

Understanding the Impact of In-Game Choices
on the Experience of Appreciation and
Real-Life Prosocial Behavior

Inaugural Dissertation

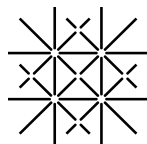
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by

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Abstract

An essential part of our daily life is the engagement with media such as games and their narratives. It stands to reason that many scholars therefore have become interested in the potential psychological effects that these interactive media have on their players. More recently, a growing body of research has dealt with the question whether and why games affect their players beyond entertaining them, such as positively impacting knowledge, attitude towards out-groups or prosocial behavior. More and more games, potentially effective in these serious matters, offer active participation with the represented prosocial message through interactivity. An arguably simple but promising way to make games interactive is the provision of choices, which has recently been shown to evoke appreciation (i.e., state of experiencing media, wherein its contents are deeply processed on a cognitive, emotional and perceptual level), potentially leading to a positive impact on real-life prosocial behavior.

Games, however, have not always been found to promote prosocial behavior, indicating inconsistent findings and hence unresolved variables that complicate a deeper understanding of the effects. Because games can widely vary in their interactivity and narrative, they can vary in how they affect players. This may be a reason why studies did not always find empirical support that games positively affect prosocial behavior. The focus of this dissertation is therefore on one specific form of interactivity: in-game choices being made voluntarily. These choices were manipulated in different ways in four experimental studies.

The first study (Manuscript 1) aimed to replicate the previous positive findings with a simple interactive narrative-rich game version, but also went deeper into exploring the psychological mechanisms behind the effect of choices on real-life prosocial behavior. Being able to choose, however, had neither an effect on appreciation nor on prosocial behavior. Hence, the study described in Manuscript 2 more closely investigated the experience of when choices are perceived as meaningful in narrative-rich games and whether this perception could lead to higher appreciation. This experiment revealed that choices are associated with meaningfulness when they are consequential, social and moral. These choice characteristics, implemented in a simple interactive narrative-rich game, were successful in evoking appreciation, especially if the narrative-rich game allowed to make a voluntary choice.

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While empirical studies could support that assigned prosocial game content (e.g., helping) can positively transfer to real-life prosocial behavior, less is known about this transfer to real life, if prosocial choices are made voluntarily in the context of video games having both violent and prosocial content. As many popular games contain a mix of prosocial and violent content, this is important to investigate. Furthermore, it is yet unclear how a reward for prosocial in-game behavior would change the transfer effects of games on real-life prosocial behavior. The goal of the studies in ‘Manuscript 3’, is therefore to investigate in more detail under what conditions an in-game voluntary prosocial choice could transfer to real-life prosocial behavior. The provision of reward indeed played a crucial role for this transfer effect, but also affected how players reasoned their in-game behavior.

In conclusion, the effect of in-game choices and their consequences on real-life prosocial behavior may also depend on how players perceive themselves immediately after the game choice, or on how they process game content in a more meaningful way. The findings showcased in this dissertation, though looking mostly at only a single choice, are furthering the understanding of psychological conditions under which real-life prosocial behavior can be affected through interactive in-game choices.

This cumulative dissertation is based on the following three manuscripts:

1. Steinemann, S. T., Iten, G. H., Opwis, K., Forde, S. F., Frasseck, L., & Mekler, E. D. (2017). Interactive Narratives Affecting Social Change. *Journal of Media Psychology*. doi: <https://doi.org/10.1027/1864-1105/a000211>
2. Iten, G. H., Steinemann, S. T., & Opwis, K. (in press). Choosing to Help Monsters: A Mixed-Method Examination of Meaningful Choices in Games. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*
3. Iten, G. H., Bopp, J. A., Steiner, C., Opwis, K., & Mekler, E. D. (submitted). Deciding to Help In-Game Increases Real-Life Prosocial Behavior – The Impact of Reward and Reasoning. [Manuscript submitted to *Computers in Human Behavior*]

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Introduction

Stories are a big part of humanity and accompany an individual's life from early childhood until old age. Nowadays, technology can allow such entertaining narrative content to become interactive, either as games or interactive narratives in text form. Offering choices in this kind of entertainment is a potential way to enhance the interactive media experience (Crawford, 2012). Games demanding tough choices are popular and have garnered attention in academic work (e.g., Ellithorpe, Cruz, Velez, Ewoldsen, & Bogert, 2015; Grizzard, Tamborini, Lewis, Wang, & Prabhu, 2014; Krebs, 2013; Rogers, Woolley, Sherrick, Bowman, & Oliver, 2017; Schulzke, 2014; Weaver & Lewis, 2012). For instance, in the game *Fallout 3*, players are confronted with decisions such as whether to harm game characters, and would sometimes kill characters to get points, but would also reflect whether it is better to kill one character to protect another vulnerable character (e.g., "I think the main reason why I killed the overseer is because he was beating his daughter", p. 97, Krcmar & Cingel, 2016).

It has been discussed that games have the power to involve players actively in prosocial concerns and can even be an option for learning and practicing prosocial interactions if they contain similar prosocial or moral content as in *Fallout 3* (Murphy & Zagal, 2011; Triberti, Villani, & Riva, 2015; Zagal, 2012). Interactive entertainment media with comparable content could therefore serve a purpose beyond fun, such as fostering deeper emotions and thoughts on the content (Bopp, Mekler, & Opwis, 2016; Elson, Breuer, Ivory, & Quandt, 2014; Green & Jenkins, 2014; Iacovides & Cox, 2015; Oliver et al., 2015). For instance, recent research has provided first empirical insights that games, focusing on socio-political issues in their message, can positively affect attitude (Jacobs, 2016; Ruggiero, 2015) or even prosocial behavior (Steinemann, Mekler, & Opwis, 2015). These games are called *serious games* as they primarily serve such serious purposes (Ratan & Ritterfeld, 2009). Furthermore, games containing prosocial goals, but not publically labeled or known as serious games, have also been found to promote prosocial behavior (Gentile et al., 2009; Greitemeyer & Mügge, 2014; Greitemeyer & Osswald, 2010; Greitemeyer, Traut-Mattausch, & Osswald, 2012).

Nonetheless, there are several issues related to this research field of games affecting prosociality. First, apart from the discovered mediator of appreciation onto prosocial behavior (Steinemann et al., 2015), research, investigating why or

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how games may positively affect real-life prosocial behavior from a psychological perspective, has been scarce and needs replication (Ruggiero, 2015) to further the understanding of the conditions under which games are effective to promote social change. Second, that prosocial goals or events in games lead to prosociality has recently been challenged (Breuer, Velez, Bowman, Wulf, & Bente, 2017; Tear & Nielsen, 2013; Teng, Nie, Liu, & Guo, 2018). Sometimes, players took their good in-game deeds as a license to do bad deeds in the subsequent situation (Ellithorpe, Cruz, et al., 2015; Joeckel & Dogruel, 2016). Tear and Nielsen (2013) discussed that a possible reason why these games were not always effective in influencing prosocial behavior, is that the game may not have been perceived as prosocial, indicating that research first needs to examine how players process the in-game prosocial events and their consequences. One potential consequence to a prosocial in-game event is the provision of a reward, that has only been shown to affect prosociality outside games research (Zuckerman, Iazzaro, & Waldgeir, 1979). A potential way to address these issues is to more closely look at the content being presented, such as choices players can make. A major focus of this dissertation was therefore under what conditions in-game choices can affect people and what psychological processes are related to this effect.

This thesis aims to answer three general research questions which address the above outlined issues:

1. Can we replicate the effect of choices onto appreciation and prosocial behavior while investigating the psychological mechanisms responsible for the effect?
2. What choice characteristics are responsible for the experience of appreciation?
3. What is the role of reward in predicting real-life prosocial behavior after play?

To answer Question 1, we tried to replicate recent research on the potential positive effects of games and interactive narratives onto real-life prosocial behavior (Steinemann et al., 2015) and, based on the theoretical model of Green and Jenkins (2014), investigated further psychological processes possibly involved when choices in an interactive media context are made (Manuscript 1). This may help to explain why interactivity, here defined as making choices, could or could not transfer to real-life prosocial behavior. While the study of ‘Manuscript 1’ did not support the effect of interactivity as choices being made, Question 2 addresses the potential explanation

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that the proposed choices were not experienced as meaningful enough to lead to an effect of interactivity on prosocial behavior. A possible solution is therefore to investigate the given choice characteristics which might have made the game more meaningful to the players. In the study of ‘Manuscript 2’, consequences were found to be experienced as meaningful. So far, these consequences must also be morally or socially relevant so as to lead to higher appreciation, which has been empirically associated with prosocial behavior change for the better (Small & Simonsohn, 2007; Steinemann et al., 2015). For Question 3, we focused on understanding what would happen if a reward was provided as a consequence of an in-game decision to help (Manuscript 3). Reward was manipulated because it has only been shown to be empirically associated with prosocial behavior outside of games research (Zuckerman et al., 1979), but not in games research and when looking at subsequent prosocial behavior.

This thesis is structured as follows: The first section presents a theoretical background that introduces the topic and provides a review of previous research on games, prosocial behavior and positive effects that games can have on players. The second section introduces and summarizes each of the three manuscripts, including a review of current research pertinent to each. The third and final section of this thesis provides a general discussion of the research presented across the three manuscripts, including a discussion of how they relate to the overarching research objectives of this thesis. The value of this new knowledge and how it contributes to an improved understanding of in-game choices and real-life prosocial behavior are then discussed, ending with advice for future research.

Games Affecting Social Change

A large body of research has focused on assumed negative impacts that media consumption could have upon society, such as the theoretical discussion on the negative effects concerning anti- and prosociality on society (Joeckel & Dogruel, 2016) and the comprehensive research and discussions on how especially video games affect subsequent aggressive emotion and behavior (e.g., Anderson et al., 2010). Meta-analytical studies both support (Greitemeyer & Mügge, 2014) and contradict the negative effects of games on anti- and prosocial behavior (Ferguson, 2015). Moreover, methodological issues of the studies supporting negative effects have been addressed, possibly explaining the null findings of other studies (Elson, Breuer, Van Looy, Kneer, & Quandt, 2015; Tear & Nielsen, 2014), underlining that there are widely inconsistent findings and an intensive debate (Elson & Ferguson, 2014).

As a consequence, researchers have increased their focus on the potential positive influences of games. For instance, players have been found to behave more cooperatively after playing a game requiring cooperation with other players (Ewoldsen et al., 2012; Velez, Mahood, Ewoldsen, & Moyer-Gusé, 2014). Several scholars have furthermore become interested in the effects of serious games, which are games specifically created to promote beneficial outcomes such as learning, health or social change (Ratan & Ritterfeld, 2009). Research focusing on the effectiveness of games for social change provide empirical support that games can improve attitudes towards others (Gerling, Miller, Mandryk, Birk, & Smeddinck, 2014; Jacobs, 2016; Ruggiero, 2015), willingness to help (Peng, Lee, & Heeter, 2010) and prosocial behavior (Steinemann et al., 2015). An important and central question is how the content of these serious games has to be implemented in order to effectively communicate their message of promoting social change (Klimmt, 2009).

Currently, the effectiveness of such serious games has been supported in various ways. For instance, Kampf and Stolero (2015) have shown that the game *PeaceMaker* improved knowledge of the Israeli-Palestinian conflict. Besides improving knowledge around this conflict, if players were able to resolve the conflict in the game (i.e., the goal of *PeaceMaker*), they were not only more likely to improve their knowledge but also improve their attitude towards the less favored out-group of this particular conflict (Cuhadar & Kampf, 2014). Kampf and Stolero (2015) argued that the game may have been effective in improving knowledge and attitude towards the out-group for two reasons. First, *PeaceMaker* provides opportunities to be more

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active in participating and engaging with the content of this conflict, which should improve knowledge of its history and with this knowledge the attitude. It has been discussed that knowledge gaps on the circumstances of others may be responsible for the attitudes towards them, and improvement in knowledge related to these gaps was observed along an improvement of the previous attitude (Zahn et al., 2014). Hence, games improving knowledge on the circumstances might also improve attitudes. Second, taking the perspective of the less favored group has helped in improving knowledge and attitude towards this group (Kampf & Stolero, 2015). If such a game is played through the perspective of the out-group, it may have more power to elicit identification compared to only reading a text version of the same information (Bogost, 2007; Peng et al., 2010).

To apply the two mechanisms of participation and identification, games for change try to promote social change by presenting serious social issues of vulnerable people. Good examples include representations of refugees in *Darfur is Dying*, homeless people in *Spent*, or children forced to work in *My Cotton Picking Life*. In these games, players more actively experience the struggles that the characters in need go through compared to non-interactive media with the same content, which potentially increases their effectivity (Green & Jenkins, 2014; Ruggiero, 2015; Steinemann et al., 2015). For instance, if the game *Spent* (game about how poverty can quickly spiral into homelessness) was played, attitude towards homeless people improved, when compared to participants who only read a text or did nothing between the attitude ratings (Ruggiero, 2015). Similarly, in the game *My Cotton Picking Life*, the player is placed in the role of an Uzbekistani child and is made to pick 50 kilograms of cotton per day. Picking one cotton piece only adds about 1 gram to the bag, so the player would have to spend a minimum of 5 hours of clicking to get enough kilograms. A recent study found that playing *My Cotton Picking Life* for 70 seconds (on average) before quitting, already significantly changed players' attitudes towards the workloads these children experience (Jacobs, 2016). A specific characteristic for such serious games is that players make decisions as a game character, that can align their goals with the goals of this character (Jacobs, 2017). In this sense, a player can adopt the perspective of people in need and may be persuaded to feel empathy for them (Jacobs, 2017; Steinemann et al., 2015).

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Interactivity - Choices as a Potential Aspect Affecting Users in their Prosocial Attitude and Behavior

Within the context of serious games Klimmt (2009) argues that interactivity is a very crucial attribute which has the potential to affect social change (e.g., attitude and behavior). Klimmt (2009) hypothesized that – due to players being able to change game events – interactivity increases the personal relevance of the social message and may as a result be especially effective.

According to Klimmt, Vorderer, and Ritterfeld (2007) one way to interact in the game is to impact game content, such as the game narrative. For instance, a player can decide in which direction a game character should go and can learn about the direct link between their own actions and the consequences related to them (Green & Jenkins, 2014). Other ways of interacting are via further game mechanics of selecting how a character should look like or what items to use, which are also choices determined by the rules provided by the game system, but may not necessarily affect the game narrative (Elson et al., 2014). Similar to Klimmt (2009), Elson et al. (2014) further argue that *narrative choices* can make the game story personally relevant for the players, because by choosing and not only following the narrative path, players make the story more likely to fit what they perceive as relevant or meaningful in their own life. As a result, it is possible that choices in narratives of interactive media affect the narrative or game experience and players' own thoughts and emotions related to them. This could come down to the players experiencing *responsibility* for the course of the game narrative and this self-connection could transfer to an increase in knowledge and comprehension of the social message (Green & Jenkins, 2014), which could lead to an increase in prosocial behavior.

Two other psychological processes may explain the positive effect of interactivity in media onto experiential or behavioral outcome: *identification* and *appreciation* (Green & Jenkins, 2014). Identification has been defined as taking on the role of media characters and with it their goals and emotions (Cohen, 2001) and has also been addressed to be a reason for a game's effectivity to positively impact attitude (Jacobs, 2017). Equally, interactivity has been found to affect players' willingness to help and identify with the character (Peng et al., 2010). Participants who played the game Darfur is Dying rated their identification as higher and were more willing to help people having experienced the same struggle in Darfur, compared to participants who watched the game play or just read a text version of the same story. As

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the impact on prosocial behavior remained unclear, Steinemann et al. (2015) used donations as a measure for immediate and objective prosocial behavior after participants were confronted with the game *Darfur is Dying*. Similar to Peng et al. (2010), they compared interactive game play versus recorded game play in order to test the expected positive effect of interactivity on donations. They added interactivity via text (plain text and text with pictures) to their experimental design. In this way, they added multimodality as a second factor with three levels (plain text, text with pictures, game; all containing the same content), to further control for a potential confounding effect of multimodality on interactivity. Besides the positive effect of the interactive game condition, the interactive text version also positively affected donations. This effect was independent of multimodality and the participants' pre-existing trait empathic concern. While interactivity did *not* affect identification or willingness to help, it affected experienced enjoyment and appreciation. As appreciation was associated with both interactivity and donation, a mediation analysis showed that the effect of interactivity on donation was explained (fully mediated) by appreciation. This indicated that experiencing the interactive versions of the game as emotionally moving, thought-provoking and meaningful (i.e., *appreciation* as defined by Oliver & Bartsch, 2010) positively affected the real-life decision of players to donate. The notion that experiencing emotions during and after playing a meaningful game such as *Darfur is Dying* can affect real-life decision, was further supported by Cohen (2014) where positive emotions positively predicted sharing during game play and negative emotions positively predicted sharing the game with others during the week after play.

Besides appreciation, identification and experienced responsibility are discussed to be affected by the interactivity of the media in question, such as games or interactive narratives (Green & Jenkins, 2014; Klimmt, 2009). Green and Jenkins (2014) suggest that such psychological processes may explain why providing users with control in interactive media can lead to a desired outcome such as behavioral change. Steinemann et al. (2015) presented first empirical support for one serious game positively influencing prosocial behavior. It demands, however, further replication as serious games can vary widely in their content and form of interactivity and hence in how they may affect cognitive, emotional or behavioral outcomes differently (Klimmt, 2009). This complicates a reliable prediction of real-life prosocial behavior within serious games research, but may also be problematic for understanding how interactivity affects users in games and interactive narratives. The scarcity

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of research into the effects that serious games have upon actual behavior (Steinemann et al., 2015), alongside the value in being able to understand the effect that making choices within interactive media has upon real-life behaviors, requires additional research including studies with larger participant samples, better established methodologies and the replication of existing studies within new contexts (Ruggiero, 2015). The first study, described in ‘Manuscript 1’, therefore replicated the study of Steinemann et al. (2015) by investigating the effect of a new bespoke narrative, with more participants and in a preregistered setting¹, allowing for a methodological improvement of the experiment. Furthermore, additional psychological experiences related to the narrative were assessed, to increase the understanding of the effect of being able to choose as a possible form of interactivity on real-life donation representing social change.

Summary of Manuscript 1: Interactive Narratives Affecting Social Change - A Closer Look at the Relationship Between Interactivity and Prosocial Behavior

Motivation and Predictions. Previous studies on games for social change support that interactivity positively influenced attitudes, willingness to help and prosocial behavior (Peng et al., 2010; Ruggiero, 2015; Steinemann et al., 2015). These studies have in common that a central interactive characteristic of the games investigated was the choices being made in them. Despite of their goal to improve prosocial behavior, effects on actual behavior are rarely demonstrated but were found to be related to the experience of appreciation (Steinemann et al., 2015). The improvement of the effect of interactivity on prosocial behavior is important, both from an academic (Ruggiero, 2015) and practical prospect (Klimmt, 2009). Therefore, this study looked at identification, responsibility, and appreciation to explain the positive effect of making narrative choices on prosocial behavior. The predictions were based on the theoretical model of Green and Jenkins (2014), which includes predictors for the facilitation of changes in attitude and behavior, and hence the effectiveness of interactive narratives. As lined out in their conclusion, the two most interesting positive predictors to persuade readers, in terms of empirical

¹The goal of the issue that this paper was published in, was to increase research quality in the field of Science of Technology and Human Behavior. Before data collection, we were required to submit the full theoretical background, hypotheses, method and analysis plan for peer-review. In this way, the guest editors of the JMP special issue could ensure confirmatory hypothesis testing. For more details refer to Elson and Przybylski (2017).

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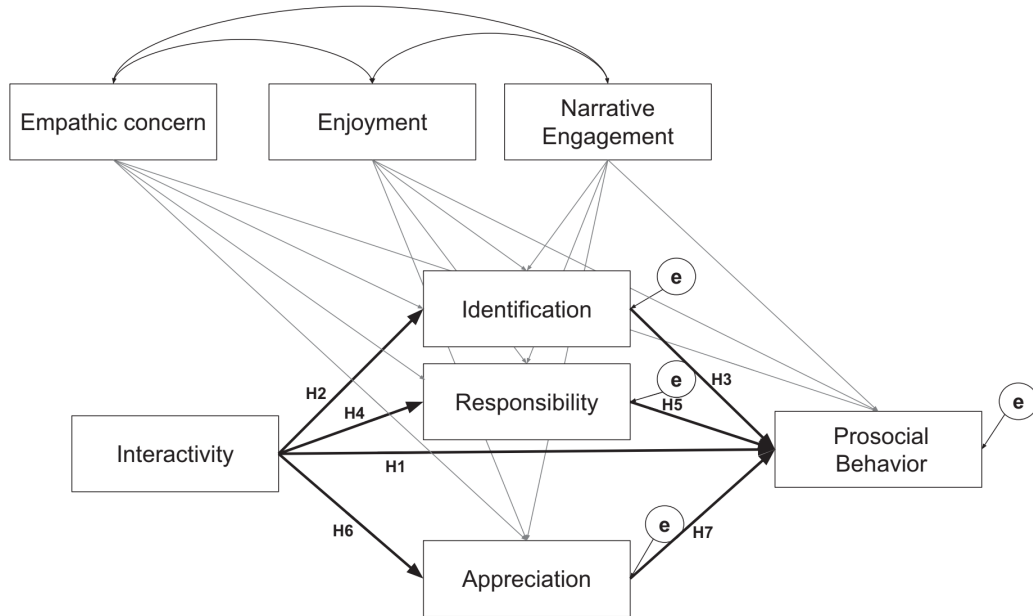


Figure 1. The predicted model with the processes explaining the relationship between interactivity and prosocial behavior (i.e., donation).

support and worth further replication, are identification with the characters and experienced responsibility for the choices. Responsibility is furthermore interesting because, outside of games research, reminding people of their own responsibility of a real act in history has been found to be associated with empathy (Čehajić, Brown, & González, 2009). Appreciation was also part of the theoretical model, but was treated as an outcome variable besides behavior (Green & Jenkins, 2014). For the predicted model of the presented study (see Figure 1), appreciation was included as a further predictor, as it mediated the effect of interactivity onto prosocial behavior in the previous study by Steinemann et al. (2015).

Method. We conducted a between-subject experiment with the independent variable interactivity operationalized as 8 narrative choices that participants either could or could not make within the narrative. The primary outcome variable prosocial behavior was operationalized as the share of the monetary reward that participants donated to a charity. The expected mediators between interactivity and prosocial behavior were appreciation, identification and responsibility, whereas enjoyment, narrative engagement and empathic concern served as control variables. The study was conducted online on the crowdsourcing platforms Amazon

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Mechanical Turk and Crowdfunder, where 854 participants started the study, but 220 participants had to be excluded because they did not pass the checks used to ensure data quality. This resulted in 331 participants in the choice and 303 in the no choice condition (Total sample size of $N = 634$). A MANOVA revealed that the two samples (of the two platforms) did not significantly differ in the effects relevant for the hypotheses.

