds. It was expected that elderly people, understood as digital immigrants who did not grow up with interactive media and who therefore often lack experience with it, would rely on their real-life moral orientations to make decisions in virtual worlds. In

Table 3. ANCOVA – enjoyment by intervention manipulation and nationality

Descriptives	Germans		US		
No intervention	M=3.38 (SD=1.2)		M=3.67 (SD=.75)		
Intervention	M=3.61 (SD=.84)		M=3.73 (SD=.98)		
	df	f	sig.	reg.B	η^2
Model	11	4.603	<.001		.365
Constant	1	7.977	.002		.083
Age	1	.004	.947	-.001	<.001
Gender	1	.579	.449	-.138	.007
Presence	1	16.942	<.001	.310	.161
Experience computer games	1	4.296	.041	.165	.047
Technophobia: personal failure	1	2.090	.152	-.163	.023
Technophobia: human machine	1	1.358	.256	-.100	.015
Technophobia: convenience	1	.059	.808	-.021	.001
Number of violations committed	1	3.479	.023	.201	.057
Nationality	1	.595	.442	-.118	.007
Condition	1	.267	.607	-.083	.003
Nationality × Condition	1	.061	.805		.001
Error	88				

order to scrutinize different patterns of morality, we examined morality in elderly people in different national cultures, Germany and the US. Summing up our findings, three main concepts emerge: (a) the usefulness of MFT for intercultural comparisons; (b) the application of MFT as an explanatory factor for moral decisions by elderly people in virtual worlds; and (c) the effects of real-life moral orientations on enjoyment of these virtual worlds.

Regarding (a), we applied MFT to understand and compare moral differences between elderly people in Germany and the US. Our findings indicated that German and US participants differed significantly in the salience of moral modules. We argue that these observed differences provide us with evidence with which to view both as distinct morality subcultures, a necessary precondition for the primary focus of our paper.

The central perspective of our research from a media scholar standpoint was to (b) explore the potential for moral orientation to serve as an explanatory factor for decisions in interactive media environments. We hypothesized that – in a way that was comparable to migrating to a new country – elderly people would use their already established moral orientations to guide their behavior when they were confronted with moral scenarios in the new digital culture. In general, our findings confirmed that established, real-world moral module salience leads to fewer observed violations in scenarios corresponding to those relevant modules. Moreover, while this mechanism remained stable across both cultures, we were confronted with findings that we do not yet have an explanation for. For instance, German respondents significantly violated more scenarios in our simulation, and a theoretical explanation is still open. Work on the adoption and appropriation of technology suggests that research should account for variables such as attitudes toward, and previous experiences with, technology (Czaja and Lee, 2007). However, as we were only able to control for technophobia and experience with computer games in our study, it is possibly that our German and US participants could have differed in other related variables.

Finally, based on previous research on morality and entertainment, we expected (c) that when elderly people were confronted with moral transgressions in interactive media that occurred in salient moral modules which they could not prevent, enjoyment would suffer. We could not confirm the prediction that moral transgressions would reduce enjoyment, although one striking finding was the effect on enjoyment of the number of violations that people had willingly committed. Still, we have to critically discuss the implication of this finding. Analyzing this effect more carefully, we should account for the fact that we cannot directly make a claim on its causal directions. We proposed that the number of violations committed should impact on enjoyment, expecting that more violations being confronted should reduce enjoyment. Not only could we not find this proposed effect with our stimulus manipulation, but the effect of the number of willingly committed violations runs contrary to our assumptions. If we correlate the number of violations with enjoyment ($r=.189$, $p=.049$, $n=110$), the correlation is positive, meaning that the more violations one chooses to commit, the more enjoyable the game. This relationship becomes even more accentuated if we control for nationality and condition ($r=.270$, $p=.005$, $n=106$). One potential alternative explanation for this finding is the notion of moral disengagement (Bandura, 1999). Looking into findings of moral disengagement in video games (cf. Hartmann and Vorderer, 2010), it has been suggested that in order to

maximize enjoyment from morally questionable media content, users actively refrain from their real-life moral attitudes. This moral disengagement hypothesis might actually explain the small yet significant correlation between observed violations and enjoyment. Although our support for H1 seems to run contrary to this, future research should examine both the potential for moral disengagement strategies to influence observed decision-making, and the potential mediating effect of enjoyment on this process. At the same time, recent theorizing (Raney, 2010) has been critical of moral disengagement, arguing instead that audiences develop narrative- or media-specific moral lenses with which to process entertainment media in context, separately from the real world. While on the surface this argument suggests a similar alternative explanation as provided by the moral disengagement hypothesis, we argue that a central tenet of Raney's notion would be the experience necessary to develop the media-specific moral lens. For the elderly participants in our study, it is unlikely that they were able to develop a lens for video game play both in general and within the context of the narrative, which might be expected to be vastly different from their own media and narrative experiences. This domain would be a worthwhile extension of our research.