To ensure participation until the end of the study, participants were promised to receive \$0.20 up-front, but would gain an additional \$1 if they carefully answered all questions and followed all instructions. After the empathic concern questionnaire, participants were randomly assigned to either the interactive or non-interactive narrative about a parent and their kids struggling to find a place to stay because they became homeless (“How I Became Homeless”, Marcus, 2014, December). This study used a yoked design to ensure that interactivity was not confounded by the information being presented to the participants in the different conditions. This was implemented as follows: In this narrative, participants of the choice version had to make 8 decisions which created several different story lines, all leading to the same ending. These stories were stored on an external platform after each participation. The story lines were then randomly given to participants in the no choice condition. After presenting all other questionnaires on appreciation, identification, responsibility, enjoyment and narrative engagement, participants were asked whether they would like to donate all or a portion of their \$1 bonus to a charity that helps people in situations similar to those the narrative depicted.

Results. Following the previously planned and preregistered planned analysis, a path analysis model was used to answer the 7 hypotheses. As donation and responsibility were found to be heavily non-normally distributed, a standard error bootstrapping and Satorra-Bentler correction were used (Kline, 2011). As the full model (see Figure 2) had a good fit ($\chi^2 = 3.68$, $df = 3$, $p = .299$) and trimming paths of the control variables resulted in a significantly poorer fit ($\chi^2_{diff} = 927$, $df_{diff} = 15$, $p < .001$), the full model was used for the confirmatory analysis. Two of the seven hypotheses could be confirmed, in that interactivity lead to more responsibility (H_4 , $\beta = .23$, $SE = 0.12$, $p < .001$) and appreciation was positively related to donation (H_7 , $\beta = .17$, $SE = .02$, $p = .005$). Interactivity did however neither lead to higher donation (H_1 , $\beta = .02$, $p = .696$), nor identification (H_2 , $\beta = -.03$, $p = .169$) nor appreciation (H_6 , $\beta = -.05$, $SE = 0.05$, $p = .056$). Unexpectedly, while responsibility was not related to donation (H_5 , $\beta = .08$, $SE = 0.01$, $p = .08$), identification was

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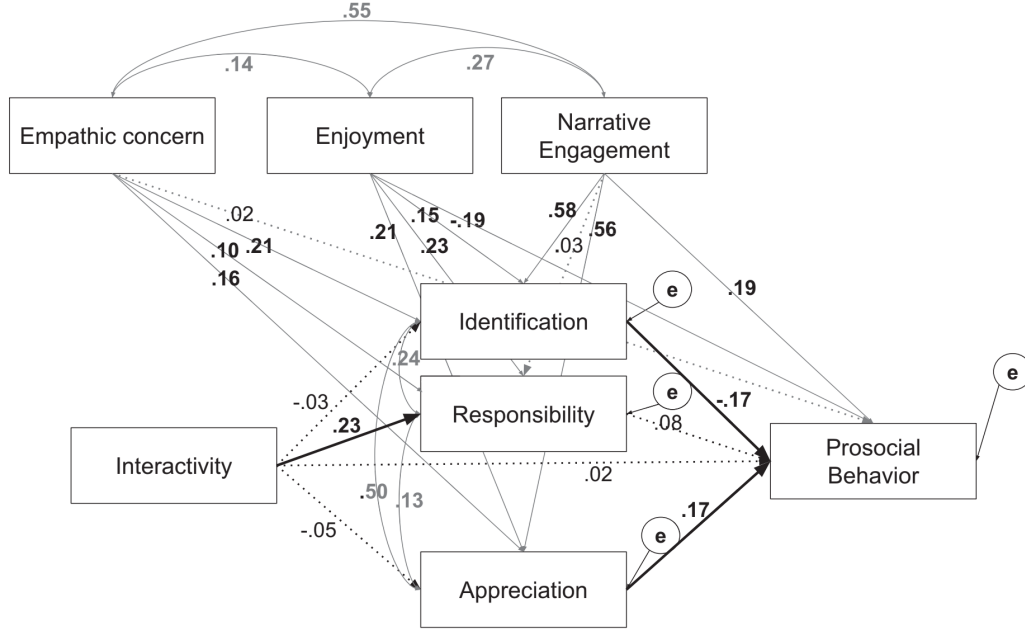


Figure 2. Structural Equation Model of the confirmatory analysis with solid and bold lines as the significant paths and dotted lines as the insignificant paths of all predictions (H₁-H₇). Bold numbers indicate significant paths.

significantly negatively related to donation (H₃, $\beta = -.17$, $SE = 0.03$, $p = .013$).

To find an explanation for this unexpected finding on identification (H₃), an exploratory analysis was conducted with the question on experiencing similar conditions as a further dichotomous predictor. Again, the resulting model still had a good fit ($\chi^2 = 16.60$, $df = 14$, $p = .278$, $CFI = 0.998$, $RMSEA = .02$, 90% CI [.00, .04]). In this model, the negative path from identification to donation was no longer significant ($\beta = -.12$, $SE = 0.03$, $p = .112$), while having experienced such circumstances significantly negatively predicted donation ($\beta = -.13$, $SE = 0.03$, $p = .001$). An overview of all hypotheses tested (including the exploratory analysis) is shown in Table 1.

Discussion. Compared to previous work and against expectations (Green & Jenkins, 2014; Peng et al., 2010; Ruggiero, 2015; Steinemann et al., 2015), interactivity did not affect donations as prosocial behavior, which could be explained by the differing characteristics of the narrative underlying the investigated media across the studies. In our case, the interactive narrative dealt with decisions that

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Table 1
Overview of hypotheses, exploratory analyses, and corresponding results.

Confirmatory Analysis		
Hypothesis	Finding	Hypothesis confirmed
H ₁ : Interactivity will lead to a higher percentage donated.	$\beta_{H_1} = .02$	No
H ₂ : Interactivity will lead to more identification with the character.	$\beta_{H_2} = -.03$	No
H ₃ : Identification will be positively related to a higher percentage donated.	$\beta_{H_3} = -.17$	No
H ₄ : Interactivity will lead to more responsibility.	$\beta_{H_4} = .23$	Yes
H ₅ : Responsibility will be positively related to a higher percentage donated.	$\beta_{H_5} = .08$	No
H ₆ : Interactivity will lead to more appreciation.	$\beta_{H_6} = -.05$	No
H ₇ : Appreciation will be positively related to a higher percentage donated.	$\beta_{H_7} = .17$	Yes
Exploratory Analysis		
Research Question	Finding	Supported
RQ1: Does experiencing similar circumstances impact the percentage donated?	$\beta_{RQ_1} = -.13$	Yes

did not lead to negative or severe consequences in the end, as the parent and their children ended up in a safe place with friends. Although interactivity had an effect on responsibility, both conditions had relatively low mean scores that fell below expectations. This hints to the choices not leading to clear enough consequences that players feel responsible for and illustrates a perceived disconnect between players' choices and narrative consequences. While being able to make choices (Green & Jenkins, 2014; Steinemann et al., 2015) or perceive to have a choice (Ellithorpe, Ewoldsen, & Oliver, 2015) is an important predictor for prosocial behavior, simply adding choices to make a narrative interactive was not enough to lead to prosocial behavior. As appreciation for and engagement with the investigated narrative were significantly related to prosocial behavior, offering more engaging and meaningful choices within narratives may be more effective in impacting prosocial behavior. In this case however, the choices made did not have notable consequences on the outcome of the story, and hence choices were not meaningful to the outcome. This may help explain the lack of effect that interactivity had upon behavior change.

A methodological reason for interactivity not having an effect on prosocial behavior may be that previous studies (Peng et al., 2010; Ruggiero, 2015; Steinemann et al., 2015) did not use preregistration or a yoked design and may have had less power to reliably estimate the effect than the approach used in 'Manuscript 1'. First, if the manipulation of interactivity is not yoked, it becomes difficult to infer whether the effect occurred because it was interactive or because the presented information changed. Second, the nature of the preregistration for peer review ensured confirmatory hypothesis testing and achievement of at least a statistical power of 80%, increasing the reliability of the results compared to previous research.

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Therefore, the result that interactivity had no effect on prosocial behavior has to be considered robust under these experimental conditions. To be considered further is the negative effect we found of having experienced similar circumstances explaining the negative relation between identification and donations. This may, in light of the findings of the exploratory analysis, be due to people with similar experiences thinking that donations may not help in these social situations. As a result, character identification was less important to predict prosocial behavior than appreciation for and engagement with the narrative.

In sum, an important insight gained from this study is that the null finding concerning interactivity underlines that this kind of interactivity may have to be reconsidered and further examined, in order to understand under which conditions interactivity works to affect prosocial behavior.

Meaningfulness - Interactive Media Affecting the Experience Related to Deep and Insightful Emotion and Cognition

Digital games typically attempt to positively affect players, usually with the goal of providing entertainment, fun, and enjoyment. However, it has been empirically shown that games can also lead to being emotionally moved (Bopp et al., 2016; Granic, Lobel, & Engels, 2014; Grizzard et al., 2014), change attitudes towards minorities (Ruggiero, 2015) and impact real-life prosocial behavior (Steinemann et al., 2015). The interactive nature of digital games facilitates players to engage with the game content and narrative in a way that suits their desires and personal lives, and may be powerful enough to increase meaningful experiences (Elson et al., 2014) such as appreciation (Steinemann et al., 2015). Nevertheless, results have been inconsistent, as not all interactive media lead to the supposed effects on meaningful experiences (Manuscript 1; Shafer, Janicke, and Seibert, 2016).

Perhaps the effects depend on how interactivity was defined and operationalized and in what context interactivity (such as making choices) was investigated. Examining studies that did not find the effect, researchers did either adapt an existing story to create an interactive narrative (Manuscript 1) or created an interactive movie (Shafer et al., 2016) for the experimental investigation. In comparison, the studies supporting the effectivity of the serious games (Peng et al., 2010; Ruggiero, 2015; Steinemann et al., 2015), used preexisting serious games (Spent, Darfur is Dying). These preexisting serious games were successful in positively affecting people and considered to be good examples of games for change prior to their use within

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these studies. So it might be plausible that they offer better play experiences compared to bespoke games as used in studies finding no effects (Manuscript 1; Shafer et al., 2016). This means that the effect of interactivity cannot be separated from the effect of a simply well-done game.

In order to be able to control the effect of an experimental factor, such as a narrative choice, the stimuli material (e.g., narrative or game) has to be manipulated in order to investigate the effect of this change. Hence, creating a new game or narrative that will be made interactive or where choices and their consequences can change, is advantageous for the comparability of the experimental conditions. In addition, it is less likely that participants have already played the game and the differing familiarity or novelty may be a confounder of the effect to investigate.

It is also probable that player experiences in relation to hardship and struggle were more intense in the studies investigating the preexisting games (Jacobs, 2016; Peng et al., 2010; Ruggiero, 2015; Steinemann et al., 2015), compared to the bespoke versions created for the experiments that showed no effect (Manuscript 1; Shafer et al., 2016). In *Spent* and *Darfur is Dying*, the choices had harsh consequences where the character either runs out of money to pay the rent and will become homeless (*Spent*) or will be subject to brutal treatment (*Darfur is Dying*). The choices for the paths made in these games could have been experienced as more meaningful as a result of them having harsher consequences. Whereas in ‘Manuscript 1’ most consequences were less dire, as the character either could decide to stay at a friend’s or the parent’s place to stay for the night, and ultimately could stay with friends until a new home was found. Furthermore, Bogost (2007) states for serious games to be effective, they have to present decisions that demand mental effort of their players. If the consequences are more dire, it could be more likely that player experience the decision as harder, as they put more effort in weighing the options or predicting the consequences of the decision.

For a game to have serious and longer lasting effects on the audience, it should contain narratives that transfer values important to the audience so as to promote social change (Klimmt, 2009). Experiences that go beyond enjoyment (e.g., fun, thrills) and relate to personally relevant values, have been associated with meaningfulness such as appreciation in media, which is defined as an “experiential state that is characterized by the perception of deeper meaning, the feeling of being moved, and the motivation to elaborate on thoughts and feelings inspired by the experience” (p. 76, Oliver & Bartsch, 2010). Appreciation is relevant for social change, as it

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has been found to be associated with perspective taking (Bowman et al., 2016), similar to identification which improved attitudes as found by Peng et al. (2010), but appreciation also has the potential to influence behavior (Steinemann et al., 2015).

In empirical research on games, there has currently been an increase in interest of what constitutes meaningful game experiences (Oliver et al., 2015; Rogers et al., 2017). Following the suggestion of Elson et al. (2014), this first set of game studies qualitatively explored what players identify as meaningful game experiences, supported by quantitative data (Oliver et al., 2015). To our knowledge, there have been no experimental studies on meaningful choices in games. Exploring under which conditions these interactive elements are experienced as meaningful, may add a new important layer to the creation of the overall meaningful game experiences as suggested by Elson et al. (2014). Experimental quantitative research should then further support that the implementation of the qualitatively evaluated game characteristics would lead to increased appreciation (Elson et al., 2014). As especially narrative elements have been suggested to lead to an association of values on the players' side (Klimmt, 2009), a central question of the second manuscript was therefore how players understand meaningful choices - especially in narrative rich games - and what other reactions (emotional and cognitive) are associated with the experience of the choice.

Summary of Manuscript 2: Choosing to Help Monsters: A Mixed-Method Examination of Meaningful Choices in Narrative-Rich Games and Interactive Narratives

Motivation and Predictions. Previous research on meaningful experiences has found a wide variety of attributes associated with the experience of meaningfulness. For instance, Bopp et al. (2016) found that experiencing loss and contemplativeness as being empirically related to meaningful experiences. Furthermore, social connections (Oliver et al., 2015) and moral dilemmas (Rogers et al., 2017) were also related to meaningful experiences in games, such as in *Star Wars: Knights of the Old Republic* or *The Witcher 3*. Further interesting game attributes are choices, especially moral choices, with consequences which were discussed to be responsible for the choices being perceived as meaningful (Nay & Zagal, 2017). That the choice is autonomously done by the player or reader of the interactive narrative, was seen as crucial for learning because it necessitates the understanding of what will happen as a consequence of the choice (Patall, Cooper, & Robinson, 2008). As learning

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has been argued to be related to changes in attitude (Klimmt, 2009; Steinemann et al., 2015; Zahn et al., 2014), how choice consequences are perceived and processed may be important for meaningful experiences in the context of interactive media affecting social change. The goal of this empirical project was to examine whether these characteristics would also be relevant for meaningful choices. To do so, we conducted two different studies.

Method Study 1. An exploratory and qualitative survey first investigated the associations players made in games when they think of their experiences with meaningful choices. The reports on 24 different (mostly narrative-rich) games of 27 participants were coded in an iterative process of a deductive thematic analysis (Clarke, Braun, & Hayfield, 2015), which bases the creation of the code categories on previous theoretical assumptions.

Results Study 1. The three major themes that were found in this exploratory survey were the following associations with meaningful choices: First, players expressed different kinds of consequences that influenced their decision making. Often they only knew - while deciding - that short-term consequences would follow their decision. For instance, they knew that their player characters would change but not how they would change. Furthermore, choices added to the meaningfulness, because they were unknown long-term consequences and very often harsh ones with lasting repercussions. Moreover, choices allowed players to directly influence the storyline or resulted in the experience of different story lines. Second, social encounters added to the meaningfulness of the choice, because participants developed emotional bonds to their characters. Participants also drew parallels to what they themselves would do if their own real-life friend would be in the same situation as the character affected by the choice. Third, players often reported choices where there was no right choice on a moral basis. For instance, in the post-apocalyptic world of *Metro 2033* (Games, 2010), participants could either act to destroy monsters to save humanity or not destroy them, as it was unclear whether the monsters really had destructive goals or were just misunderstood. This made the choice a moral choice, as one would act against an out-group. Further findings supported that meaningful choices could be related to strong emotional experiences, losses or accomplishments and suspense in terms of progressing in the game. The moral, social and consequential characteristics as themes however, were more prominent and mostly occurred together in narrative-rich games.

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	Choice	No Choice
High - Meaningful	Choose: <i>Pick flower for mother OR save friend</i>	Randomly assigned: <i>Pick flower for mother OR save friend</i>
Low - Meaningful	Choose: <i>Pick flower for strength OR turn back</i>	Randomly assigned: <i>Pick flower for strength OR turn back</i>

Figure 3. Each participant was randomly assigned into one of these four cells. For example, “Pick flower for mother”: The option describes that the character can get to the healing flower and picking it would mean to save the mother from a fatal disease.

Method Study 2. As the original goal of the study was to investigate the causal link between the interactive narrative and the experience of appreciation, the three themes (moral, social and consequential choice characteristics) were combined and applied in a narrative specifically written for the second study. Thereby, the results of the qualitative survey informed the design of the narrative which was then further tested in study 2. As several games reported in study 1 were fantasy games and demanded to choose sides (between in- and out-group), the short narrative of this experiment was about an adventurer who befriended a dangerous fantastical creature (called a werebear). With this new friend in acquaintance, the adventurer encounters several obstacles. The only information that differed between the groups was the choice that was presented at the end of the story. To control for the individual outcome of the choice, the interactivity conditions were yoked similar to ‘Manuscript 1’. Meaningfulness was manipulated by framing the choices differently, with the addition of choice characteristics that should, according to study 1, result in the experience of a meaningful choice. In the low-meaningful condition, the participant was given the choice between a quick and safe progress or gaining unparalleled strength as reward for stealing the healing flower from a dragon. In the high-meaningful condition, they were given the choice to save their new friend or their very ill mother by stealing the healing flower from a dragon. The details can be read in the Supplementary Materials of the full paper. An overview of the 2x2 design is shown in Figure 3. The high-meaningful choice was intended to mirror the moral dilemma, as found in study 1 and Rogers et al. (2017) on general meaningful game experiences.

A total of 192 participants took part in the online study, where they first had to fill out the care morality subscale of the Moral Foundation Theory questionnaire

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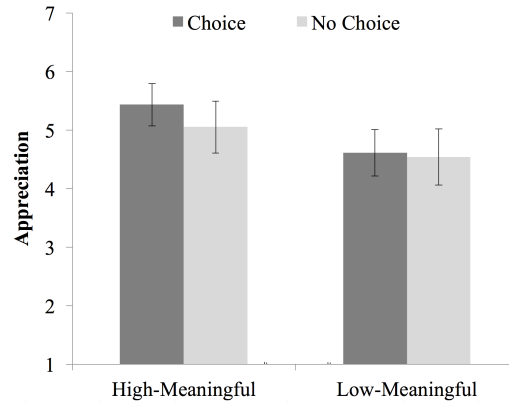


Figure 4. Mean differences in the rating of appreciation across conditions. Error bars represent the 95% confidence intervals.

(Haidt & Joseph, 2007), representing the tendency of morally valuing to care for people and avoiding to harm them. This served as control variable similar to empathic concern in Steinemann et al. (2015) and ‘Manuscript 1’. Then, they were randomly assigned to 1 of the 4 narratives. The questionnaires of appreciation, enjoyment and narrative engagement were then presented to control for narrative experience. Similar to ‘Manuscript 1’, participants were asked to describe the story to check data quality.

Results Study 2. Care morality significantly correlated with appreciation ($r = .28, p < .001$), narrative engagement ($r = .26, p < .001$) and enjoyment ($r = .32, p < .001$), and was therefore included in the analysis model. The ANCOVA revealed a significant main effect for meaningfulness onto appreciation ($F(1,184) = 9.59, p = .002, \eta^2 = .044$) and the effect of care morality onto appreciation ($F(1,184) = 20.51, p < .001, \eta^2 = .093$). Furthermore, to answer whether the choice effect is different for high-meaningful versus low-meaningful, we conducted planned contrasts, indicating that choice in the high-meaningful condition led to a higher appreciation rating compared to the other three conditions. The mean differences are represented in Figure 4. However, enjoyment and narrative engagement remained unaffected by meaningfulness and interactivity (p-values between .067 and .997). A further analysis supported that the narrative choice outcomes did not differ significantly in terms of appreciation within the meaningful conditions (high-meaningful: $p = .976$, low-meaningful: $p = .339$).

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Discussion. First and foremost, the manipulation informed by the qualitative examination in study 1 has worked to causally affect the experience of appreciation independently of whether the choice could be made. A separate analysis revealed that choice indeed positively impacted appreciation when the narrative was highly-meaningful. These findings hint to implications that can help to explain why there was not always an effect of interactivity as choices on appreciation (Manuscript 1; Shafer et al., 2016). The herein empirically found choice characteristics could help to create more meaningful choices that increase the experience of appreciation, which has previously been found to be associated with prosocial behavior (Morgan, Movius, & Cody, 2009; Small & Simonsohn, 2007; Steinemann et al., 2015). Hence, these choice characteristics positively affecting appreciation may prove interesting for later studies investigating prosocial behavior.

Furthermore, the results suggest that different meaningful outcomes may not be interfering with the experience of meaningfulness, as it may be experienced to be negative either way. This supports the assumption by Nay and Zagal (2017) that what matters is not the outcome itself, but the players' perception of how the in-game choice lead them to this outcome. However, the psychological processing of the choice and its impact on users seems to account for the experience of appreciation, which includes emotional, cognitive and perceptual processing when looking at the items representing appreciation (Oliver & Bartsch, 2010). Moreover, the felt impact of one's own choice is most likely also higher when moral and social elements are involved, such as when a character that the player cares about dies or is badly hurt, or when the player has to decide between the lives of two people or groups. While players are aware that these characters are not real, they often grow attached to and feel empathy for them as in real life (Krcmar & Cingel, 2016; Weaver & Lewis, 2012; Wehbe, Lank, & Nacke, 2017), and the choices may become difficult to make as the consequences are dire or permanent for the characters. Moral dilemmas, as already found in Rogers et al. (2017), were again a part of our findings in study 1, and in the narrative tested in study 2, as care morality correlated with appreciation. While not very frequent in our sample of study 1, accomplishment and emotional choices were also experienced in both studies as a result of progressing or getting a reward.

Limitations and Strengths. First, as we only had a limited sample size of 27 participants in study 1, it is likely that we have not covered all possible meaningful elements of narrative choices, such as the play experiences of suspense, emotional challenge or accomplishments which could also lead to high ratings of appreciation

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(Bopp, Opwis, & Mekler, 2018) and which would need future investigations. Second, only one choice was investigated, representing a rather small manipulation. However, as already this single choice had an effect, implementing more choices or even further interactivity features could lead to further and even larger interesting effects in future studies. Third, while previous research has argued that certain elements can make game experiences with choices meaningful, this study is the first to empirically confirm what is needed to causally affect appreciation after play, which is the evaluation of the choice (Salen & Zimmerman, 2004) as meaningful in a thought-provoking and emotionally moving manner. Further research could investigate the choice options independently, to analyze their individual contribution to the experience of meaningfulness. Fourth, an important strength of this study is the application of a mixed-method design, which allowed to qualitatively explore what choice characteristics are immediately associated with meaningfulness by players, which informed the creation of the interactive narrative of the experimental manipulation. In this way, conclusions of the first study could then be tested in the quantitative experiment, which strengthened the results through a more comprehensive and informative investigation (Johnson, Onwuegbuzie, & Turner, 2007).

The Effect of Digital Games on Real-Life Prosocial Behavior

To explain the effect of games on real-life behavior, scholars have very often relied on the General Learning Model (GLM) by Buckley and Anderson (2006). According to this model, game content determines what will be learned (in the short- but also in the long-term) and hence potentially expressed as real-life behavior. The short-term processes of this framework include the exposure to stimuli such as games that prime cognitive processes and increase affect and arousal (e.g., Saleem, Anderson, & Gentile, 2012). Previous empirical work supports the prediction of this model (Gentile et al., 2009; Greitemeyer, Agthe, Turner, & Gschwendtner, 2012; Harrington & O'Connell, 2016; Prot et al., 2014). Furthermore, an overview of the potential effects of video games on prosociality is the meta-analysis of Greitemeyer and Mügge (2014), which again supports the GLM's assumption that participants behave in line with the prosocial or violent content of the game.

However, the model's predictive power for the multidimensional construct of prosociality has been challenged by a recent meta-analysis (Coyne et al., 2018), underlining that there are several potential moderators involved. This is corroborated by other findings in terms of the effect of games containing prosociality on real-life

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prosocial behavior has not always been consistent (e.g., studies finding effects: Gentile et al., 2009; Greitemeyer & Osswald, 2010; studies with null findings: Tear & Nielson, 2013; Teng et al., 2018), further supporting that there may be unexplained variables involved. Researchers often selected different games for the experimental conditions (e.g., Gentile et al., 2009; Greitemeyer & Osswald, 2010; Tear & Nielsen, 2013; Teng et al., 2018). For instance, Chibi Robo and Super Mario Sunshine (as the prosocial game) were compared to the violent games Ty the Tasmanian Tiger 2 and Crash Twinsanity, and the neutral games Pure Pinball or Super Monkey Ball Deluxe in the study of Gentile et al. (2009). Although they also controlled for the possible variations by assessing further control variables related to the game stimuli (affect, arousal, liking, perceived difficulty), the selected games still differed distinctly in other crucial aspects (content, game mechanics, characters, presentation or popularity), which could also have confounded the findings.

As the meta-analysis of Greitemeyer and Mügge (2014) was conducted by categorizing games into either pro- (help) versus anti-social (harm) game content, they hypothesized that if games contain prosocial content along with violence, the supposed effects may be smaller. It is, however, possible that players still behave prosocially after having engaged in violent as well as prosocial acts in games, which has been found by Harrington and Connell (2016). They have observed that young participants engaged in both violent and prosocial acts, which was associated with cooperation, sharing and empathy, while engaging in violent in-game behavior was controlled and had no effect on this outcome. However, as Harrington and Connell (2016) have collected data on the effect of subjective reports on different games and their findings were of correlative nature, experimentally investigating a game with both prosocial and violent contents is therefore of interest. When experimental studies looked at games containing prosocial along violent content, the findings were inconsistent in relation to subsequent prosocial behavior (Ellithorpe, Cruz, et al., 2015; Happ, Melzer, & Steffgen, 2013).

The variety of game examples reported by Rogers et al. (2017) and observed in ‘Manuscript 2’ support that games having effects on player experience also contain ambiguous content, where a player sometimes has to sacrifice something and act violently in order to reach a higher moral goal, such as sacrificing a few in order to save a society (e.g., Star Wars: Knights of the Old Republic, The Walking Dead, This War of Mine). This indicates that game content may be a mixture of prosocial and violent events that will complicate the prediction of prosociality. Therefore, this part

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of the dissertation focuses on the effect of a prosocial in-game decision to help another character in need, where this decision had a specific, prosocially relevant consequence for the player in the context of a first-person-shooter game. As found in the study of Krcmar and Cingel (2016), decisions were reasoned differently (i.e., moral or strategic reasoning), perhaps because players perceived the choice consequences as different. While in ‘Manuscript 2’ we have indicated that consequences of players own decisions partially affect how they experience the game, perhaps the effect of an in-game decision on prosocial behavior depends on this consequence and the perception of it. In comparison, the focus of the third study was whether reward does affect players’ reasoning of their own in-game decision, and whether reasoning and reward could affect real-life prosocial behavior following game play.

Summary of Manuscript 3: Deciding to Help In-Game Increases Real-Life Prosocial Behavior – The Impact of Reward and Reasoning

Motivation and Predictions Study 1. Many scholars have become interested in the potential of digital games to foster prosocial behavior. If the message that the game contains is prosocial (as defined by the investigating researchers), then real-life behavior after playing was often more prosocial than if the game contained no such message (Gentile et al., 2009; Greitemeyer, Agthe, et al., 2012; Greitemeyer & Osswald, 2010; Velez et al., 2014). Nevertheless, findings turned out inconsistent when looking at studies investigating game content that was a mix of violence and prosociality (Ellithorpe, Cruz, et al., 2015; Happ et al., 2013), hinting that there are unexplained mechanisms involved when predicting prosocial behavior. Investigating mixed game content is therefore needed (Joeckel & Dogruel, 2016), also because several very popular digital games contain social or even prosocial events while also containing violence (e.g., the Mass Effect, Fallout, or BioShock series).

Studies conducted outside of games research have shown that if people behaved prosocially in one situation, they tend to act in a prosocial manner in the subsequent situation, which is called *moral consistency* (for an overview see Mullen & Monin, 2016). However, it is also possible that people behave less prosocially as they saw the previous social act as a license to act less morally later (i.e., *moral licensing*, Merritt, Effron, & Monin, 2010). Research looking into moral consistency and licensing effects also found that acting *voluntarily* in a prosocial manner could moderate the occurrence of consistency and licensing, which has yet rarely been investigated in the context of digital games (Joeckel & Dogruel, 2016). A first study described in the

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third manuscript therefore looked at whether a voluntary prosocial in-game decision in a violent game would lead to more prosocial behavior. Furthermore, providing reward is a factor that also affected the occurrence of prosociality (Zuckerman et al., 1979), but has also not been experimentally investigated in games research. Hence, a follow-up experiment looked at the role that reward would play in predicting the same prosocial behavior in the same mixed game context.

Method Study 1. To test the predictions, an online study was created with a first person shooter game (FPS) in two versions, with the mission to escape alive from an island with the threat of attacking zombies and robots. Participants randomly assigned to the experimental group ($n = 171$) received an additional mission where they were free to help a starving man, while participants randomly assigned to the control group ($n = 99$) were not shown this quest, but were otherwise exposed to the same game content. Agreeing to help ($n = 96$) resulted in a loss of health points as participants were harmed while helping the man. Refusing to help ($n = 75$) did not have these disadvantages. With different difficulty levels, clear instructions, and extensive pretesting, it was ensured that players could finish the game. In the end, all of the 270 participants finished the game, whereas most of them (approx. 70%) finished the game in under 20 minutes. The perception of prosociality was assessed to check whether choosing to help changed the perception of the players as intended. In the end, participants were asked whether they would have us donate a part of their study payment (\$1) to a charity (Against Malaria Foundation). Finally, participants who were shown the quest were asked whether they expected a reward for helping the man.

Results Study 1. Participant who decided to help the man perceived themselves as more prosocial compared to participants not helping and participants in the control group (Kruskal-Wallis $\chi^2 = 19.81$, $df = 2$, $p < .001$, $\eta^2 = .06$). Table 2 shows the means and standard deviations across all three investigated groups of the quantitative measures.

Corresponding to the mean differences in the prosocial self-concept, the helpers also donated a higher percentage compared to the non-helpers and the control group (Kruskal-Wallis $\chi^2 = 6.12$, $df = 2$, $p = 0.047$, $\eta^2 = .04$), and were at the same time more likely to donate than the two other groups ($\chi^2 = 7.10$, $p = 0.029$, $OR = 2.34$). Interestingly, those who did not expect a reward, donated significantly more than those who expected a reward ($W(106,65) = 2749$, $p = 0.015$, Cohen's $d = 0.35$).

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Table 2

Descriptive Statistics across the three groups.

Condition	N	Prosocial Self-concept	Donation (%)
		Mean (SD)	Mean (SD)
No Help	75	4.80 (1.32)	7.53 (14.53)
Help	96	5.45 (1.47)	17.19 (21.89)
Control	99	4.67 (1.38)	11.01 (17.67)

Discussion Study 1. While the results of study 1 are in line with previous games research (Gentile et al., 2009; Greitemeyer & Mügge, 2014; Greitemeyer, Traut-Mattausch, & Osswald, 2012; Happ et al., 2013), as players acted morally consistent, the interesting mechanism from a psychological perspective is that the effect of in-game helping may have to do with the subjective perception after the in-game decision and the expected consequence (i.e., reward). However, a tendency to be more empathic towards others may also explain the influence of the voluntary decision onto prosocial behavior (Batson & Powell, 2003), which we had not controlled for. Furthermore, the association between reward expectation and donation cannot causally be interpreted, as it was not experimentally varied. Hence, we controlled for the influence of these two variables in the second study.

Motivation and Predictions Study 2. The provision of reward as a consequence of completing a mission is a characteristic game element (Phillips, Johnson, & Wyeth, 2013). While reward serves to positively reinforce in-game behavior (Phillips, Johnson, Wyeth, Hides, & Klarkowski, 2015), it may further affect players in their perception of this behavior (Heron & Belford, 2014; Murphy & Zagal, 2011). Specifically, previous work in and outside of games research has discussed that reward could undermine the motivation to act prosocially in the future (Batson & Powell, 2003; Bekkers & Wiepking, 2011; Kou, Johansson, & Verhagen, 2017). In a recent investigation, players' reasoning of their in-game decisions could be described as *moral* (i.e., prosocial) and *strategic* (Krcmar & Cingel, 2016). Knowing about the decision motives could predict whether moral consistency would occur and hence be relevant for the prediction of subsequent prosocial behavior (Clot, Grolleau, & Ibanez, 2016; Effron, Cameron, & Monin, 2009). To our knowledge, the effect of reward on in-game reasoning and real-life behavior has not been experimentally investigated and was thus an aim of the second study. Furthermore, while it has only been found that the provision of rewards for being prosocial in the game community

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of League of Legends was empirically associated with a lower motivation of being prosocial in the future (Kou et al., 2017), we now experimentally tested whether in-game rewards would affect reasoning of the in-game helping decision.

Method Study 2. To test these predictions, the same FPS game of study 1 was modified into three versions for the second online study: In two versions, a reward (a powerful weapon) was provided after completing the mission to help the starving man. Either the reward was announced beforehand (Reward Promised condition) or only after mission completion (Reward Surprise condition). In a third version, there was no reward given for help. Again, players could voluntarily decide whether to help the same starving man or not. Hence, in the analysis participants deciding not to help the NPC constituted a fourth group (No Help). Before playing the game, empathic concern (Davis, 1983) was measured to control for participants' general empathic tendency. After participants played the game, they had to rate their prosocial self-concept. They were asked to provide reasons for helping or not helping the game character, and were given the opportunity to donate all, a part or none of their participation payment to the same charity as in study 1. For this study, a total of 185 participants with good response quality could be used for analysis. Applying the coding system of Krömer and Cingel (2016), reasoning responses were coded by two independent raters into strategic, moral, mixed (i.e., responses contained moral & strategic reasons) and other reasons with a substantial interrater agreement ($\kappa = .907$).

Results Study 2. While empathic concern was significantly correlated with prosocial self-concept ($r = .56, p < .001$), it did not significantly predict whether participants decided to help or whether they donated, and the empathic concern rating was not significantly different among the four groups (No Help, No Reward, Reward Surprise, Reward Promised) with $\chi^2 = 1.11, df = 3, p = .774$. Again, the manipulation of the prosocial self-concept over Help/No Help and provided Reward worked, with the biggest rating in the No Reward group ($\chi^2 = 17.60, df = 3, p < .001, \eta^2 = 0.016$).

Among all groups, the decision to donate (yes/no) differed significantly ($\chi^2(3, N = 185) = 7.93, p = 0.048$), with participants who helped for no reward being approximately twice as likely to donate than participants who did not help and participants who helped but received an unannounced reward for help. The difference among the four groups concerning percentage donated, was however not significant with $\chi^2 = 6.96, df = 3, p = .073, \eta^2 = 0.04$. Thus, among all four groups the

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amount donated was not different, but the decision whether to donate was. Table 3 shows the means and standard deviations of all quantitative variables assessed.

Table 3

Descriptive Statistics across all 4 groups.

Condition	N	Empathic Concern	Prosocial Self-concept	Donation (%)
		Mean (SD)	Mean (SD)	Mean (SD)
No Help	29	4.74 (1.07)	4.12 (1.95)	11.03 (23.35)
No Reward	45	4.94 (0.84)	5.79 (1.08)	25.56 (33.68)
Reward Surprise	47	4.74 (0.96)	5.11 (1.53)	16.17 (30.97)
Reward Promised	64	4.84 (0.88)	5.32 (1.36)	20.31 (29.22)

Participants providing moral reasons for helping (e.g., “Because helping people is good”, P74) had a higher prosocial self-concept ($M = 5.85$, $SD = 0.95$) than participants providing strategic reasons (e.g., “Traditionally, taking the harder path in a video game will offer a larger reward.”, P81) ($M = 4.92$, $SD = 1.63$) with $t(152.89) = 4.48$, $p < .001$, Cohen’s $d = 0.70$. Moreover, participants only providing strategic reasons donated less than all other providing mixed, moral or other reasons ($b = -0.73$, $SE = 0.30$, $t = -2.46$, $p = 0.014$, $OR = 0.48$). In addition, strategic reasoners were also the least likely to donate ($\chi^2(1, N = 185) = 4.42$, $p = 0.036$, $OR = 0.51$), whereas moral reasoners were most likely to donate ($\chi^2(1, N = 185) = 4.23$, $p = 0.040$, $OR = 2.01$). Table 4 shows the means and standard deviations of percentage donated across groups and types of reasoning. Finally, getting a reward made it significantly less likely that players provided only moral reasons for helping in-game ($\chi^2(1, N = 156) = 4.57$, $p = 0.033$, $OR = 0.44$).

Discussion. Our results imply that reward could play a crucial role in predicting real-life prosocial behavior after play. It is likely that getting no reward is better for a positive social change, as observed in the reasoning and behavioral data. These results support previous assumptions in games research (Murphy & Zagal, 2011; Zagal, 2012) and correspond to empirical work on psychology outside games research (Warneken & Tomasello, 2008; Zuckerman et al., 1979). Supporting the assumptions of Kou et al. (2017), Sicart (2009) and Zagal (2012), in-game reasoning was related to both reward (e.g., praise versus a better weapon) for help in-game and real-life donation, it is reasonable to keep an eye on the potential effect of in-game reward provision onto different ways to reason in-game and prosocial behavior in real life. As moral reasoning was positively related to donating, different

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Table 4

Number of participants providing the specific kind of reasoning, mean percentage of donation, and standard deviation of each condition and by in-game reasoning type regarding percentage donated.

Condition	Reason for (no) help	Number of Cases N(%)	Donation (%) Mean (SD)
No Help	Strategic	24(13.0%)	13.33(25.14)
No Reward (Helped)	Strategic	16(8.6%)	28.75(35.94)
	Moral	24(13.0%)	20.42(30.71)
Reward Surprise (Helped)	Strategic	21(11.4%)	7.62(17.86)
	Moral	16(8.6%)	23.75(35.94)
Reward Promised (Helped)	Strategic	34(18.4%)	11.18(25.79)
	Moral	21(11.4%)	24.76(23.58)

patterns of moral reasons might be of interest for further investigations. Future studies could also look at whether the perception of the game goal or outcome is affected by different reward manipulations, because they could change the (perceived) cost of prosocial behavior (Batson & Powell, 2003). Studying different rewards may provide interesting insights into the potential of games affecting social change.

Both studies extend previous work (Gentile et al., 2009; Greitemeyer & Mügge, 2014; Greitemeyer, Traut-Mattausch, & Osswald, 2012; Velez et al., 2014) in that prosocial behavior in real life can be positively affected when players volunteer to help a game character in need in the context of a first person shooter game with several violent events. This experimental setting is similar to many popular video games (e.g., BioShock, MassEffect, Fallout) and it has hence to be considered that even a single prosocial decision can have positive effects in real life. It has however to be further examined how a mixed game setting, such as ours, would compare to other similar games with more salient pro- or antisocial content.

Finally, besides the mission to get off the island alive, our game had no elaborate narrative. Future studies could add more narrative content with varying choice consequences or different motivations of the character in need that are revealed after mission completion, as similar narrative consequences of choices have been found to be related to a higher appreciation (Oliver et al., 2015; Rogers et al., 2017), and appreciation experienced with effective media for social change has been found to correlate with real-life prosocial behavior (Morgan et al., 2009; Steinemann et al., 2015).

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General Discussion

Offering choices is one way to foster prosociality and is a form of interactivity that makes games and interactive narratives unique in their potential to affect users (Elson et al., 2014; Green & Jenkins, 2014). As the effect of actively and voluntarily choosing in interactive media onto real-life prosocial behavior has rarely been investigated experimentally, this dissertation aimed to shed light on the following research goals:

1. Can we replicate the effect of choices onto appreciation and prosocial behavior while investigating the psychological mechanisms responsible for the effect?
2. What choice characteristics are responsible for the experience of appreciation?
3. What is the role of reward in predicting real-life prosocial behavior after play?

Narrative Choices, Appreciation and Prosocial Behavior (Question 1)

The first study could not replicate the findings of Steinemann et al. (2015) that making choices leads to a positive effect on prosocial behavior and does therefore not correspond with previously found effects of games (Peng et al., 2010; Ruggiero, 2015). While the choices made resulted in higher ratings of responsibility, the decision to behave prosocially by donating was neither affected by the choices made nor by responsibility. Furthermore, being able to choose did not affect identification or appreciation, which does not correspond to the theoretical model of Green and Jenkins (2014). Appreciation however correlated significantly and positively with prosocial behavior, partially corresponding to Steinemann et al. (2015), where appreciation mediated the effect of making choices on prosocial behavior. As specifically appreciation was the only main predictor correlated with donation, but did not differ between the choice conditions, one learning from this first study was that choices have to be created in a different way so that they would become more powerful to also affect appreciation and prosocial behavior.

A possible reason for why in this study narrative choices did not affect prosocial behavior may be that the decision was not powerful enough to also affect the expected psychological processes like appreciation. A characteristic often discussed as a reason for choices being effective, was that decisions in the previous successful games had dire or even permanent consequences such as death or torture (e.g., *Darfur is Dying*, *Spent*, *My Cotton Picking Life*). Though impacted by making

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choices, the rating of responsibility was not specifically high across both conditions of our study. This further indicates that the decision options may not have been important and hence powerful enough for the reader to think that the decisions would really matter for the narrative consequences or outcome. Thus, certain choice characteristic related to choice consequences, or even narrative outcome, may have been responsible for a stronger effect of the previously investigated serious games on prosocial attitude or behavior (Jacobs, 2016; Ruggiero & Becker, 2015; Steinemann et al., 2015). It is possible that, if the choices had resulted in more dire consequences, participants may have been emotionally moved and provoked into thinking more on homelessness. An interesting approach for future research could be to more closely investigate whether difficult decisions with harsh consequences would lead to a greater gain in learning, and consequentially improve attitude and change behavior for the better akin to previous suggestions (Kampf & Stolero, 2015; Zahn et al., 2014). The question however remains what characteristics would make a choice powerful enough to impact players' perception, emotion and cognition in a meaningful way. This led to the second overall research question, which is reflected on next.

Choice Characteristics and Appreciation (Question 2)

As a direct follow-up on a deeper understanding when choices may or may not lead to appreciation, the second manuscript used a mixed-method approach to look at the characteristics of meaningful choices, as defined by players in open answers. A first empirical investigation (study 1 of 'Manuscript 2') revealed that meaningful choices were mainly associated with moral and social encounters, having consequences which were often crucial for the game narrative or even game outcome. Based on these findings, narrative choice characteristics were implemented and investigated in a quantitative experiment (study 2 of 'Manuscript 2'). These characteristics of the high-meaningful narrative lead to a better evaluation of the narrative concerning appreciation. While there was no main effect of making choices onto appreciation, planned contrast analyses revealed that participants appreciated the high-meaningful narrative the most, when they could make the highly meaningful choice themselves. Hence, actively participating in the decision making process may also have added to the evaluation of the narrative as being meaningful.

According to previous assumptions, interactivity has the ability to let people engage actively and experience the consequences more deeply (Elson et al., 2014;

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Green, Brock, & Kaufman, 2004; Hand & Varan, 2007). Overall, the effect of interactivity on appreciation was limited to the high-meaningful condition and there was no main effect on enjoyment nor on narrative engagement. While the null effect of interactivity onto engagement corresponds to the small and sometimes insignificant effects of narrative interactivity on a related concept of engagement (i.e., transportation) (Green & Jenkins, 2014; Jenkins, 2014), it also provides a further important insight. Implementing only one narrative choice with meaningful characteristics was not enough to influence narrative engagement, but was still enough to impact the evaluation of appreciation. While narrative engagement was correlated with appreciation, it is possible that a longer exposure time with more choices may lead to greater effect on both experiences.

These findings can help to explain why interactivity as making choices in narratives sometimes does and at other times does not lead to the experience of appreciation. In the studies not finding an effect of making choices onto appreciation, the provided options were not always related to dire consequences, and morally and socially relevant encounters (Manuscript 1; Shafer et al., 2016). Therefore, for the choice options to be powerful enough to affect the experience of appreciation, they may have to be related to all of these three characteristics. Nonetheless, our results only support that making meaningful choices worked in affecting appreciation for this specific interactive narrative. In a next step, research could investigate how these characteristics should be implemented in the context of other games and narratives. Perhaps it is also important to investigate how participants psychologically process these characteristics in respect to other processes than appreciation. For instance, it is possible that of more importance than the consequence itself, is how players perceive their selected option impacts what will happen next (Nay & Zagal, 2017). As we did not find a differing effect of the outcome within the meaningful conditions, perhaps what the outcome entails does not matter, but rather the perception or the expectation of it.

Reward as a Consequence of an In-Game Choice (Question 3)

While the findings of the previous manuscripts focused on interactive narratives and narrative-rich games, adding elements that are more related to the *mechanics* of a game has been discussed to equally affect players meaningfully (Salen & Zimmerman, 2004). In addition, serious games focusing on the mechanic were found to be as effective as games focusing on the narrative in improving attitudes

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of socially relevant issues (Jacobs, 2017). Certain rewards may be more related to the mechanics of a game (Phillips et al., 2013) than the narrative, but may as well influence how the outcome of the game is perceived, which has been discussed to affect how players think morally and prosocially about their actions in the game or in the game community (Heron & Belford, 2014; Kou et al., 2017; Murphy & Zagal, 2011; Sicart, 2009). Therefore, another element that the second study in the third manuscript contributed to, is the mechanic element of a weapon as a reward for certain game play.