As for now, our findings indicate that the relationship between moral module salience and moral decisions is perhaps more straightforward than for the effects these decisions will have on enjoyment, particularly for an age group thought to rely on their real-life moral orientations when immigrating to the new digital world.

Limitations and future research directions

The exploratory nature of our paper points up several limitations in the study. First, we note that the scales employed for measuring moral modules suffered from low internal consistency scores that were most likely due to the nature of measuring a broad construct such as morality with a scale consisting of a limited number of items. Yet the measure still has predictive validity and provides for a parsimonious metric for use in assessing such a complex construct as individual moral orientations across different cultures.

Second, the stimulus materials were all pre-tested using a college-aged population, so we cannot be sure if the elderly population interpreted and responded to these materials similarly. In addition, the research material had to be translated from German to English and back again. Even if this was accounted for by multiple retranslations performed and checked using a bilingual research team with native German and English speakers, there still might be problems with the stimulus materials, particularly as the development of morally charged material is not without challenge. Using more scenarios of the same module could improve this situation, as it would allow us to test the stability of the expected manipulation.

As a third limitation, many studies in the field of interactive media have focused on adolescent, student or other younger populations. Because of this, there are few guidelines for doing such research with elderly people. Methodologically, we might assume that elderly people had more problems when taking part in our study than younger people. Elderly users tend to require more support when using the interactive stimulus material. This population is also often sensitive to the nature of the research in general. In our study, some participants raised questions about data privacy and usage that are

not often expressed by younger populations. This may have led to feelings of reactance when asked to provide personal opinions about the game, an issue we addressed by employing trained research assistants who supported our participants when needed. We also provided detailed consent and debriefing forms and further worked to foster trust between the research team and our participants by collaborating with adult education course managers, both in the US and Germany, who acted as intermediaries.

As a fourth limitation, we are missing the comparison with younger people. We assumed that elderly people, due to their experience in life and lack of experience with interactive media, would more strongly rely on real-life moral orientation compared to young people. For a follow-up study, this comparison should be the focus of interest. This limitation is particularly relevant as elderly people are usually not the typical user segment of interactive media. However, we might argue that moral concerns with respect to interactive media such as video games might be one reason why more mature audiences refrain from using such entertainment (Schmierbach et al., 2011). As we are interested in analyzing the mechanism between real-world moral orientation and behavior in digital media, it is logical to focus on a group of people that has established real-world beliefs but lack experience in digital media.

A final limitation concerns the selection of countries for our study. We wonder whether choosing cultures with stronger distinctions might have led to stronger differences in the salience of moral modules. For example, it seems plausible that moral reactions to the in-group/loyalty scenario would be stronger in a more collectivistic culture such as China or Japan. However, we note that the mechanisms by which a real-world moral orientation impacts on decisions in virtual worlds should be the same for all cultures.

Conclusion

Our study was focused at examining the influence of moral foundations on decisions in virtual worlds, specifically with an elderly population of users considered to be digital immigrants who can be expected to rely on their 'real-world' sense of morality when entering novel, virtual space. We assessed moral foundations using MFQ, finding that elderly people from two different national cultures (the US and Germany) differed significantly in their moral orientations. More central to the current study, moral salience was found to be significantly associated with decision-making, with increased moral salience inhibiting decisions to violate salient aspects of morality for both populations. Effects on enjoyment were less clear, but trended in the direction that committing moral transgressions was associated with slightly higher levels of enjoyment.

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Leyla Dogruel is a Research Associate at Freie Universität Berlin. Her research interests are media innovation research, and elderly media users.

Sven Joeckel is an Assistant Professor for Communication/Digital Media at the University of Erfurt. His research interests are the use and economy of digital media, particularly video games, and empirical research on adolescents' media use.

Nicholas D. Bowman is an Assistant Professor for Communication at West Virginia University. His research interests are in the areas of media psychology and entertainment theory, with a particular focus on interactive technologies such as video games and social media.