As reward has not been investigated in games research relating to real-life prosocial behavior, the studies in ‘Manuscript 3’ focused on reward following an in-game choice to help in a violent video game context. The first study of this investigation supports that helping in-game positively affected real-life prosocial behavior, finding that players acted in line with moral consistency (Mullen & Monin, 2016), while also supporting previous game studies finding a consistent effect corroborating with Greitemeyer and Mügge (2014). However, as an exploratory finding indicated that the consequential expectation of reward may be negatively related to prosocial behavior in real life, the second study varied this choice consequence in that some of the helpful players received a facilitating weapon as reward. Together with the findings of ‘Manuscript 1’ and ‘Manuscript 2’ these results add to the discourse on when media and games do affect real-life prosocial behavior and when not (Coyne et al., 2018; Greitemeyer & Mügge, 2014; Joeckel & Dogruel, 2016; Ruggiero, 2015), in that reward could moderate the effect of game content onto real-life prosocial behavior (donation), as it was most likely when there was no reward. Qualitative findings on the reasons behind the in-game helping decision, as either moral or strategic, indicate a possible reason for this effect. According to our thematic analysis, the helping decision was more likely to be related to strategical motives when there was a reward, which was underlined by perceiving oneself as less prosocial, when compared to the helping group who did not receive a reward. As the prosocial self-concept only served as a manipulation-check and was only related to their in-game behavior, we do not know whether play experiences, such as appreciation or narrative engagement, were affected. Future studies ought to investigate the effect on play experience and post-game behavior, by manipulating narrative and mechanic consequences such as other kinds of rewards (mechanic) or the reveal of the goodness or badness of the character in need (narrative).

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The Potential of Media to Affect Appreciation and Prosocial Behavior – A Comparison of the Empirical Findings

In comparison to the interactive narratives in ‘Manuscript 1’ and ‘Manuscript 2’, and the previous successful serious game studies (Jacobs, 2016; Peng et al., 2010; Steinemann et al., 2015), the first-person-shooter game of ‘Manuscript 3’ did not explicitly contain an overall prosocial or socio-political message. Nevertheless, the decision to help and the consequence of not providing a weapon as reward for help had a positive effect on prosocial behavior in real life. Hence, this opens the question of why in this experiment an overall prosocial media message was not required to induce a positive effect on prosociality in real life. Perhaps the answer is whether participants focused on others versus their own needs during playing. The consequence of getting a reward served the player insofar as to be able to finish the game more quickly. Instead, when helping without a reward, players may have focused more on caring for a vulnerable character. As this in-game behavior was empirically associated with the way players reasoned their in-game behavior, it was also associated with prosociality in real life. In sum, this shift of the focus from the self to another person may benefit the transfer from game to real life. That in-game behavior can transfer to behavior in real life corroborates the suggestions that the line between games and the real life may be porous, because media characters are often similarly treated as persons in real-life relationships (Krcmar & Cingel, 2016; Weaver & Lewis, 2012; Wehbe et al., 2017).

Another difference between the here presented studies is, although reward was a consequence, that we did not observe whether players getting no reward for help experienced the game as specifically meaningful. We did however observe different reasoning patterns (moral and strategic) similar to the findings of Krcmar and Cingel (2016). As the reasoning patterns were also related to the prosocial behavior in real life in ‘Manuscript 3’, and as moral reasonings was associated with higher appreciation in ‘Manuscript 2’, it may prove promising to look at different moral reasoning patterns in future research to further the understanding of positive and serious effects of interactive media, such as games, onto player experience and real-life behavior.

The first study (Manuscript 1) did not find an effect of interactivity, as choices being made, on appreciation nor donations. The narrative also did not contain highly consequential decisions or decisions with moral dilemmas. Furthermore, the

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narrative outcome was positive, as the family found a place to stay in the end. In comparison, the game used in ‘Manuscript 3’ contained a decision with a small consequence (i.e. praise for help, reward) that lead to moral reasonings for some players and also lead to higher donations compared to those not reasoning morally. It is possible that getting no advantageous weapon also made gameplay more costly in terms of health and time. As such sacrifices are usually associated with the concept of prosocial behavior (Batson & Powell, 2003), perhaps the players perceived the game outcome as more prosocial than with players getting a reward. Finally, the second study of ‘Manuscript 2’ only found an effect of making choices on appreciation, if three characteristics were given: moral, social and consequential. Perhaps for an effect on play experience, and with it a stronger effect on behavior, all the choice characteristics might have to be present. To positively affect play experience and further social change, we suggest to further investigate these meaningful choice characteristics and what game design manipulations beside narrative choices have a similar or higher impact.

Conclusion and Further Research

First, some of the variance in the results of all three studies is defined by the predisposition that participants bring with them into the interaction with the game and the narrative, such as care morality and empathic concern. Joeckel and Dogruel (2016) similarly assume that a user’s inherent morality and empathic concerns are not separable from the effects that media may have on their users. While in most of the here presented studies the influence of these person-related variables were controlled for, the potential influence should further be looked at. For instance, in study 2 of the second manuscript, care morality was correlated with appreciation. Furthermore, empathic concern (measured before the interaction with the game) was correlated with prosocial self-concept (measured post-game) in the last study (‘Manuscript 3’). Hence, future research could further control for the personal predispositions by using these subjective measures (Davis, 1983; Haidt & Joseph, 2007) and investigate how they relate to meaningful experiences and prosocial behaviors following the exposure to narratives and games.

Second, for future research we see a great potential in including qualitative approaches to improve the understanding of how participants experience choices within the interaction with media. This may provide more insights on the variety of potential experiences and the reasons behind behaviors people show during as well

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as after interacting with media. In ‘Manuscript 2’ for instance, though not a main theme, some decisions of the narrative-rich games were associated with intense emotional states such as frustration (Harry Potter) or suspense (PUBG), which could have made the experienced choices challenging, thereby making the consequences important within the decision process. These challenging circumstances might sufficiently underline the severity of the choice, so that the choice has the potential to change behavior as discussed in ‘Manuscript 1’.

Third, we could show that helping in a game led to a greater likelihood of moral reasoning of in-game behavior and prosocial behavior in real-life, and that making narrative choices can lead to a higher appreciation. In respect to these findings, choice consequences played a crucial role, which is in line with the important consequences experienced in successful serious games such as *Darfur is Dying* (Peng et al., 2010), *Spent* (Ruggiero, 2015) or *My Cotton Picking Life* (Jacobs, 2016). Future research could investigate whether more dire consequences increase the efficacy of such games on the experience of appreciation and prosocial behavior as a result of a stronger social message.

Fourth, according to the first study (Manuscript 1), being able to make choices in the interactive narrative led to higher responsibility felt for the choices compared to the version where participants were not able to choose. This corresponds to previous findings and theoretical assumptions (Green & Jenkins, 2014). In our study however, responsibility was not strong enough to lead to prosocial behavior. But as feeling responsible has been found to be related to empathy (Čehajić et al., 2009), and similar relations to moral disengagement have been found in video games (Hartmann & Vorderer, 2010), further investigating the potential of meaningful choices, made in games, narratives or movies, so as to evoke responsibility related to prosocial thoughts, may also prove interesting for real-life prosocial behavior.

Last but not least, an important takeaway of this thesis is that choices made in an interactive media context, such as a narrative or a game, can shape people’s perceptual, emotional and cognitive processes in regards to the potential consequence of the decision, fostering the media evaluation as meaningful or even affecting real-life prosocial behavior. Knowing that choices can affect how players perceive, think, feel and behave after such an interactive event, hints to the entertainment design possibilities with respect to the use of morally and socially relevant choices and their consequences within video games.

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Statement of Authorship

- i I, Glena H. Iten, hereby declare that I have written the submitted doctoral thesis “Understanding the Impact of In-Game Choices on the Experience of Appreciation and Real-Life Prosocial Behavior” without any assistance from third parties not indicated.
- ii I only used the resources indicated.
- iii I marked all citations.
- iv My cumulative dissertation is based on three manuscripts. The first has already been published. The second manuscript is in press and the third manuscript is submitted. I certify here that the articles in this dissertation concern original work. I contributed substantially to all manuscripts in this dissertation and I have been jointly responsible for the idea, conception, methodological design, data collection, analyses, and writing of all manuscripts. This characterization of my contributions is in agreement with my co-authors’ views.

Place and Date: _____

Glena H. Iten: _____

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Appendix

1. Steinemann, S. T., Iten, G. H., Opwis, K., Forde, S. F., Frasseck, L., & Mekler, E. D. (2017). Interactive Narratives Affecting Social Change. *Journal of Media Psychology*. doi: <https://doi.org/10.1027/1864-1105/a000211>
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Interactive Narratives Affecting Social Change

A Closer Look at the Relationship Between Interactivity and Prosocial Behavior

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Abstract: Interactive narratives offer interesting opportunities for the study of the impact of media on behavior. A growing amount of research on games advocating social change, including those focusing on interactive narratives, has highlighted their potential for attitudinal and behavioral impact. In this study, we examine the relationship between interactivity and prosocial behavior, as well as potential underlying processes. A yoked study design with 634 participants compared an interactive with a noninteractive narrative. Structural equation modeling revealed no significant differences in prosocial behavior between the interactive and noninteractive condition. However, support for the importance of appreciation for and engagement with a narrative on subsequent prosocial behavior was observed. In summary, while results shed light on processes underlying the relationship between both noninteractive and interactive narratives and prosocial behavior, they also highlight interactivity as a multifaceted concept worth examining in further detail.

Keywords: prosocial behavior, interactive narrative, appreciation, games for change, yoked design

A growing amount of research supports the idea that interactive narratives and games can be used not only for entertainment but also for education, health, and to further social change and prosocial behavior (Green & Jenkins, 2014; Steinemann, Mekler, & Opwis, 2015). Games for change are designed to motivate their players to support the social change they themselves are advocating. They have been created on a wide variety of subjects from the humanitarian crisis in Darfur (*Darfur Is Dying*), to the working poor in the United States (*Spent*), to the social status of women around the world (*Half the Sky*).

In recent years, studies have provided empirical support for the potential of interactive media to improve attitudes toward stigmatized groups (Ruggiero, 2015), increase willingness to help (Peng, Lee, & Heeter, 2010), and impart knowledge around peace efforts among people living in conflict zones (Kampf & Stoloro, 2015). Notably, however, to our knowledge only one study to date has examined the effect of games for change on actual behavior. In that study, Steinemann et al. (2015) compared a game where the player takes the role of a refugee in Darfur, with an interactive text, a noninteractive text, and a video, all telling the same story as the game. After engaging with the story,

participants were asked whether they would be willing to donate a percentage of a monetary reward they were receiving to a charity helping refugees in Darfur. The study found that participants in the interactive conditions (i.e., the interactive text and the game) donated significantly more than participants in the noninteractive conditions.

Understanding the impact that interactive media, such as games for change, can have on behavior, and specifically on prosocial behavior, is a highly interesting topic, both from an academic perspective (Ruggiero, 2015; Sundar, 2009) as well as from a practical perspective, as affecting behavior is arguably a crucial goal of games for change (Klimmt, 2009). In light of this first empirical support that games for change can indeed lead to prosocial behavior, the following sections will outline possible foundations for this effect.

Theoretical Background

Interactivity

Games for change vary widely in their visual presentation, use of game features, and narrative structure. What they

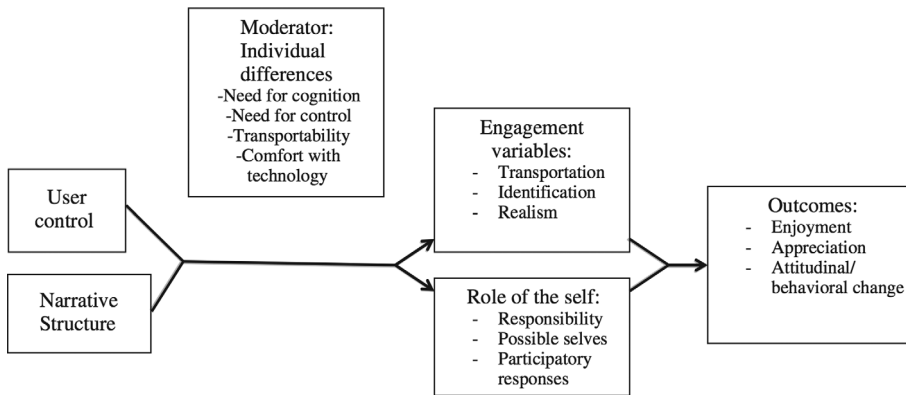


Figure 1. The conceptual model of the processes and outcomes of interactivity as proposed by Green and Jenkins (2014).

have in common, however, is that each game puts players in a role they would most likely never encounter in their day-to-day life, has them make decisions in this role, and experience their narrative consequences (Green & Jenkins, 2014). This taking of an active role in the narrative is referred to as *interactivity* (Green & Jenkins, 2014).

While an exact definition of interactivity is hampered by the fact that different forms of media will exhibit interactivity in a wide variety of ways (Bucy & Tao, 2007; Sundar, 2009), especially for narrative-heavy games, their ability to allow decision-making is arguably one of interactivity's most basic and defining features (Elson, Breuer, Ivory, & Quandt, 2014; Green & Jenkins, 2014).

Different studies have highlighted the importance of interactivity as crucial to the impact of games for change (Peng et al., 2010; Ruggiero, 2015; Steinemann et al., 2015). Notably, Steinemann et al. (2015) found an interactive text to be just as effective at increasing donations as an animated game. This finding lends credence to interactive texts as a valuable form of game for change. Indeed, several games for change already exist, which either are designed as interactive texts or rely heavily on interactive text as a primary game feature (e.g., *Spent*, *Depression Quest*, or *NationStates*). In this study, we therefore focus on interactivity in text-based narratives, as referring to decisions guiding the narrative, as opposed to, for example, dexterity-based interactivity possible in digital games.

Beyond empirically demonstrating the importance of interactivity to affect behavior, it is necessary to further understand the psychological processes that mediate this effect (Bucy & Tao, 2007). In the study by Steinemann et al. (2015), for instance, the effect of interactivity on donating behavior was mediated by appreciation.

Yet none of the other examined factors, which included willingness to help and enjoyment, were both impacted by interactivity and positively related to donating. The aim of this study therefore is to more closely examine the relationship between interactivity and prosocial behavior.

Hence, we refer to the theoretical model of Green and Jenkins (2014), which discusses a number of variables that may help to explain the processes involved in the effects of interactive narratives on outcomes such as behavior (see Figure 1). In this model, interactivity leads to behavioral change by giving the reader control and allowing them to adapt the narrative structure (i.e., the course of the story) according to their individual personality and interests. This in turn leads to engagement (which includes factors such as identification) and allows the reader to play with different roles of the self, for example, by an increased sense of responsibility toward the characters in the interactive narrative or by exploring different aspects of their personality through possible selves presented in the narrative. Together, these variables are expected to impact outcomes such as enjoyment, appreciation, and attitudinal and behavioral change.

The current study aims to empirically examine some of these processes. We focus on variables that may be of particular interest when attempting to explain the impact of interactivity on prosocial behavior as the outcome.

Prosocial Behavior

While there is still little research specifically about the impact of games for change on actual behavior, the study by Steinemann et al. (2015) gives a first indication for such an effect, and interactivity as its source. While prosocial behavior can manifest itself in countless ways, in the study by Steinemann et al. (2015) prosocial behavior was instrumentalized as the percentage that, after engaging with a narrative, participants donated to a charity helping people like the main character in the narrative. Based on these results, combined with the findings of other studies that link interactive media with increased prosocial attitudes and behaviors (Green & Jenkins, 2014; Ruggiero, 2015), we hypothesize that:

Hypothesis 1 (H1): Interactivity will lead to a higher percentage donated.

Identification

In the context of media, identification describes the process of taking on the role of a character and sharing their goals and emotions (Cohen, 2001). In contrast to engagement with the narrative world, identification describes the merging with a character (Green & Jenkins, 2014). This merging with a character is facilitated by interactivity, as interactivity allows the player to choose actions for the character, which they personally agree with (Vorderer, Knobloch, & Schramm, 2001).

According to social identity theory, identification is crucial in the categorization of in- and outgroups, creating the line between people an individual will consider to be like themselves and treat more favorably and those they will not (Hogg, 2003). Identification has its basis in empathy, itself a well-established predecessor of prosocial behavior (Eisenberg & Miller, 1987). In the context of games for change, increased identification has been associated with higher willingness to help (Peng et al., 2010) and donating behavior (Steinemann et al., 2015).

We therefore hypothesize that:

Hypothesis 2 (H2): Interactivity will lead to more identification with the character.

Hypothesis 3 (H3): Identification will be positively related to a higher percentage donated.

Responsibility

As argued by Green and Jenkins (2014), while empathy with a character may occur in noninteractive narratives, feeling responsible for their actions is rare. By making decisions in the interactive narrative, however, the reader can see a direct link between their actions and their consequences. Through this sense of agency over the narrative, the likelihood of feeling responsible for the outcome and how it affects the main character increases (Green & Jenkins, 2014). A lack of agency has been associated with an increase in moral disengagement, which in turn is related to a decrease in prosocial behavior (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996). Alternately, priming participants on their responsibility can increase empathy, which is related to prosocial behavior (Čehajić, Brown, & González, 2009). While there are no studies directly linking responsibility with prosocial behavior in interactive narratives, on the basis of these findings we hypothesize that:

Hypothesis 4 (H4): Interactivity will lead to more responsibility.

Hypothesis 5 (H5): Responsibility will be positively related to a higher percentage donated.

Appreciation

Finally, appreciation describes media experiences that are valued not necessarily for being fun but for their capability to be meaningful, moving, and thought-provoking (Oliver & Bartsch, 2010); such as when the player's character has to make a hard choice in the narrative.

While games research has long focused primarily on enjoyment, recent studies have highlighted the ability of games to lead to meaningful experiences (Elson et al., 2014; Oliver et al., 2015; Steinemann et al., 2015). A possible explanation for this effect is that interactivity may allow players to create a story that is more personally meaningful to them than a noninteractive equivalent (Elson et al., 2014).

Both feelings of meaningfulness as well as the ability of media to be moving have been repeatedly associated with increased likelihood of compassion and prosocial behavior (Morgan, Movius, & Cody, 2009; Myrick & Oliver, 2015; Small & Simonsohn, 2008). Furthermore, in the study by Steinemann et al. (2015) appreciation was not only higher in the interactive condition, it was also positively related to an increase in donations.

In the conceptual model of Green and Jenkins (2014), appreciation is an outcome, similar to behavior. However, as behavior is the focus of this study and because of the aforementioned research linking appreciation with both interactivity and prosocial behavior, we will treat appreciation as an additional process between interactivity and prosocial behavior (see Figure 2).

We therefore expect that:

Hypothesis 6 (H6): Interactivity will lead to more appreciation.

Hypothesis 7 (H7): Appreciation will be positively related to a higher percentage donated.

While identification, responsibility, and appreciation offer the clearest indications for their role as mediators between interactivity and prosocial behavior, other variables should also be considered in a comprehensive model of these processes. Therefore, we also controlled for the role of three additional variables. To control for individual differences in empathy, which may particularly impact identification, empathic concern was included (Cohen, 2001). Additionally, enjoyment, which is related to appreciation (Oliver & Bartsch, 2010), and narrative engagement (Busselle & Bilandzic, 2009), which may be related to all three potential mediators, was controlled for (see Figure 2).

To sum up, the goal of this study was to examine how an interactive narrative, compared with a noninteractive narrative, impacts prosocial behavior, identification with the character, responsibility toward the character, and

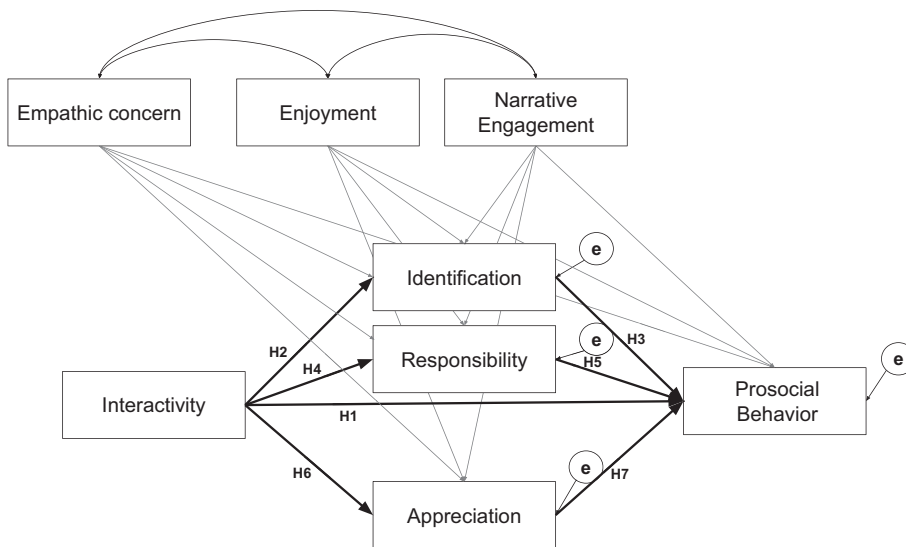


Figure 2. A model of the expected processes between interactivity and prosocial behavior. Lines in bold indicate hypotheses-relevant pathways.

appreciation of the narrative experience. Furthermore, we examined how these different variables in turn relate to prosocial behavior (see Figure 2). Thereby, the results offer a closer empirical examination of the theoretical model of Green and Jenkins (2014), as well as allowing a more sophisticated look at the relationship between interactivity and prosocial behavior.

Method

Ethics Statement

This research was registered with the Institutional Review Board of the authors' university. Written informed consent was obtained from all participants.

Design

To test our hypotheses, a between-subject experimental design was utilized. The independent variable was interactivity (interactive, noninteractive). The primary dependent variable was prosocial behavior, measured as the percentage of the reward that participants donated at the end of the study. The further dependent variables – expected to mediate the relationship between interactivity and prosocial behavior – were identification, responsibility, and appreciation. Empathic concern, enjoyment, and narrative engagement were added to the model as control variables.

An additional variable, text comprehension, served as a quality check and was analyzed across groups prior to testing the model, to ensure that interactivity did not affect participants' ability to understand the text.

Participants

To achieve an acceptable power for the specified model (see Figure 2), a sample of 580 was needed. To ensure we would conclude with a sufficient sample size, we aimed to recruit approximately 730 participants on the crowdsourcing platform CrowdFlower (<http://www.crowdfunder.com>).¹ As recruitment over this platform was slow, Mechanical Turk was also included (<https://www.mturk.com/mturk/>).²

In all, 854 participants finished the study, of whom 796 correctly answered a bogus item (“This is a control item, please select ‘completely disagree’”). To ensure data quality, an additional 162 participants were subsequently excluded, due to technical issues ($n = 7$), outliers (± 3.00 SD) in completion time ($n = 81$), indicating that they had not carefully answered the study questions ($n = 9$), participating more than once ($n = 25$), and answering less than three out of six of the text comprehension questions correctly ($n = 40$). The final dataset consisted of a total sample of 634 participants (331 in the interactive, 303 in the noninteractive condition).

To ensure the samples collected on Mechanical Turk ($n = 270$) and CrowdFlower ($n = 363$) did not differ significantly in terms of the impact of interactivity on the

¹ Recruitment on CrowdFlower took place from June 2, 2016, to July 13, 2016.

² Recruitment on Mechanical Turk took place from July 8, 2016, to July 12, 2016.

dependent variables, a two-way multivariate analysis of variance (MANOVA) was conducted to examine the combined effects of platform and condition on identification, responsibility, appreciation, and donation. A significant main effect for condition was found ($p < .001$), but neither the main effect for platform, nor the interaction effect between platform and condition reached significance (p -values between .53 and .97). Therefore the two samples did not differ in terms of hypothesis-relevant effects.

To examine whether text comprehension differed between the interactive ($M = 5.27$, $SD = 0.62$) and noninteractive condition ($M = 5.25$, $SD = 0.93$), Welch's two-sample t test was conducted. No significant difference was found ($p = .419$).

As good English skills were essential for understanding the questionnaires and the stimulus material, we restricted recruitment to countries with English as a primary language. The majority of participants reported their nationality as US American ($n = 301$), Canadian ($n = 106$), or British ($n = 96$), with the remaining 131 reporting one of 31 other nationalities. Of the participants, 381 identified as female, 245 as male, three as transgender or non-binary, and four preferred not to say. Participants reported a wide variety of employment types, the largest groups being professional or managerial ($n = 268$), unemployed ($n = 111$), student ($n = 91$), blue collar or service ($n = 80$), and self-employed ($n = 84$).

Participants received US \$0.2 for their participation, which they received after entering a code on CrowdFlower or Mechanical Turk that they were awarded at the end of the study. In addition, they received a reward of up to US \$1 for carefully filling out the questionnaires and open questions, with respect to the aforementioned data quality checks. A percentage between 0% and 100% of this reward could be donated and served as our measure of prosocial behavior.

Stimuli

An interactive and a noninteractive version of a narrative were created using the authors' university webserver. Both versions contained the same story, told over 23 paragraphs. The text was based on the article "How I Became Homeless" (Marcus, 2014, December), which tells the story of how a single parent with three children becomes unexpectedly homeless and the struggles they face while trying to find a place to stay.

For the interactive condition, eight decisions were added (e.g., opening a letter immediately or waiting until the evening) and the original article's text was slightly modified (e.g., sentences were added in order to include the

decisions). These decisions were designed to feel impactful, but at the same time to have a minimal impact on the narrative (e.g., choosing to open a letter a day later would lead to losing 1 day out of 4 for packing, but had no further impact on the story). However, to further ensure that the content of the specific decisions would not confound the effect of interactivity on our dependent variables, a yoked design was used. Therein, every time a participant in the interactive condition finished their version of the story based on their decisions, this version was saved and given to a participant in the noninteractive condition. This meant that the story was presented in as many different versions in the noninteractive condition as in the interactive condition. This "yoking" of the story version presented across conditions insured any differences between the two groups would be due to interactivity and not due to differences in the story or information presented.

The yoked design was implemented using Storyboard (Version 0.1), a software developed by the fifth author. The software utilizes a MySQL database and the PHP programming language. User interactions were recorded in our user tracking solution Datamice (Version 0.4) that was implemented with jQuery, PHP, Zend Framework, and MySQL.

An example of a noninteractive version of the story and the interactive story, as well as the code for the yoked design, can be viewed on the Open Science Framework website.³

Measures

Donating Behavior

Donating behavior was measured by asking participants which percentage of their participation reward they wished to donate to a charity. The charity chosen for this study was Habitat for Humanity, a nonprofit organization that aims to build and rehabilitate affordable houses around the world so as to help eliminate homelessness (<http://www.habitat.org/>). Participants chose the amount to donate from a drop-down list of ten-percent increments from 0% (no donation) to 100% (complete donation). This method was a slightly modified version of the method used by Steinemann et al. (2015), which informed participants of their reward in advance (instead of it being an unexpected bonus). This was done to increase the likelihood that participants would treat this money as their own (Clark, 2002). While US \$1 was a fairly small amount of money, several previous studies have utilized this or similarly small amounts to examine donating behavior (e.g., Steinemann et al., 2015; Tsvetkova, Macy, & Szolnoki, 2014).

³ Our project InteractiveNarratives can be accessed at <https://osf.io/jstzv/>

Responsibility

To measure responsibility, the 2-item scale by Jenkins (2014) was used (Cronbach's $\alpha = .95$), which asks participants to which extent they feel responsible for the outcome of the story and the character's decisions.

All items for this and all following measures were presented on a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*).

Identification With the Character and Empathic Concern

The 10-item identification scale by Cohen (2001) was used to measure identification with the main character (Cronbach's $\alpha = .92$). The items for this as well as all following measures were modified to be applicable for both interactive and noninteractive narratives. To control for individual differences in empathy, the 7-item Empathic Concern subscale by Davis (1983) was used (Cronbach's $\alpha = .87$).

Appreciation and Enjoyment

Appreciation (Cronbach's $\alpha = .88$) and enjoyment (Cronbach's $\alpha = .89$) were measured using the scale developed by Oliver and Bartsch (2010). This scale contains three items each for appreciation, that is, how meaningful, moving, and thought-provoking the story was, and enjoyment, that is, to which extent reading through the story was fun, considered a good time, and entertaining.

Narrative Engagement

To control for narrative engagement, the 12-item scale for narrative engagement developed by Busselle and Bilandzic (2009) was used (Cronbach's $\alpha = .85$).

Text Comprehension

Based on the questionnaire originally developed for viewing comprehension by Hobbs and Frost (2003), a 6-item questionnaire was included to control for text comprehension. While the original questionnaire asked for open answers, considering our large sample size a multiple-choice format was used.

Procedure

After clicking on a link on CrowdFlower or Mechanical Turk, participants were informed on an introduction page of the approximate time that the study would take and that they would be receiving a US \$1 reward for careful completion of the study, next to the upfront payment of US \$0.2. Next, participants were asked to fill out the

questionnaire for empathic concern. Following this, participants were randomly assigned to one of the experimental conditions. Afterward, participants were asked to fill out the identification, responsibility, appreciation, enjoyment, and narrative engagement questionnaires. Next, participants were thanked and told that they now had the opportunity to donate a percentage of their US \$1 reward to a charity. The percentage they chose to keep for themselves was later given to them as a bonus on CrowdFlower or Mechanical Turk; the percentage they wished to have donated was donated to the charity. Finally, participants were asked to fill out the text comprehension questionnaire and demographic questions (including a 1-item question on whether they had experienced circumstances similar to the ones described in the narrative), thanked a second time, and given a code to enter on their respective crowdsourcing platform in order to receive their compensation and reward.⁴

Results

The dataset and R script used in this analysis can be found on the Open Science Framework.⁵

Preliminary Analysis

Using boxplots, univariate outliers were detected for empathic concern, narrative engagement, identification, and appreciation. These variables were subsequently winsorized (threshold: 95%) to minimize the influence of the outliers on the statistical estimates.

Inspecting normal Q-Q plots, the distributions of donation and responsibility were found to be substantially non-normally distributed. Additionally, inspection of the scatterplots of the standardized residuals against the standardized predicted scores indicated the presence of heteroscedasticity among residuals, likely due to the non-normal distribution of donation and responsibility (Kline, 2011). Therefore, subsequent analyses were conducted using bootstrapping and Spearman's rank correlation, as they are robust to violations of normality. Examination of the scatterplots indicated that all visible relations between the outcome variables were linear.

Means and standard deviations for all dependent and control variables across the two levels of interactivity are listed in Table 1. Participants in both conditions donated approximately 30% of their reward to the charity, which

⁴ In order to donate and pay out the correct amounts to participants, participants received different codes depending on the amount they had chosen to donate.

⁵ InteractiveNarratives (<https://osf.io/jstzv/>)

Table 1. Descriptive statistics: means and standard deviations by condition

Variable	Noninteractive Narrative	Interactive Narrative
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
Percentage Donated	29.47 (37.35)	31.21 (38.10)
Responsibility	2.22 (1.48)	3.09 (1.83)
Identification	5.58 (0.94)	5.57 (0.94)
Appreciation	5.85 (0.95)	5.81 (0.97)
Empathic Concern	5.21 (1.02)	5.24 (1.05)
Enjoyment	4.46 (1.46)	4.69 (1.60)
Narrative Engagement	5.28 (0.91)	5.31 (0.90)

resulted in a total donation of US \$214 for Habitat for Humanity. Further, the high values for identification and appreciation indicated that in both conditions, participants identified strongly with the character and found the story to be meaningful. Spearman's rank correlations are listed in Table 2. Of special note are the high correlations between appreciation, identification, and narrative engagement, contrasted with the fairly low correlations with donation.

Model Estimation

To test H1-H7 (Figure 2), a path analysis model was estimated with R (R Core Team, 2016) and the package lavaan (Rosseel, 2012), using standard error-bootstrapping and Satorra-Bentler correction due to non-normality (Kline, 2011).

Inspection of the fit indices showed the resulting model to have a good fit, $\chi^2 = 3.68$, $df = 3$, $p = .299$, comparative fit index (CFI) = .99, root mean square of approximation (RMSEA) = .02, 90% CI [.00, .07]. This model can be seen in Figure 3.

Next, the importance of the control variables empathic concern, enjoyment, and narrative engagement was examined by trimming the paths between them and the dependent variables. A χ^2 difference test determined that the trimming of these paths resulted in a significantly poorer fit ($\chi^2_{diff} = 927$, $df_{diff} = 15$, $p < .001$). Therefore, the original model was retained.

Despite the high covariance between identification, appreciation, and narrative engagement, multicollinearity was within acceptable ranges (VIF between 2.40 and 3.14, tolerance values between .32 and .42; Field, Miles, & Field, 2013).

Confirmatory Analysis

Hypotheses were tested using the estimated model (Figure 3). Our first hypothesis predicted that interactivity

would lead to a higher percentage donated. This was not supported ($\beta = .02$, $b = 0.01$, $SE = 0.03$, $p = .696$). H2 and H3 predicted that interactivity would lead to more identification, which in turn would lead to a higher percentage donated. H2 was not supported ($\beta = -.03$, $b = -0.06$, $SE = 0.05$, $p = .169$), whereas for H3 a significant relationship in the opposite direction was found, with identification being negatively related to percentage donated ($\beta = -.17$, $b = -0.07$, $SE = 0.03$, $p = .013$). H4 and H5 predicted that interactivity would lead to more responsibility, which in turn would be related to a higher percentage donated.

H4 was supported ($\beta = .23$, $b = 0.80$, $SE = 0.12$, $p < .001$), while H5 was not ($\beta = .08$, $b = 0.02$, $SE = 0.01$, $p = .08$). H6 and H7 predicted that interactivity would lead to more appreciation, which in turn would be related to a higher percentage donated. H6 was not supported ($\beta = -.05$, $b = -0.10$, $SE = 0.05$, $p = .056$); however, H7 was supported ($\beta = .17$, $b = 0.07$, $SE = 0.02$, $p = .005$). An overview of all hypotheses and corresponding results can be seen in Table 3.

Exploratory Analysis

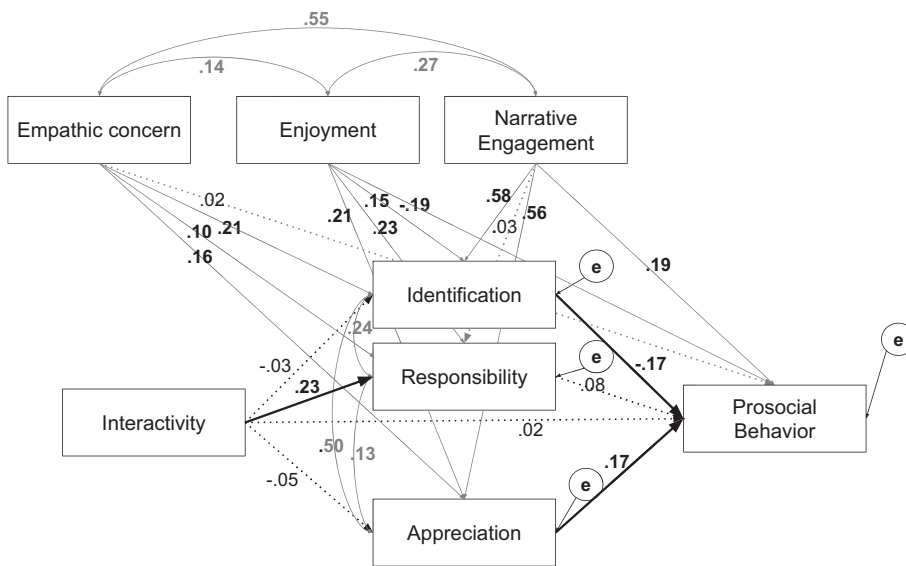
As 148 participants (23.30% of the study sample) indicated that they had themselves experienced circumstances similar to the ones described in the narrative, we added "experienced similar circumstances" (*yes/no*) as a further control variable into the model, as this may have simultaneously facilitated identification with the character in the story, while also making participants less likely to donate as they might still be in more difficult financial circumstances than someone who had never experienced similar circumstances. The resulting model had a good fit, $\chi^2 = 3.82$, $df = 4$, $p = .431$, CFI = 1.00, RMSEA = .00, 90% CI [.00, .06]. Of particular interest is the finding that the previously negative relationship between identification and donation was no longer significant in this model ($\beta = -.12$, $b = -0.05$, $SE = 0.03$, $p = .112$), but that instead having experienced similar circumstances was significantly negatively related to donation ($\beta = -.13$, $b = -0.11$, $SE = 0.03$, $p = .001$).

To further improve the model, the nonsignificant paths between experienced similar circumstances and appreciation and responsibility as well as the nonsignificant covariance between experienced similar circumstances and enjoyment were trimmed. A χ^2 difference test showed this to not significantly reduce the model fit ($\chi^2 = 3.33$, $df_{diff} = 3$, $p = .34$). Next, the nonsignificant paths from interactivity to identification, appreciation, and donation as well as the nonsignificant paths from identification to donation, responsibility to donation, empathic concern to donation, and narrative engagement to responsibility were trimmed. A χ^2 difference test showed this trimming to likewise not

Table 2. Spearman's rank-order correlations between Empathic Concern, Narrative Engagement, Enjoyment, Appreciation, Identification, Responsibility and Percentage Donated

Variables	Empathic Concern	Narrative Engagement	Enjoyment	Appreciation	Identification	Responsibility
Narrative Engagement	.53***					
Enjoyment	.14***	.26***				
Appreciation	.49***	.69***	.39***			
Identification	.55***	.73***	.33***	.77***		
Responsibility	.11**	.13***	.25***	.20***	.25***	
Donation	.11**	.19***	-.09*	.15***	.10**	.08*

Note. * $p < .05$; ** $p < .01$; *** $p < .001$.

**Figure 3.** Structural equation model of the processes between interactivity and prosocial behavior examined in the confirmatory analysis including standardized estimates of direct effects. Dotted lines indicate nonsignificant pathways.

significantly reduce the model fit ($\chi^2 = 12.7$, $df_{diff} = 10$, $p = .239$).

The resulting model fit was good, $\chi^2 = 16.60$, $df = 14$, $p = .278$, CFI = 0.998, RMSEA = .02, 90% CI [.00, .04]. This exploratory model can be seen in Figure 4.⁶

Discussion

This study aimed to investigate how and why interactive narratives may impact prosocial behavior. Of the variables examined, responsibility alone was impacted by interactivity. Prosocial behavior was positively related to appreciation and narrative engagement and negatively related to enjoyment, and (in the confirmatory analysis) with identification. Responsibility and empathic concern

were not significantly related to prosocial behavior. Narrative engagement was strongly related to both identification and appreciation.

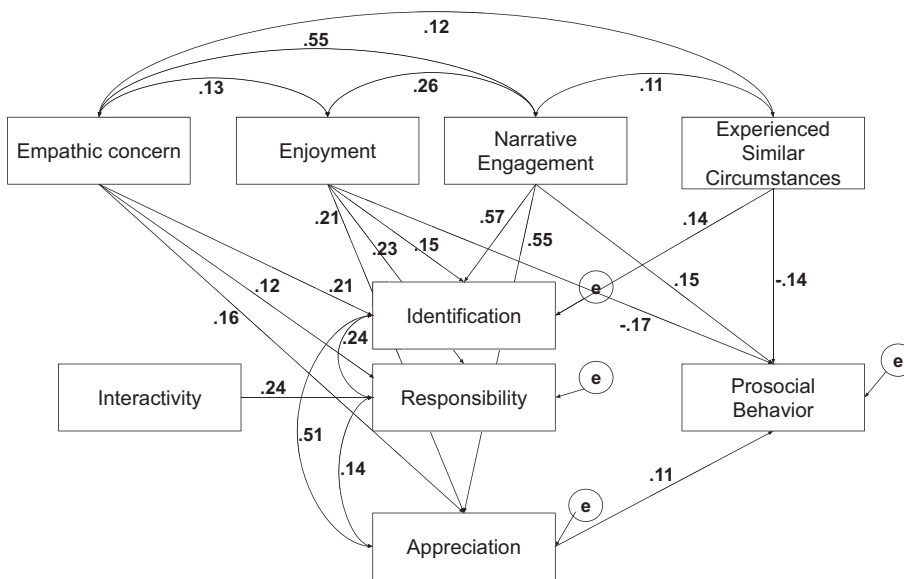
The clearest result found was that interactivity in the form examined did not impact the percentage donated. These findings are in contrast to those previously found in other studies (Green & Jenkins, 2014; Peng et al., 2010; Ruggiero, 2015; Steinemann et al., 2015).

One possible explanation is that the experimental manipulation of interactivity did not work. However, considering that here interactivity was defined merely in terms of the ability to allow decision-making, which the story did, and the finding that participants did experience more responsibility for the story and the character, which have previously been strongly associated with interactivity (Green & Jenkins, 2014), the conditions did appear to differ, at least in these most basic respects.

⁶ Further analysis conducted included analysis of variance for all four outcome variables, which found the same effects as the pathway analysis (i.e., responsibility was the only variable that was significantly different across the conditions of interactivity) and a multiple group analysis to test for a moderation effect of "experienced similar circumstances," which, however, found no significant differences in model fit. More information on these analyses can be found on the Open Science Framework.

Table 3. Overview of hypotheses, exploratory analyses, and corresponding results

Confirmatory Analysis		Finding	Hypothesis confirmed
H1	Interactivity will lead to a higher percentage donated	$\beta_{H1} = .02$	No
H2	Interactivity will lead to more identification with the character	$\beta_{H2} = -.03$	No
H3	Identification will be positively related to a higher percentage donated	$\beta_{H3} = -.17$	No
H4	Interactivity will lead to more responsibility	$\beta_{H4} = .23$	Yes
H5	Responsibility will be positively related to a higher percentage donated	$\beta_{H5} = .08$	No
H6	Interactivity will lead to more appreciation	$\beta_{H6} = -.05$	No
H7	Appreciation will be positively related to a higher percentage donated	$\beta_{H7} = .17$	Yes
Exploratory Analysis			
Research Question		Finding	Supported
RQ 1	Does experiencing similar circumstances impact the percentage donated?	$\beta_{RQ1} = -.13$	Yes

**Figure 4.** Structural equation model of the processes between interactivity and prosocial behavior examined in the exploratory analysis including standardized estimates of direct effects.

If, therefore, the conditions can be argued to differ in terms of interactivity, but the effects of interactivity were not comparable to those found in other studies on prosocial behavior and attitudes, it begs the question of whether the form of interactivity examined across these studies may have differed in fundamental ways, which would account for these differences.

To attempt to answer this question, we take a closer look at the stimuli used in this study compared with studies that have previously found interactivity to affect prosocial behavior and attitudes (Peng et al., 2010; Ruggiero, 2015; Steinemann et al., 2015). In the current study, a noninteractive article about a single parent who becomes homeless was used as a basis, to which interactive elements were added to examine the difference between an interactive and noninteractive story. The actions included options such

as deciding whether to stay with one's mother or one's best friend, or how to respond to uncomfortable questions asked by coworkers. The interactive narrative ended for all players with a friend offering them and their children a place to stay for as long as they wished. While these decisions were designed to feel meaningful, they differed notably from the decisions in the interactive conditions used in the study by Peng et al. (2010), Ruggiero (2015), and Steinemann et al. (2015), who utilized the games for change *Spent* or *Darfur Is Dying*. In *Darfur Is Dying*, the player takes up the role of a person living in a refugee camp, who must venture out of the camp while having to avoid being captured by the militia patrolling the area. In *Spent*, the player is a single parent who recently lost their job and must try and survive the month on US \$1,000, while facing difficult choices, such as whether or not to send their child

to an expensive gifted program. While these games tackle separate issues using different design approaches, they do have two crucial factors in common. First, almost every decision in the game had drastic consequences – either bringing the player ever closer to being caught by the militia or running out of money. Often, one wrong decision could mean losing the game. Second, both games are quite difficult; in Steinemann et al. (2015) for example, the vast majority of players of *Darfur Is Dying* lost the game. Contrasted with the far less severe consequences of choosing to stay with one's mother or a friend and ultimately ending up in a safe and stable environment, it could be argued that the decisions made in games such as *Darfur Is Dying* and *Spent* could be experienced as far more important and meaningful. Described in terms used by Green and Jenkins (2014), user control over the narrative structure was likely more strongly felt when players could see the clear consequences of their actions. This is supported by previous research that has found that inspirational and motivational video clips were only associated with increased prosocial behavior when combined with perceived choice (Ellithorpe, Ewoldsen, & Oliver, 2015). Yet another study found that participants were more satisfied making decisions instead of having a decision made for them only when they clearly could differentiate between two options and that only the differentiated options led to a higher sense of responsibility (Botti & McGill, 2006). In the current study, while responsibility did differ between the interactive and noninteractive conditions, responsibility in neither condition was particularly high. The low sense of responsibility even in the interactive narrative could well be due to the fact that decisions were rarely followed by clear consequences, for example, opening the letter in the morning instead of the evening led to a day less time to pack, but had no further consequence or lasting repercussions.

Furthermore, the most important positive relationships with prosocial behavior were engagement with and appreciation for the narrative. We first hypothesized that interactivity would lead to more appreciation (Elson et al., 2014; Oliver et al., 2015; Steinemann et al., 2015) and this in turn would relate to more prosocial behavior (Morgan et al., 2009; Myrick & Oliver, 2015; Small & Simonsohn, 2008). Perhaps, however, the concept of interactivity should be considered in more nuanced terms than this, in that interactivity can lead to more appreciation by the meaningfulness of the decisions this interactivity entails. In other words, the more meaningful interactivity is perceived, the more appreciation is felt and the more this will in turn lead to prosocial behavior.

While further research comparing different forms of interactive narrative is necessary, the present findings suggest that interactivity is more complex than simply adding decisions to a story. Taken together, the differences

between interactive narratives used in the current study and those used by Peng et al. (2010), Ruggiero (2015), and Steinemann et al. (2015) imply that decisions must feel meaningful and offer clear consequences with emotional ramifications for the player. To be more effective than their noninteractive counterparts, the interactive narrative must be capable of impacting variables such as appreciation and narrative engagement.

Another possible explanation for the failure to find a relationship between interactivity and prosocial behavior could be that interactivity does in fact *not* lead to an increase in prosocial behavior. Arguably, previous studies have suffered from methodological drawbacks, with the studies of both Peng et al. (2010) and Steinemann et al. (2015) being underpowered, which may have led to an over-estimation of effects (Button et al., 2013). Furthermore, to our knowledge no previous studies examining the effects of interactivity on prosocial behavior or attitudes have utilized a yoked design (e.g., Peng et al., 2010; Ruggiero, 2015; Steinemann et al., 2015). Yoked designs have been used in the past to allow for conclusive results on the effects of interactivity on a number of topics from neural activation (Cole, Yoo, & Knutson, 2012) to learning performance (Kickmeier-Rust, Marte, Linek, Lalonde, & Albert, 2008) to the amount of voluntary reading children with dyslexia are willing to do (Ward, McKeown, Utay, Medvedeva, & Crowley, 2012). When the interactive and noninteractive condition are not yoked, it becomes difficult to ensure that any differences between the conditions are truly due to interactivity and not due to differences in the information presented in the conditions. Owing to the high power of the present study, its employment of a yoked design, as well as the use of a preregistered confirmatory analysis, the finding that interactivity does not impact prosocial behavior – at least under the conditions used in this study – can be assumed to be robust. To examine whether interactivity affects prosocial behavior under other conditions, future studies should therefore aim both for sufficient power and, importantly, for the use of a yoked design. Preregistry of confirmatory analysis is recommendable for research across fields.

While interactivity failed to impact any processes save responsibility in the estimated model, a number of interesting effects between the examined psychological processes and prosocial behavior were observed. For one, the positive relationship between appreciation and prosocial behavior corroborates previous findings (Steinemann et al., 2015), further establishing appreciation as an important experience to consider when designing for prosocial behavior in contexts such as, but not limited to, games for change. The previously unexamined positive relationship between narrative engagement and prosocial behavior suggests an interesting factor to keep in mind in further research.

The negative effect of identification on prosocial behavior was unexpected. The exploratory analysis provided a possible explanation, as having oneself experienced similar circumstances to those depicted in the narrative was associated both with higher identification with the character and a smaller donation. Including this variable in the model led the negative relationship between identification and prosocial behavior to disappear. A possible interpretation could be that having experienced similar circumstances to those of a homeless family might be associated with an increased chance of still being in difficult circumstances, potentially needing the money more, and therefore being less willing to donate. It is also possible that in the context of the story used in this study, experiencing similar circumstances, and thereby identifying more with the character, affected donations negatively, because participants who had experienced similar circumstances in the past did not believe that donations to charities would necessarily improve the situation of the person affected. In future studies, it may therefore be worth controlling for perceived efficacy of proposed solutions. However, even controlling for the effect of previous experience, the hypothesized positive relationship between identification and prosocial behavior was not observed in the model. Considering that instead appreciation and narrative engagement were related to prosocial behavior, this may suggest that, at least under certain circumstances, a narrative's meaningfulness and its ability to engage the reader may perhaps be more important for promoting prosocial behavior than character identification is (Bartsch, Kalch, & Oliver, 2014; Small & Simonsohn, 2008). Put differently, a reader could identify with a character or a character's action, but would not necessarily think of the issue as meaningful or engaging enough to donate.

Enjoyment being negatively related to prosocial behavior, while appreciation was positively related, further supports the differentiation between these two forms of media experience (Oliver & Bartsch, 2010). For games for change, the findings that the less fun and entertaining, yet the more meaningful and moving the experience is, the more people will donate at the end, hints at the importance of focusing on creating experiences that are appreciated rather than enjoyed (Bartsch et al., 2014; Myrick & Oliver, 2015; Steinemann et al., 2015). This finding comes, however, with the caveat that this is solely related to whether people will donate. Other experiences, such as willingness to share the interactive narrative with other people or starting to play in the first place, may be impacted by the degree of enjoyment experienced or expected to be experienced (Cohen, 2014). Further research on the impact of appreciation and enjoyment on prosocial behavior other than donating is therefore recommended.

Limitations and Outlook

While this study offers several promising findings, it also has clear limitations. Most importantly, the main question of this study of how and why interactivity impacts prosocial behavior presupposed that a significant impact of interactivity on prosocial behavior would be found. As this was not the case, mediation effects could not be observed. While these remain interesting research questions, the findings of this study as they were observed may offer valuable insights into why interactivity may work in some cases but not in others. Future studies on the relationship between interactive narratives and prosocial behavior should therefore carefully consider how interactivity is manipulated, in particular whether the decisions are considered meaningful by participants.

Furthermore, the high values for appreciation and identification may have led to a ceiling effect, which would make differentiating between experimental conditions more difficult and therefore may have impeded the analysis. However, while not the main focus of the study, the positive relationship of appreciation, narrative engagement, and prosocial behavior suggests interesting avenues for future research on interactive narratives. For example, the possibility of losing and facing negative consequences when wrong decisions are made, or the simple uncertainty of the outcome and the resulting suspense, may be crucial factors worth future study (Hall, 2015; Ruggiero & Becker, 2015).

Conclusion

The results of this study support the importance of appreciation, enjoyment, and narrative engagement in the context of media trying to further prosocial behavior.

The results, however, also indicate that the relationship between interactivity and prosocial behavior may not be as simple as previously assumed. We argue that examination of further interactivity-related variables, such as the emotional consequences of decisions made, as well as the outcome of the story (i.e., whether one can lose or experience a negative outcome), may be crucial elements when creating interactive narratives with the goal of encouraging prosocial behavior. Lastly, while donating behavior as an instrumentalization of prosocial behavior is both relevant and meaningful, other behavioral consequences of interacting with narratives, for example, how willing people are to share the narrative with friends or to start reading the narrative in the first place, may offer interesting themes for future research.

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Choosing to Help Monsters: A Mixed-Method Examination of Meaningful Choices in Narrative-Rich Games and Interactive Narratives

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ABSTRACT

UPDATED—January 8, 2018. The potential of narrative-rich games to impact emotions, attitudes, and behavior brings with it exciting opportunities and implications within both entertainment and serious game contexts. However, effects are not always consistent, potentially due to game choices not always being perceived as meaningful by the players. To examine these perceptual variations, we used a mixed-method approach. A qualitative study first investigated meaningful game choices from the players' perspectives. Building on the themes developed in this first study, a quantitative study experimentally examined the effect of meaningful game choices on player experiences of appreciation, enjoyment, and narrative engagement. Results highlight the importance of moral, social, and consequential characteristics in creating meaningful game choices, which positively affected appreciation. Meaningfulness of game choices may therefore be crucial for narrative-rich games and interactive narratives to impact players.

ACM Classification Keywords

J.4 Social and Behavioral Sciences: Sociology, Psychology;
K.8.0 Personal Computing: Games

Author Keywords

Meaningful Choice; Appreciation; Games Narrative; Player Experience.

Please note that this paper contains spoilers for several games.

INTRODUCTION

Much has been written about the potential of games to evoke emotions [4, 14, 16], change attitudes [31], or even influence behavior [6, 14]. Games can make people laugh, cry, or think [4]. They have been found to change attitudes towards minorities [31] and observed to encourage healthy living [12, 18] and prosocial behavior [38]. Compared to other forms of media, games can uniquely use the power of interactivity to allow

for an engagement with their content that otherwise might not have been possible. Looking specifically at interactivity operationalized as making choices in narrative-rich games and interactive narratives, Elson et al. [11] argue that the ability of games to enable players to create stories personalized to their own values and wishes, allows for an experience less likely to be available to other forms of media, such as films or television. However, research has found mixed results when examining the effects of interactivity. On the one hand, findings, such as the above-mentioned effect of games on attitude change [31] or prosocial behavior [38], were causally linked to the games' interactivity, as both studies experimentally compared interactive (the game) with non-interactive narratives (a text or a film with similar [31] or identical [38] content). In contrast however, a large-scale pre-registered experimental study found no effect of narrative interactivity on narrative engagement, identification with the character, or behavior [37]. Similarly, a study on moral choices in a post-apocalyptic narrative found no effect of interactivity on enjoyment, meaningfulness, or attachment to the character [35]. These results suggest that simply adding narrative choices as a feature of interactivity may not lead to beneficial outcomes. While the existence of mixed results does not devalue the potential of interactive narrative-rich games to produce desired outcomes, it may indicate that without further knowledge of why some of the previous research on choices in games finds effects and some does not, expecting games to have benefits beyond that of non-interactive media may amount to an often-times unfruitful gamble. A primary goal of this paper therefore will be to shed light on when narrative interactivity, that is making choices in narrative-rich games, may lead to effects and when it will not.

A first step in this direction is to clarify what is understood by making choices as a feature of interactivity in narrative-rich games. While previous research investigated interactivity operationalized as making choices in a variety of different narrative-rich games [31, 35, 38, 37], interactivity as an overall concept has received much attention and is widely discussed in HCI games research (e.g., [3, 9, 10, 33]). For instance, Crawford's definition of interactivity in interactive storytelling [10] focuses on the cyclic process between the player and the game as a system where good listening, speaking and thinking define a good interaction. Similar to Salen and Zimmerman [33], Bogost [3] defines interaction in games as players explor-

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ing possible manipulations of the game and its rules. If well designed, a choice, that players make within these rules, can be an example of a good manipulation [3]. In sum, the need to make choices can add to the interactivity of the game [10] and is even defined as a most basic interactive feature that makes a media into a game [9, 11, 15]. The question follows, when choices result in a good interaction. Bogost [3] addresses this issue within the context of persuasive games in that a game is most persuasive – and hence good – if players do not just randomly select options without mental effort, but they are provoked to think as a result of making choices. Notable for narrative-rich games is that effects of narrative interactivity have been found to be largely independent of visual representations and can therefore be examined using text-based games [38] and game prototypes [5]. Therefore, in this paper we focus on choices being made in narrative-rich games.

Steinemann et al. [37] argued that for interactivity, defined here as making narrative choices, to have an effect, these choices must be perceived as meaningful. With this they meant that players must perceive the choice as important enough to lead to a different experience than if they had been passively reading or watching the same narrative. In this study, the narrative focused on a person who became homeless. While this narrative may in itself have been perceived as meaningful, the choices used may well not have been, as they centered mostly around the order in which to stay with friends and relatives and often-times had little to no consequences on the further course of the narrative. In contrast, the narrative used by Ruggiero [31] followed a person who must survive on \$1000 for a month, with each difficult choice, such as whether or not to pay for medication for a sick parent, severely affecting the course of the game and its outcome. Similarly, Steinemann et al. [38] used the game *Darfur is Dying* [G21] about a Darfurian refugee child named Poni, who must leave the refugee camp and brave the dangers outside to bring back water for her family. Here too, each choice of which direction to run, or whether to hide, had immediate consequences and could mean the capture of Poni and the end of the game. Relatedly, Salen and Zimmerman [33] define play as a meaningful interactivity if the interaction between player's action and the games' outcome results in meaning. As in this current study we want to evaluate whether play is meaningful and therefore the interaction is good enough to persuade players [3], we focused on Salen and Zimmerman's *integrated evaluative meaningful play* [33], because it implies that the game can be successful if players react in an emotionally meaningful way to the outcome of their interaction within the game. Oliver and Bartsch [26, 2] also focus on emotional and cognitive reactions within the experience of meaningfulness called appreciation. It could therefore be interesting to empirically investigate whether choices in narrative-rich games lead to meaningful experiences if they and their consequences evoke emotional and cognitive reactions that are also perceived as meaningful by players.

Supporting the argument that the effect of narrative interactivity may be related to the meaningfulness of choices, are the results in the study on *Darfur is Dying* [G21], where the effect of interactivity on behavior was mediated by appreciation [38].

Appreciation is a measure for the extent to which a media experience is meaningful in the sense that it is thought-provoking, emotionally moving, and insightful [2, 25]. Appreciation was also measured in the study covering the narrative of a homeless person [37], in which appreciation was once again related to behavior, but, akin to behavior, was not impacted by the interactivity in that particular narrative [37]. A further goal of this present study therefore is to understand what characteristics make narrative game choices meaningful in that they lead to a higher appreciation.

THEORETICAL BACKGROUND

Meaningful choices in games have been the subject of a focused analysis in entertainment research conducted by Nay and Zagal [24]. In this analysis it is postulated that meaningful choices in games often take the form of moral choices that can create ethical player experiences, through which the player can significantly impact the course of the game. That these choices have clear consequences is often argued to be a crucial factor in their being perceived as meaningful [34, 39]. However, the importance of consequences is also under debate, as opponents argue that more crucial than manifested consequences, is the choice itself and what it signifies to the player [24, 22, 36]. For example, if in *The Walking Dead* [G16] players must decide whether to let a wounded animal suffer or to kill it quickly, as argued by Nay and Zagal [24], the outcome would be the same, however the choice is meaningful, due to how this choice reflects on how players see their character, or even themselves.

While antecedents and effects of meaningful choices in games have, to our knowledge, so far not been empirically examined, there is a wealth of interdisciplinary research on the perception of choice on the one hand, and experiences of meaningfulness in games on the other that can inform our understanding. In a study examining the impact of emotionally moving games on player experience, Bopp et al. [4] found particularly strong feelings of sadness, such as loss due to the death of a character, as well as mixed affect to be related to feelings of meaningfulness in games. Further predictors of appreciation were feelings of contemplativeness, such as when the player paused to consider what they would personally have done in the same situation. In a study directly comparing fun and meaningful game experiences, Oliver et al. [26] highlighted the importance of social connection for meaningful experiences. In a related study, Rogers et al. [30] found meaningfulness to be related to rich narratives, connecting with other players and in-game characters, the depth of the characters, and feelings of accomplishment. Beyond this, the argument for the importance of morality made in the theoretical discussion by Nay and Zagal [24] of meaningful choices was mirrored in the results of Rogers et al. [30]. One of the most prominent distinctions of meaningful experiences found in this study was in the presence of morally difficult situations, such as in *Star Wars: Knights of the Old Republic* [G5] or in *The Witcher 3* [G20]. Furthermore, Rusch [32] understands deep and meaningful games as games with content related to the human condition, defined as deep, insightful and purposeful experiences that are somehow also related to the players' personal life. This understanding finds support in an interview study by Mitgutsch

[32], where participants associated a variety of game experiences such as mastering challenges, learning skills, and social relations with meaningfulness. According to their conclusion, an experience within the game may become particularly meaningful for players, if their current personal life circumstances fit the game content.

Research by Krmar and Cingel [21] on moral decision-making in games has previously found participants playing *Fallout 3* [G23] to reason along sophisticated foundations of morality, similar to moral reasoning in real-life. In this study, moral reasoning was coded along the moral foundations of Moral Foundation Theory by Haidt and Joseph [17]. This theory defines five foundations of morality: a) *Harm/Care*: taking care of others versus harming them, b) *Fairness/Reciprocity*: acting fairly, c) *Ingroup/Loyalty*: acting loyal to the ingroup, d) *Authority/Respect*: respecting authority, and e) *Purity/Sanctity* being in line with relevant purity rules (e.g., chastity, hygiene). The foundation *Harm/Care* was used most frequently in moral in-game reasoning [21].

Finally, a further aspect of meaningful choices in games theoretically discussed [24], which finds empirical support from interdisciplinary research, is the importance of consequences. From an educational and psychological perspective, choices are considered meaningful when people can decide autonomously. In order for a choice to be perceived as autonomous, the person choosing must understand what the choice entails, in other words, what the potential consequences of the choice are [27, 40]. The importance of autonomous choice, where the person feels responsibility for the choice, is often highlighted as crucial for learning [1, 39], as it allows for comparisons between different options on the one side and necessitates active reflection to reach a conclusion on which to base the choice, on the other [40]. Concurrently, these are the same arguments on which the potential of interactivity for learning are based on (e.g., [29]).

Aim of this paper

In study 1, the goal is to qualitatively explore how players perceive meaningful choices in games and identify overarching themes. This is done in an initial first examination of descriptions of meaningful choices that players experienced. Building on what we learn, the goal of the quantitative study 2 is to create a narrative in a high-meaningful and a low-meaningful version, and to experimentally test the effect of meaningfulness on appreciation. Furthermore, the goal is to see how meaningfulness impacts the effect of narrative interactivity on appreciation, to examine whether the inclusion of meaningful narrative elements may be a possible explanation for differing effects of a very simple form of narrative interactivity in games.

STUDY 1

The goal of this exploratory study is to examine what specific characteristics players associate with meaningful choices in games (*RQ1*). To this end, we aim to extend the knowledge on meaningful player experiences, by specifically looking at possible characteristics of meaningful choices in games, and the thoughts and feelings related with the concept of meaningfulness.

Methods

Participants

We created an online survey which was distributed on an experiment platform for the students of our institute (students received course credit for participation, $n = 10$), among our own social network (Facebook $n = 11$), and the media aggregation platform Reddit ($n = 4$). The total sample consisted of 27 participants (8 females; mean age: 24.85 years, ranged from 20 to 33 years) who were primarily students ($n = 19$).

Survey Questions and Procedure

Participants read and signed a consent form before being instructed to recount meaningful choices in games. They were asked to name the game in which they encountered a meaningful choice ($q1$: “What is the name of a game in which you had to make choices that you perceived as meaningful?”), describe at least one choice they had to make that was experienced as meaningful ($q2$: “Please describe at least one of the choices you had to make that you experienced as meaningful.”), and explain what about this choice made it meaningful to them ($q3$: “What about this choice made it meaningful to you?”). To keep our definition of meaningfulness as open as possible for this first round of research, participants were instructed to base their answer on whatever “meaningful” meant to them personally. Participants were asked to be as concrete as possible and write at least 30 words. Last, they were asked to provide demographic information on gender, age, and occupation. The study took 10.4 minutes to complete on average.

Coding Procedure

To understand what the characteristics of the meaningful choices were, we conducted a thematic analysis (based on Clarke, Braun and Hayfield [8]) of the responses to the two open-ended questions $q2$ and $q3$. The first and the second author coded all 27 responses together, while differences were readily resolved in discussion. As we analyzed and interpreted the reported experiences based on knowledge gained from previous work on meaningful choices [24], meaningful game experiences [26, 25], and morality [17, 21], we conducted a *deductive* thematic analysis [8]. By following the recommended analysis steps [8], we read through all responses and wrote down the game scene, the content and number of choice options. As a first step, this was done to familiarize ourselves with the choices that participants encountered in the specific games. This helped with the basic understanding of the reported choices and their context. Second, we discussed the possible code categories and formulated their definition based on the nine concepts associated with meaningfulness addressed in previous literature (Morality [21, 24, 30], Moral Foundations Theory [17, 21], Strategic vs. Moral Choices [21], Moral and Other Dilemmas [30], Social Relations [26, 25], Consequences of Choices [24], Thought-Provoking and Emotionally Moving [26, 25]). These concepts were used as the framing for our coding. Third, we went through the first 10 responses and discussed whether the above listed concepts occurred as defined in the respective literature. Forth, all responses were coded a first time. After this first round of coding, the code definitions were defined as follows:

Type of Option: All choice options a participant mentioned were categorized as either moral (options related to moral prin-

ciples [21]) or strategic (options beneficial for game outcome, [21]). Besides moral and strategic options, we discovered that certain choices made by participants were neither beneficial for game outcome nor related to moral principles, but described best as emotional or affective (e.g., *Grand Theft Auto V (GTA V)* [G19]: choose to kill one of three characters although you have emotional bonds to each of them). Hence we defined a third category: emotional options. Options could be in conflict with each other in various ways, for instance a choice between the option to steal, which would mean your group would survive but others would starve (strategic and moral towards your group), versus the option not to steal, which would mean your group could starve, but others would survive (moral towards the others).

Moral Foundations and Moral Dilemmas: Options that were categorized as moral, were additionally more finely classified according to the five foundations of Moral Foundation Theory [17]. When moral options were pitted against each other, they were furthermore coded as moral dilemmas (yes/no).

Social Interactions: Descriptions were coded for whether there was a social interaction (yes/no), and whether either other human players or Non-Player Characters (NPCs) were involved.

Consequences: Each answer was coded in terms of whether the consequences of the choice was described (yes/no, e.g., choices without describing the consequences could be to take the path into the forest or the path up the mountain, but not saying where the path would lead to), whether these consequences were clear (yes/no), and what kind of consequences these were (i.e., someone will be punished).

The first author coded all responses a second time and then clustered the found codes based on their thematic similarity and formulated descriptions of these groups. Finally, the first and the second author discussed these groups and adapted their descriptions accordingly, which are reported in the result section.

Results

The 27 survey participants reported on meaningful choices experienced in 24 different digital games through a wide variety of genres and scenarios (see Table 1 in Supplementary Materials for an overview of the individual game choices by game). Thematic analysis of the open answers to *q2* and *q3* lead to the following overarching themes to be developed.¹

Consequential Choices: Taking Consequences into Account

In the descriptions participants gave of why a choice was meaningful, all but one of the explanations included information on how the choice shaped consequences.

“I had to choose whether to assist an alternate universe character in suicide, or to let this character die painfully and slowly. In this alternate universe, she is paralyzed and cannot breathe normally.” (P22, *Life is Strange*)²

¹Preliminary results of the first 16 participants were published as a work-in-progress extended abstract [19].

²In all direct participant quotes: Where mistakes related to grammar and spelling were made, they have been corrected to improve legibility.

There was a difference however in how much knowledge participants had of the short- and long-term consequences of their choices, before committing to them. Often participants only knew what the short-term consequences would be, for example when a participant recounted deciding whether to stay with potentially treacherous pirates or to go through a gate to an unknown level (P21). In these situations, the participants only knew that the story (e.g., *Deus Ex* [G22], *Baldur's Gate II* [G4]), or the character (e.g., *Skyrim* [G24], *Guild Wars 2* [G1]) would change, but they did not know – while deciding – what this change would exactly look like. Instead of taking away from the meaningfulness of the choice, unknown long-term consequences seemed to add to the meaningfulness for some participants, as in *The Witcher 3* [G20] and in *BioShock* [G10].

“I didn't realize at first that what I did would have repercussions to the effect that it did. This lead to me carefully considering everything and choosing between what is easy and what is right.” (P25, *The Witcher 3*)

“Drugs are a precious resource for the player, and whenever you meet a Little Sister, you have a chance to kill them and take all of the drugs they have on them; or you can try to save them, collecting only half as much valuable drugs. [...] the Little Sisters you save start leaving you presents throughout the world containing other valuable items. [...] Their kindness reminds me that choosing the evil option, to kill them for immediate gain, isn't worth the cost of their lives. Even in desperate times when it seems it's every man for himself, charity comes around.” (P23, *BioShock*)

Having influence over the narrative through their choice was also an important factor that made the choice meaningful to some players:

“The storyline of the game is dependent on the choices I make, so I try to make the choices that are most suitable both for the outcome of the game but also from my personal perspective.” (P5, *Persona 5*)

Furthermore, in *Deus Ex* [G22] players had the ability to experience different sequences of story events, where the meaningful choices made the narrative order personalized to each player:

“It allowed for the story to follow a natural narrative; you weren't constrained to following the leads put in front of you. You had the option of which information to obtain first, and based on that information, followed an organic lead which exposed you to more or less of the story in advance of this confrontation.” (P24, *Deus Ex*)

Moreover, an interesting aspect of being able to choose in a story was the factor that players had choices with lasting repercussions. For example, in *Guild Wars 2* [G1], a game that can be played for dozens of hours, players could only choose an order for their character once:

“The fact that you can't change order later on adds further importance.” (P16, *Guild Wars 2*)

Such experiences combined with consequences such as (possible) harm, lead players to more carefully consider what to choose in the end.

Social Choices: It Means More When Someone Else Is There
The vast majority of reports of meaningful choices included mention of a social aspect to the choice. Interestingly, all but two of these social instances were with NPCs, not with other players. Players often reported developing an emotional bond with NPCs. This made choices that affected this character particularly meaningful.

“...And then there was the girl. I usually try to identify myself with my character and me and that vampire girl became friends. So joining the hunters would have meant to let her down. And I found her very friendly and cool. And I felt a bit sorry for her because she was threatened unfairly so I wanted to help her.” (P6, *Skyrim*)

Some participants drew parallels to real life, considering what they would do, were this to happen in their own relationships (i.e., *Halo 2* [G11], *Dragon Age Series* [G6], *The Sims* [G18], and *Life is Strange* [G13]). For instance, player P22 stated:

“It made me think deeply about whether I would make this same decision in my real life if my best friend were under the same circumstances.” (P22, *Life is Strange*)

Moral Choices: When There Is No Right Choice

Most of the choices described contained at least one moral option. While some choices weighed moral against strategic options, most moral choices consisted of two moral options pitted against each other, creating a moral dilemma. In these moral dilemmas, different moral foundations according to the Moral Foundation Theory [17] had to be weighed against one another. The most frequent combination was for choices to force players to decide between caring for (or not harming) an outgroup member on the one hand and the good of their ingroup on the other.

This was the case in *Metro 2033* [G15], where P9 was responsible for the survival of their ingroup (humans) who believe themselves to be threatened by an outgroup (void-monsters that might just want to communicate and even negotiate). Being given the opportunity to destroy the monsters, resulted in the following reasoning for the choice to be meaningful:

“I get to choose if they live or if they die, if they are no harm to humans, just simply misunderstood and it’s an immense moral decision, where I have to evaluate my own values depending my personal morals and the ones I see that are practiced upon the rest of the post-apocalyptic society.” (P9, *Metro 2033*)

Similarly, in *This War of Mine* [G8], where player P1 had to decide whether to take medicine belonging to an old couple to support their own group also in need of medical supplies:

“The elderly couple in the game beg you not to, with the husband stating that his wife will not survive if you take the medicine, and that they will both starve if you take the food. At this point in the game however, the playable characters are themselves starving and sick, and may

also die if you do not steal the food and/or medicine.”
(P1, *This War of Mine*)

Further Findings

While moral choices made up the bulk of meaningful choice options, in some cases meaningfulness was a consequence of the emotionality of the situation, such as in *GTA V* [G19], where the player had to choose which of three characters, with each of which they had built up a connection, to kill.

“The worst thing about this was that I then had to kill them myself, making me sit in front of the screen, telling myself that I could not do it but still doing it after all in the end.” (P8, *GTA V*)

Both losses and accomplishments were mentioned in the context of meaningful choices, although these examples were few. Some players observed that, as a result of their choice, they gave up when they realized that they had made the wrong choice (e.g., *Persona 5* [G3], *Yu Gi Oh Duel Links* [G17], *Harry Potter and the Chamber of Secrets* [G2]). Conversely, one player (P27) recounted how an unexpected win due to making the right choices felt meaningful while playing *PlayerUnknown’s Battlegrounds (PUBG)* [G9].

“First there was the excitement of the play/the strategy. It was about evaluating the pros and cons, and then when performing the made decision the excitement/thrill kicked in. Second there was the weight of the decision. We knew that if we took the wrong settlement, things could go very south for us.”(P27, *PUBG*)

Discussion Study 1

Study 1 identified three overarching themes in the meaningful game choices described by participants. These consisted of choices being defined by social and moral characteristics, and these choices having consequences. Within and beyond these themes, there was a wide variety of aspects that participants associated with meaningful choices, similar to previous findings [23, 30] and the various descriptions of the human condition in the context of deep and meaningful games [32]. An alternative clustering of experiences is the differentiation between participants associating choices to the mechanics versus the narrative of the game. For game choices to be meaningful, it was argued that both mechanics and narrative can lead to players being meaningfully affected [33]. For instance, a player reported being confronted with tough choices in *PUBG* [G9], where places to hide were limited. Similarly Elson et al. [11] discussed that such obstacles, as a mechanic game aspect, can also meaningfully affect players. In the report on *PUBG* [G9], the focus was more on moving forward or selecting the best strategic move. However, a more often reoccurring pattern was the combination of the three meaningful themes and the three different choice options pitted against each other, while most of the games were narrative-rich. For instance, in *Skyrim* [G24] as well as in *Bioshock* [G10] participants reported on choices allowing them to more easily move forward (strategic option) while also wanting to help other game characters (emotional and social). While helping resulted in a loss of time and was hence strategically worse in the short-run, in the long-run players received other things such as trust or gifts from the

	Choice	No Choice
High - Meaningful	Choose: Pick flower for mother OR save friend	Randomly assigned: Pick flower for mother OR save friend
Low - Meaningful	Choose: Pick flower for strength OR turn back	Randomly assigned: Pick flower for strength OR turn back

Figure 1. The experimental 2x2 design consisted of the four conditions choice x high-meaningful, no choice x high-meaningful, choice x low-meaningful, and no choice x low-meaningful. Each participant was randomly assigned into one of the conditions.

helped characters. Whereas moving forward alone may be a more strategic perspective focusing on winning the game, adding social, moral and emotional options was associated with players not only focusing on winning the game, but additionally caring for other game characters, which may in itself contain more meaning. These findings offer an interesting first empirical look into the way players describe meaningful choices in primarily narrative-rich games. They however do not allow assumptions of whether these characteristics can be causally linked to narratives being perceived as more meaningful. To extend these findings therefore, a second study was conducted to experimentally examine these themes and their impact on making a choice as a feature of interactivity.

STUDY 2

To test whether the addition of the characteristics identified in study 1 as central to meaningful choice would lead to a higher appreciation (RQ2), a narrative was designed based on these findings. This narrative was created in a high-meaningful (including social, moral and consequential choice characteristics) and low-meaningful (without social, moral and consequential characteristics) version. Additionally, we wished to examine whether the effect of making a choice on appreciation would change based on the meaningfulness of the choice (RQ3). Therefore the narrative was also presented in choice and no choice versions. The resulting four conditions can be seen in Figure 1.

Methods

An experimental 2x2 between-subject design was used. The independent variables were the very simple form of narrative interactivity “choice” with two levels (choice, no choice) and “meaningfulness” with two levels (high-meaningful, low-meaningful). The primary dependent variable was *appreciation*. Further dependent variables were *enjoyment* and *narrative engagement*. To control for confounding effects, *care morality* was also included.

Stimuli

The stimuli used was a short story written by the second author based on the findings of study 1. The narrative was written to mirror the choice scenarios seen in study 1, which often played in fantasy contexts (e.g., *Skyrim* [G24], *Baldur's Gate II* [G4], *Dragon Age - Inquisition* [G7], *The Witcher 3* [G20]) and included choices between loyalty to your ingroup and caring

for an outgroup member (often represented as a monster e.g., *Metro 2033* [G15], *Undertale* [G14], *Skyrim* [G24]).³

The short story followed the narrative of an adventurer who ventures into an enchanted forest to find a magical flower. On the way they encounter several obstacles, such as a werewolf, whom the adventurer befriends, moth creatures from whom the bear and adventurer must save each other, and ultimately a sleeping dragon that is guarding the flower. The narrative existed in two different versions (high-meaningful, low-meaningful) with four different endings (two for the high-meaningful version that differed based on the choice and two for the low-meaningful version that were very similar irrespective of the choice, see Supplementary Materials for all story versions).

To ensure that we could examine the impact of a meaningful choice, the choice conditions differed from the no choice conditions solely in the presence of one choice at the end of the story, of whether or not to pick the magical flower, which determined the final outcome of the narrative. Therefore, participants in the choice conditions could choose whether to pick the flower or not, while participants in the no choice conditions were randomly assigned to one of the outcomes. The choice and no choice conditions were yoked, in that the outcome distribution in the no choice conditions was matched to the choice outcome distribution in the choice conditions, thereby controlling for the effect of the individual outcomes.

Meaningfulness was experimentally manipulated by adding narrative elements to the choice, which in study 1 had been associated with meaningful choices. These were the framing of the choice as having social and moral components, as well as clear immediate consequences due to the choice made. Therefore in the high-meaningful condition, the participants were told that the flower was the last hope to heal the adventurer's mother from a serious illness. In contrast, in the low-meaningful conditions, participants were told that the flower would grant them unparalleled strength. Additionally, in the high-meaningful condition, the werewolf would accompany the adventurer up until the dragon's lair, at which point it was attacked by the same moth creatures previously encountered. The resulting commotion would awaken the dragon. In the low-meaningful conditions, the werewolf would leave before the final leg of the journey.

In the high-meaningful conditions therefore, when confronted with the choice whether to dare to pick the flower, participants had to choose between the options of picking the flower from under the awakened dragon's nose to save their mother or to leave the flower to be destroyed by dragon fire in order to save their friend the bear from the moth creatures. This choice was intended to mirror the moral dilemmas with a social component often mentioned in study 1 as particularly meaningful choices.

In the low-meaningful conditions, when confronted with the choice whether to dare to pick the flower from under the

³The short story was evaluated for comprehensibility and narrative engagement using an open-ended answer and a questionnaire, respectively, described in the measurement section.

dragon's nose, the participants simply had to choose between risking the dragon waking up while they snuck up to pick the flower, or returning home empty-handed. This choice also had less dire long-term consequences. Picking the flower occurred without the dragon awakening. Not picking the flower led to the adventurer encountering another flower outside of the dragon's lair, which could be picked without risk. In contrast, in the high-meaningful conditions, saving the bear meant the flowers were lost and the adventurer would have to live with the knowledge that they had lost the last hope of healing their mother (a dire long-term consequence compared to the low-meaningful condition). Picking the flower on the other hand meant the adventurers, while managing to pick the flower, were severely burnt in the process and had to live with the knowledge that they had left their friend to die.

Participants

Participants were recruited on the crowdsourcing platform Mechanical Turk and the media aggregation platform Reddit. Mechanical Turk participants received US\$2 for participating and all participants had the opportunity to partake in a lottery for one of four US\$50 Amazon gift cards. Of the total sample of 261, 49 were excluded for dropping out before the last mandatory question, 16 for insufficiently answering an open answer about the content of the read narrative, three for self-reporting that their data should not be used for analysis, and one for participating more than once. The resulting sample size of 192 participants (107 female) was included in all further analysis. The sample consisted of 165 participants from Mechanical Turk and 27 participants from Reddit. The mean age was 36 years, ranged from 18 to 77 years. The majority of participants ($n = 177$) resided in the United States. 148 participants were employed or self-employed, 26 were students, 18 were unemployed, six were retired, four self-identified as homemakers or stay-at-home parents and two as disabled.

Measures

Appreciation, as a measure of the experience of meaningfulness, and *enjoyment* were measured using the scales developed by Oliver and Bartsch [25], consisting of three items for appreciation ("I was moved by this story", "I found this story to be very meaningful", "The story was thought-provoking"; Cronbach's $\alpha = .90$) and three items each for enjoyment ("The story was entertaining", "It was fun for me to read through the story", "I had a good time reading through this story"; Cronbach's $\alpha = .96$). Items were measured on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree).

Narrative engagement was measured using the scale developed by Busselle and Bilandzic [7]. It consists of six positively formulated items (e.g., "While reading, my body was in the room, but my mind was inside the world created by the story") and six reverse items (e.g., "I found my mind wandering during the story"; Cronbach's $\alpha = .87$). Items were measured on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree).

The moral foundation "care" of the Moral Foundation Theory was measured using the subscale developed by Graham et al. [13]. This subscale consists of six items in total. The first three items relate to how relevant certain considerations are for judging an action as right or wrong (e.g., "Whether or not

someone cared for someone weak or vulnerable"). These items were measured on a 6-point Likert scale (1 = not at all relevant, 6 = extremely relevant). For the last three items participants indicated their agreement with statements (e.g., "One of the worst things someone could do is hurt a defenseless animal"). These items were measured on a 6-point Likert scale (1 = strongly disagree, 6 = strongly agree). The resulting variable will be referred to from here on as *care morality* (Cronbach's $\alpha = .77$).

In an open question participants were asked to describe the narrative in three to four sentences, in order to evaluate whether they had read and understood it.

Procedure

After signing a consent form, participants began the study by filling out the *care morality* scale. Next, they were randomly assigned to one of the four experimental conditions. After reading the narrative in the version of their condition, participants filled out the questionnaires on *appreciation*, *enjoyment* and *narrative engagement*, and described the content of the story in an open-ended response format. Finally, participants filled out a demographic questionnaire, were given the opportunity to leave optional comments on the study, were thanked and informed that they had reached the end of the study. The study took 24.6 minutes to complete on average.

Results

An alpha level of .05 was used for all statistical tests. All analyses were conducted with R [28].

Descriptive Results

Using boxplots, univariate outliers were detected for *enjoyment*, *narrative engagement*, and *care morality*. These variables were subsequently winsorized (threshold: 95%) to minimize the influence of outliers on statistical estimates. Means, standard deviations and sample sizes for all dependent and covariables by condition are listed in Table 1. Notable are the relatively high ratings for *appreciation*, *enjoyment* and *narrative engagement* across conditions. Pearson's correlations can be seen in Table 2. Notable are the high correlations between all variables. As the pre-experimentally measured variable *care morality* correlated significantly with *appreciation* and the other dependent variables, it was included as a covariable in further analysis.

	Choice		No Choice	
	High-Meaningful	Low-Meaningful	High-Meaningful	Low-Meaningful
N	51	50	46	45
Appreciation	5.43 (1.32)	4.61 (1.43)	5.05 (1.54)	4.64 (1.64)
Enjoyment	6.10 (.92)	6.02 (.98)	5.94 (1.11)	6.08 (.95)
Narrative Engagement	5.48 (.90)	5.34 (.80)	5.62 (.89)	5.37 (.90)
Care Morality	4.50 (.72)	4.75 (.64)	4.79 (.78)	4.72 (.76)

Table 1. Descriptive statistics: Means, standard deviations and sample sizes by condition.

	Appreciation	Enjoyment	Narrative Engagement
Appreciation			
Enjoyment	0.68***		
Narrative Engagement	0.64***	0.71***	
Care Morality	0.28***	0.32***	0.26***

Table 2. Pearson's Correlations among dependent and covariables over all conditions. *Significant at $p < .001$**

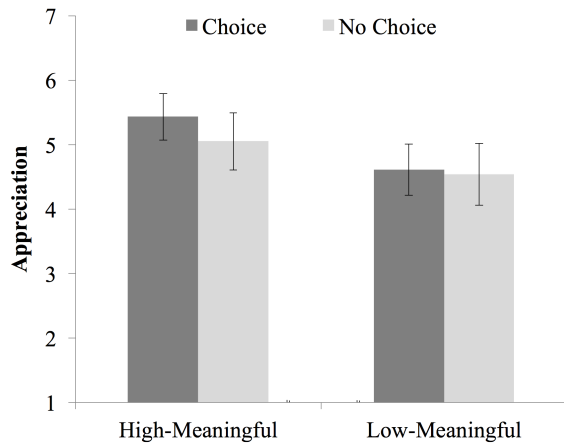


Figure 2. Mean differences in appreciation across conditions. Error bars depict the 95% confidence intervals.

Effect of Meaningfulness on Appreciation

Building on the results of study 1, our second research question (*RQ2*) was whether the intended manipulation of the meaningfulness of the choice would lead to increased *appreciation* for the narrative. To examine this, a two-way analysis of covariance (ANCOVA) was conducted with meaningfulness (high-meaningful, low-meaningful) and choice (choice, no choice) as the independent variables and *care morality* as the covariable. There was a significant main effect for meaningfulness $F(1, 184) = 9.59, p = .002, \eta^2 = .044$, while the main effect for choice was not significant $F(1, 184) = 1.42, p = .23, \eta^2 = .006$. *Care morality* was significantly associated with *appreciation* $F(1, 184) = 20.51, p < .001, \eta^2 = .093$, justifying its inclusion. No interaction effects were significant (p-values between .061 and .688). *RQ2* therefore could be answered in the affirmative.

Effects of Choice on Appreciation in high-meaningful Compared to low-meaningful Conditions

Our third research question (*RQ3*) concerned whether the effect of choice on appreciation would be different for high-meaningful compared to low-meaningful choices. To examine this, a contrast analysis examined three planned contrasts: (c1) the choice compared to the no choice narrative in the high-meaningful conditions, (c2) the choice to the no choice narrative in the low-meaningful conditions, and (c3) the high-meaningful choice condition compared to the other three conditions. The analysis showed a significant effect for (c1) $t(184) = 2.04, p = .042$, Cohen's $d = 0.30$, no significant effect for (c2) $t(184) = 0.83, p = .407$, Cohen's $d = 0.12$, and a significant

effect for (c3) $t(184) = 2.19, p = .03$, Cohen's $d = 0.32$. This indicates that choice lead to a significant increase in appreciation when the choice was high-meaningful (c1), but not when the choice was low-meaningful (c2), and that the high-meaningful choice condition lead to a higher appreciation than the other three conditions (c3). In terms of *RQ3*, the results suggest that choice lead to an increase in appreciation in the high-meaningful conditions, but not in the low-meaningful conditions.

Exploratory Analysis of Further Effects

To explore the effect of choice and meaningfulness on further experience variables, a two-way multivariate analysis of covariance (MANCOVA) was conducted with meaningfulness and choice as the independent variables, *enjoyment* and *narrative engagement* as the dependent variables and *care morality* as the covariable. The analysis showed no significant effects of either choice or meaningfulness on *enjoyment* or *narrative engagement* (p-values between .067 and .997), with solely *care morality* relating to enjoyment $F(1, 184) = 19.96, p < .001, \eta^2 = 0.107$ and narrative engagement $F(1, 184) = 9.85, p < .001, \eta^2 = 0.067$. These results indicated that both our manipulation of meaningfulness and of choice had primarily impacted *appreciation*, leaving *enjoyment* and *narrative engagement* relatively unchanged across conditions.

Additionally, an exploratory analysis examined whether *appreciation* differed between groups depending on the narrative outcome they had received or chosen. To examine this, first the difference in *appreciation* between the high-meaningful outcomes for "help the werebear" ($M = 5.25, SD = 1.39$) and for "pick the flower for your mother" ($M = 5.26, SD = 1.5$) were compared using a simple one-way analysis of variance (ANOVA). The results were not significant ($p = .976$). Likewise, the difference in *appreciation* between the low-meaningful outcomes for "turn back without the flower" ($M = 4.21, SD = 1.47$) and for "pick the flower" ($M = 4.68, SD = 1.53$) were compared. These results were also not significant ($p = .339$).

GENERAL DISCUSSION

This paper aimed to examine what characteristics players associate with meaningful choices (*RQ1*) and how these choices impact appreciation in narrative-rich games (*RQ2*). Of particular interest was the question of whether the meaningfulness of choices could explain why choice as a feature of interactivity may impact appreciation in some narratives, but not in others (*RQ3*). Study 1 focused on *RQ1*, utilizing a qualitative study design, in which participants of an online survey were asked to describe meaningful game choices. Analysis of responses resulted in the overarching themes of consequential, social, and moral characteristics central to meaningful choices in primarily narrative-rich games.

The theme related to the consequences of the choice was characterized by players having knowledge relating to repercussions of the choice options. Such as when the consequences of helping one's friend commit suicide were evident to the player in *Life is Strange* [G13]. While immediate consequences were clear, unknown long-term consequences could add to the meaningfulness of the choice. In retrospect, choices could

gain additional meaningfulness through the further repercussions that they caused, such as when sparing a character lead to the death of another later in the narrative (*The Witcher 3* [G20]). The social theme was embodied by the presence of either another player or a non-player character in the vast majority of choices mentioned. Thereby for example, the choice of becoming a vampire became meaningful to a large extent through the friendship the player had built with a vampire in *Skyrim* [G24]. In another example the choice to kill one of three characters in *GTA V* [G19] was given gravity through the hours spent playing and developing a relationship with all three characters. Finally, the moral theme was categorized by the meaningful choices in which the player had to make difficult moral choices, often having to weigh two moral values, such as care or harm for a stranger against care or harm for one's ingroup (e.g., *This War of Mine* [G8], *The Walking Dead* [G16] or *Heavy Rain* [G12]). These choices forced players to evaluate their own values and choose between options in which there were oftentimes no right answers.

Based on these themes, a narrative was created for study 2, in which choice and meaningfulness could be experimentally manipulated. Results showed a significant effect of the meaningful conditions on appreciation, independently of choice. This finding indicated that the manipulation had worked and the inclusion of the themes identified in study 1 of consequential, social, and moral characteristics of the choices did indeed lead to a higher appreciation of the narrative. A separate analysis of the effect of making a choice in the meaningful conditions revealed a significant difference between the choice and the no choice conditions for the narratives where the choice was constructed to be meaningful. The same analysis for the low-meaningful conditions showed no difference. Finally, the high-meaningful choice condition was perceived as more meaningful than the other three conditions, suggesting that making a choice can indeed add a valuable benefit to a narrative, if this choice is meaningful. These findings have several implications, which are discussed in the following sections.

Meaningful Choice as an Important Property of Effective Narrative Interactivity

The finding that making a choice only affected appreciation for the conditions with a high-meaningful choice, but not for the conditions with a low-meaningful choice, offers interesting implications in terms of the mixed results found for the effect of interactivity in narrative-rich games (e.g., [38, 37, 31, 35]). Steinemann et al. [37] discussed that the choices used in their study may not have been perceived as meaningful, thereby potentially causing the making of these choices to have no effect. Findings from study 2 offer support for this argument that making a choice in narrative-rich games may only then be effective when the choices are perceived as meaningful. Based on the findings of study 1 and corroborated by the findings of study 2, we can furthermore offer suggestions on the characteristics likely to lead to the perception of meaningful choices.

Choice Consequences

For choices to be perceived as meaningful, the inclusion of a belief that one's choice had consequences appeared as crucial

in the accounts in study 1. This supports previous theoretical arguments on the subject [34, 39]. At the same time, this characteristic is more nuanced than it would perhaps seem at first glance. As raised by Nay and Zagal [24], more important than the outcome of a choice is that the impact of what one has done is felt. This theoretical discussion is also mirrored in the results of study 1, where some instances had a scenario where players could not prevent a negative outcome from occurring, no matter which choice they made. For example in *Life is Strange* [G13], where players must choose whether to assist their friend in committing suicide. The friend would die either way, but players had to decide whether to help them die quickly of their own hand or wait for them to die slowly and painfully. Similarly, in the meaningful conditions of study 2, players could not prevent both deaths, and could merely choose to save either their friend or their mother. While analysis for these conditions showed that the outcome itself had no effect on appreciation, what did impact appreciation was the ability to choose. The central point, as argued by Nay and Zagal [24], is that players must decide which choice fits to their own values or the personality of the character they are representing. This is also reflected in arguments made by Elson et al. [11] that an important element of interactive narratives is their ability to let players create a narrative fitting their personal preferences.

Moral Choices in a Social Context

Most choices mentioned in study 1 contained choices that were characterized by moral and social elements. The importance of social elements reflects the findings on the importance of social presence for meaningful game experiences in general [26, 30]. Interestingly, more often than not the social element was provided by a Non-Player Character (NPC), not a real person. Nevertheless, due to the attachments formed by the player towards these characters, choosing to harm or care for them became a meaningful and often difficult choice. This is in line with past research that has found that oftentimes relationships with fictional characters in games are treated similarly to real-life relationships [21, 41, 42]. A possible explanation for the prevalences of NPCs in the meaningful choices in this study could be that, while the player could not conceivably be harmed in the game, no matter which choice was made, consequences for NPCs could be dire, potentially even permanent. An interesting discussion on the nuances of differences between perceptions of NPCs and player characters has already begun [42] and deserves further attention. The importance of moral elements for meaningful choices is in line with both theoretical arguments on the topic of game choices specifically [24] and empirical findings on the topic of game experience generally [30]. Moral dilemmas were central in the meaningful choices reported. Often, the moral foundation *Harm/Care* was pitted against *Ingroup/Loyalty*. As in study 2 *care morality* correlated strongly with appreciation, it stands to reason that the effect of including moral dilemmas will depend on individual differences in the importance of the foundations in question. The inclusion of Moral Foundation Theory [17] in examinations of meaningfulness of choices in games may offer promising directions for the future.

Further Findings

There were different potential characteristics of meaningful choices in games that could have been expected based on the theoretical background [4, 30, 32, 33], but did not appear as themes in our analysis of study 1. Emotional reasons for the meaningfulness of particular choices, while present, did not occur as a central theme. While emotion may have been perceived by the participants as secondary for the meaningfulness of the choice, it may have still played an important role, particularly in keeping the choice salient. The role of emotion in meaningful choice is certainly worth further research.

Rogers et al. [30] discussed the importance of rich narratives for meaningful experiences. While not prevalent in study 1, study 2 did find a significant correlation between narrative engagement and appreciation. Mitgutsch [23] and Rogers [30] also highlighted the importance of accomplishment for meaningful experiences. This did not emerge as a central theme in the current study, however instances of both defeat (e.g., in *Harry Potter and the Chamber of Secrets* [G2]) and achievement (e.g., in *PUBG* [G9]) were mentioned. This is certainly also an interesting avenue for future research.

It is interesting that neither meaningfulness nor making a choice would have affected enjoyment or narrative engagement, while both constructs were closely related to appreciation. While this does add further strength to the argument that appreciation and enjoyment are two different concepts [25, 26], it is also possible that longer exposure might have led to different results, with enjoyment and narrative engagement in longer less meaningful narratives likely to decrease with time.

Limitations, Strengths & Future Research

While we believe this study offers many valuable insights, there are also clear limitations. For study 2, a strength and weakness in one was the use of only one choice in the choice condition. The strength, and the reason why it was done, was that this allowed all differences between conditions to be clearly ascribed to this one choice and its influencing characteristics. The weakness however is that the effect of this simple form of interactivity might have been stronger, had there been more choices throughout the narrative. Additionally, perhaps even in the non-meaningful condition this one choice may have been perceived as more meaningful than intended, due to its novelty. That one meaningful choice alone was enough to lead to significant differences between conditions, does however strongly speak for the value of meaningful choices for the understanding of interactivity features such as choice. Nevertheless, future research should focus on examining meaningful choice with a broader selection of choices. An interesting question here will be whether one meaningful choice in a selection of otherwise meaningless choices still leads to an overall more meaningful experience than a non-interactive version of the same narrative.

Furthermore, this work's findings are restricted to one particular feature of interactivity, which is making a specific choice that was experienced as meaningful. Previous work done on meaningfulness in games [3, 10, 9, 33] points out the importance and potential of elements of meaningful choices in games. However, no research to our knowledge has examined

these choices empirically. As theoretically discussed before [33], what is important for the concept of meaningful play is the evaluation of it as meaningful enough so that a game can be successful in affecting players' emotional and psychological states, which we did by showing how meaningful choices could affect appreciation. Moreover, empirical research on appreciation of entertainment has focused on non-interactive forms of media, making this contribution not only a first empirical examination of meaningful choices in games, but also one of the first studies on appreciation of interactive media. Therefore, we present a novel opportunity to discuss meaningful choices in narrative-rich games from an empirical standpoint.

Another interactivity-related limitation was the focus on solely narrative choices. Other forms of interactivity, such as dexterity-based interactivity needed in fast-paced action games, have their own potential and most likely their own rules for when they will be more effective than non-interactive alternatives. Another limitation was the restriction of measures to only subjective experiences, excluding behavior or attitude change. These were outside of the scope of this study, which serves as a first step in examining the effect of meaningfulness and its relation to making a choice in narrative-rich games. The hope is however, that future research will extend these insights to include behavior and attitude measures. Likewise outside of the scope was the independent examination of the effects of the identified characteristics (consequential, social, and moral) of meaningful choices. This too deserves further research.

Finally, a central strength of this study was the use of mixed-methods. This allowed a qualitative study to first explore the concept of meaningful choices in narrative-rich games, upon which the second study then experimentally tested and expanded on the conclusions drawn in the first study. This allowed a more comprehensive and informative examination of the topic area, consequently strengthening the results [20].

CONCLUSION

Using a mixed-methods approach, meaningful choices in narrative-rich games and their impact on the effect of making a choice on appreciation in narrative-rich games were examined through two studies. The results of the qualitative study 1 revealed meaningful choices in participants' accounts to be defined by the presence of social and moral characteristics and a belief that their choices impacted the resulting immediate consequences. The results of the quantitative experimental study 2 found the presence of these mechanics to significantly impact appreciation as the experience of meaningfulness, thereby validating the findings of study 1. Furthermore, the finding that making a choice had an effect on appreciation only for the high-meaningful choice condition supports the argument that adding a choice as a form of narrative interactivity is not a silver bullet, but may only be effective when the choices the player can make are perceived as meaningful.

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Deciding to Help In-Game Increases Real-Life Prosocial Behavior – The Impact of Reward and Reasoning

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Abstract

Researchers have become increasingly interested in the potential of games to foster real-life prosocial behavior. It has been argued that in-game prosocial acts may affect players' real-life behavior, but so far, little is known about how games affect players' in-game prosocial decisions and how this may in turn influence their real-life prosocial decisions. To address this gap, two experiments investigated whether choosing to help an in-game character affected a subsequent real-life prosocial decision, donating to a charity, as well as the potential moderating effects of game rewards and player reasoning. In total, 270 (study 1) and 185 participants (study 2) played a first-person shooter game, where they were confronted with a decision to help a character. While the first study focused on whether the decision to help in-game would transfer to real-life prosocial behavior, the second study aimed to understand how reward provided for help in-game would influence this transfer. The results of the first study indicate that deciding to help in-game led to increased donating. The second study further revealed that the absence of a reward for in-game prosocial behavior affected players' reasoning, and increased prosocial self-concept and donating.

Keywords: Games, donation, moral and strategic reasoning, game reward, moral consistency, prosocial behavior

1. Introduction

Games confront players with many decisions and the opportunity to experience their consequences. These decisions often relate to prosocial interactions

with game characters, making digital games an interesting avenue for studying
5 social interactions with potential transfer to real-life prosocial behavior (Murphy & Zagal, 2011; Schulzke, 2009; Triberti et al., 2015). Indeed, several studies have found that playing prosocial games may increase real-life prosocial behavior (e.g., Gentile et al., 2009; Greitemeyer & Mügge, 2014; Greitemeyer & Osswald, 2010; Greitemeyer et al., 2012). However, it has been hypothesized that effects
10 are less consistent for video games containing both prosocial *and* violent content (Greitemeyer & Mügge, 2014). For instance, some studies involving violent games with prosocial content found a decrease (Ellithorpe et al., 2015), whereas others observed an increase in real-life prosocial behavior after playing (Happ et al., 2013). These results hint at further variables potentially moderating the
15 relationship between video game content and real-life behavior. Despite their popularity (e.g., Call of Duty, Battlefield, Grand Theft Auto V, Entertainment Software Association, 2017), still little is known about the impact of violent games with prosocial content on real-life prosocial behavior (Joeckel & Dogruel, 2016).

20 Two possible explanations underlying previous inconsistent results might relate to players' voluntariness to engage in prosocial in-game behavior, as well as whether they are rewarded for it. First, voluntary decisions have been found to help predict transfer effects compared to mandatory decisions (Clot et al., 2016; Khan & Dhar, 2006; Mullen & Monin, 2016). However, to our knowledge,
25 most studies on games and real-life prosocial behavior usually assign players to predetermined conditions rather than let them decide voluntarily (e.g., Gentile et al., 2009; Greitemeyer & Osswald, 2010; Greitemeyer et al., 2012; Velez, 2015; Ellithorpe et al., 2015; Happ et al., 2013). Second, rewards are a common game mechanic (e.g., Phillips et al., 2015). For instance, players may gain
30 Karma points for helping game characters in Fallout 3 (Schulzke, 2009). Outside of games research, rewards have been found to affect prosocial behavior (e.g., Zuckerman et al., 1979). However, whether game rewards affect players' motives and subsequent in-game decisions has not been studied yet.

To address these research gaps, two experiments were conducted. Specifi-

35 cally, we investigate the influence of (1) providing a voluntary decision and (2)
rewarding in-game prosocial behavior on real-life prosocial behavior in the con-
text of a violent game. In Study 1, participants were confronted with a prosocial
in-game decision and were free to decide whether to help a non-player character
(NPC), followed by a real-life prosocial decision. Study 2 expanded upon the
40 first experiment by manipulating whether participants received an in-game re-
ward for choosing to help, as well as asking them to reason why they chose to
help or not to help.

2. Theoretical Background

Many studies have focused on the potential effects of violent video games on
45 real-life aggressive behavior (e.g., Gabbiadini et al., 2014; Gollwitzer & Melzer,
2012; Grizzard et al., 2014; Hartmann & Vorderer, 2010). A growing body of re-
search has also emerged around the potential positive effects of *prosocial* games
on real-life prosocial behavior (e.g., Gentile et al., 2009; Greitemeyer & Oss-
wald, 2010; Greitemeyer et al., 2012, for an overview see Greitemeyer & Mügge,
50 2014). However, these studies often directly compared prosocial with antisocial
(i.e., violent) video games, where players' predominant goal was to either bene-
fit (prosocial) or harm (antisocial) another character (Greitemeyer & Osswald,
2010; Tear & Nielsen, 2013; Teng et al., 2018). Games containing both violent
and prosocial goals were rarely compared (Greitemeyer & Mügge, 2014). In
55 spite of the popularity of video games featuring both violent and prosocial con-
tent (e.g., the Mass Effect, Fallout, or BioShock series), it thus remains largely
unclear how prosocial decisions in a violent video game affect real-life prosocial
behavior. Moreover, even though many studies pretested their game stimuli
with regards to game difficulty and liking (Gentile et al., 2009; Greitemeyer &
60 Osswald, 2010), the investigated video games often differ markedly in terms of
content, game mechanics, characters, presentation or popularity. For instance,
Gentile et al. (2009) randomly assigned participants to Super Mario Sunshine
or Chibi Robo (prosocial conditions), Ty the Tasmanian Tiger 2 or Crash Twin-

sanity (violent conditions), or a neutral pinball game (Pure Pinball or Super
65 Monkey Ball Deluxe). Other studies employed games with prosocial goals (e.g.,
Lemmings in Greitemeyer & Osswald, 2010; Tear & Nielsen, 2013; Teng et al.,
2018), but which also let players deliberately act cruelly (e.g., by letting the
Lemmings walk off a cliff).

In fact, studies manipulating individual game aspects yielded inconsistent
70 findings with regards to effects on prosocial real-life behavior (Ellithorpe et al.,
2015; Ewoldsen et al., 2012; Greitemeyer et al., 2012; Happ et al., 2013). Happ
et al. (2013), for example, found that playing a morally good character (Super-
man) in a very violent video game (Mortal Kombat vs. DC Universe) led to an
increase in subsequent prosocial behavior compared to playing a morally bad
75 character (The Joker). In contrast, Ellithorpe et al. (2015) found that partici-
pants behaved less prosocial in a follow-up task, if they chose to act particularly
moral in Mass Effect 2.

Similar phenomena of people acting differently as a consequence of prior
prosocial behaviors have been investigated in social psychology (e.g., Merritt
80 et al., 2010; Mullen & Monin, 2016). According to the notion of *moral consis-*
tency, people who do good deeds in one situation are more likely to act prosocial
in a subsequent situation (Conway & Peetz, 2012). However, as suggested by
the findings of Ellithorpe et al. (2015), people may see good deeds as a license
to subsequently act in a morally more apprehensive manner (i.e., *moral licens-*
85 *ing*, Merritt et al., 2010). It remains largely unclear under which circumstances
moral licensing or morally consistent behavior may emerge from games (Joeckel
& Dogruel, 2016).

Another crucial limitation of many studies investigating the effects of proso-
cial game content is that participants were either assigned to prosocial versus
90 antisocial (or non-prosocial) conditions, or were primed to act in a (non-) proso-
cial manner (Breuer et al., 2017; Ellithorpe et al., 2015; Greitemeyer et al., 2012;
Happ et al., 2013; Velez, 2015). According to Sicart (2009), however, (perceived)
freedom of decision is key to the game experience. Similarly, outside of games
research, several studies suggest that voluntariness moderates whether moral

95 licensing or moral consistency manifest (Clot et al., 2016; Khan & Dhar, 2006; Mullen & Monin, 2016). For a better understanding of when in-game prosocial decisions consistently transfer to prosocial real-life actions, it is thus essential to investigate voluntariness in games.

3. Study 1

100 While previous studies suggest that prosocial in-game decisions affect real-life prosocial behavior (e.g., Ellithorpe et al., 2015; Ewoldsen et al., 2012; Greitemeyer & Mügge, 2014; Happ et al., 2013), the aim of Study 1 was to explore whether participants' voluntary prosocial decision in a violent game would lead to moral licensing or morally consistent real-life behavior. Therefore, we formulated the following research question:

RQ1: How will the decision to help in a violent game influence real-life prosocial behavior (i.e., donation)?

3.1. Method

3.1.1. Study Design

110 To investigate RQ1, a first-person-shooter (FPS) game was developed, where participants were confronted with a prosocial decision. Participants were randomly assigned to one of two groups: A control group, where players did not encounter a non-player character (NPC) requesting help, and an experimental condition where participants were free to decide to help the NPC. The dependent variable was the amount players decided to donate to a charity following game play.

3.1.2. Participants

A total of 300 participants were recruited via CrowdFlower, a crowdsourcing platform. Recruitment was restricted to 15 countries where English is the official language (e.g., USA, Canada). Participants were paid 1\$ compensation for participating. Thirty data sets were excluded, because they were incomplete (n

= 25) or because the same participants had repeatedly participated in the study (n = 5). In the latter case, only the first participation was included.

The final sample consisted of 270 participants, 44 women, 225 men, and 1
125 participant who preferred not to disclose their gender, age ranging from 18 - 59 years (M = 28.92). The majority of participants played video games on a daily (n = 135) or weekly basis (n = 100), with the remaining playing once a month or less. None stated to have never played video games. Completing the study took 21.26 min (SD = 19.43) on average.



Figure 1: Screenshot of the FPS game. Player health and ammunition are displayed in the lower left and right corner of the screen respectively. Controls are displayed below the screen.

130 3.1.3. Materials

An FPS game (Figure 1) was developed using the Unity v4.6.1 game engine. The core features of the game (i.e., weapons, movement, enemies) were based on the Realistic FPS Prefab template from the Unity Asset Store and expanded with various freely available 3D computer models. The FPS genre was chosen for
135 comparison with earlier studies that also employed action shooter games (i.e.,

Mass Effect 2 and FlatOut respectively, [Ellithorpe et al., 2015](#); [Greitemeyer et al., 2012](#)), and because it was previously argued that FPS games provide a promising avenue for studying moral processing in games ([Krcmar & Cingel, 2016](#)). The game was compiled to work with the Unity Web Player.



Figure 2: Participants had to press the Y-key to accept or press the N-key to refuse helping the NPC.

140 After loading the game, players had to navigate and fight their way to a cabin. In the cabin, players eventually reached a room with a starving and thirsty man, who asked them whether they were willing to sacrifice their health and time to get him some food and water ([Figure 2](#)). Players then had to decide whether to help the NPC.

145 Accepting to help the man opened a path which led players into a burning room. According to [Batson & Powell \(2003\)](#), sacrificing important resources is a defining characteristic of prosocial decisions. Hence, players had to ‘sacrifice’ health points and time (i.e., important in-game resources) by taking damage from the fire as they searched the room for 4 food and water items. To ensure
150 exposure to the experimental manipulation, players had to complete the quest to advance the game. After completion, players reached the final room containing an exit door which concluded the game.

If players refused the NPC’s request or did not encounter an NPC (i.e.,

control group), they followed the same route as players who had chosen to help,
155 sans the burning room. Players' decision was tracked by the game program.
Overall, the duration of the game ranged from 5.12 min to 80.33 min, with
over 70% of participants finishing the game in under 20 minutes ($M = 17.77$
min, $SD = 11.27$ min). While inspecting the boxplot of gameplay duration
revealed outliers, gameplay duration did not significantly differ between the
160 four conditions, nor was it correlated with any of the outcome variables, and
was therefore disregarded for the analysis.

3.1.4. Measures

Prosocial self-concept was measured as manipulation check to assess whether
participants perceived the in-game decision as prosocial. As in previous studies
165 investigating prosocial decisions (e.g., Khan & Dhar, 2006), it was measured
with four items ("Please indicate the extent to which you agree or disagree *in this*
moment with the following statements: "I am compassionate", "-sympathetic",
"-warm", "-helpful") with a 7-point Likert scale rating (1 = strongly disagree, 7
= strongly agree). Internal consistency was excellent: Cronbach's $\alpha = 0.91$.

170 To assess real-life prosocial decision, participants were asked how much of
their 1\$ compensation they were willing to donate to a charity, the *Against*
Malaria Foundation (<https://www.againstmalaria.com/>). This charity was
selected, because it is considered a top rated charity among several independent
charity evaluators (e.g., GiveWell, 2016; GivingWhatWeCan, 2016). Partici-
175 pants could select the donation amount from a drop-down menu with 5% incre-
ments ranging from 0% to 50%. The maximum amount was set to 50%, because
a pilot test with 23 participants revealed a generally low donation willingness
and only one participant mentioned they would have donated more than 50%.

Finally, participants in the experimental condition were asked whether they
180 had expected a reward for helping (i.e., "Did you expect a reward for helping
the game character?", answer options "Yes" or "No"), regardless of whether they
had chosen to help or not.

3.1.5. Procedure

After reading the game instructions, participants were randomly assigned
185 to the experimental ($n = 171$) or the control condition ($n = 99$). Within the
experimental condition, 96 participants decided to help the NPC, whereas 75
participants refused to do so.

After completing the game, participants were asked to rate their prosocial
self-concept. Then, they could decide how much of their 1\$ study compensation
190 they were willing to donate to charity. Next, participants of the experimental
condition were asked if they expected a reward for helping the NPC. Finally,
after providing demographic information and answering a verification question
to ensure data quality, participants received a CrowdFlower compensation code.

3.2. Results

195 All statistical tests were calculated at a significance level of $\alpha = .05$. As none
of the dependent variables were normally distributed, non-parametric Kruskal-
Wallis one-way analysis of variance (Field et al., 2013) were conducted, unless
noted otherwise. All analyses were conducted with R (R Core Team, 2016).

3.2.1. Manipulation Check

200 Prosocial self-concept differed significantly between conditions (Kruskal-Wallis
 $\chi^2 = 19.81$, $df = 2$, $p < .001$, $\eta^2 = .06$). A Tukey-Kramer Post Hoc test con-
firmed higher prosocial self-concept scores in the help group compared to the
no-help group ($p < .001$, Cohen's $d = 0.47$), and higher self-concept scores in
the help group than in the control group ($p = .001$, Cohen's $d = 0.55$). Means
205 and standard deviations are displayed in Table 1.

3.2.2. Percentage Donated

A significant main effect for in-game decision on percentage donated was
found (Kruskal-Wallis $\chi^2 = 6.12$, $df = 2$, $p = .047$, $\eta^2 = .04$). A Tukey-Kramer
Post Hoc test confirmed that the help group donated more than the no-help
210 group ($p = .001$, Cohen's $d = 0.46$) and the control group ($p = .027$, Cohen's

Table 1: Descriptive statistics per condition for Study 1.

Condition	N	Prosocial Self-concept	Donation (%)
		Mean (SD)	Mean (SD)
No Help	75	4.80 (1.32)	7.53 (14.53)
Help	96	5.45 (1.47)	17.19 (21.89)
Control	99	4.67 (1.38)	11.01 (17.67)

$d = 0.55$). A Pearson chi-square test indicated that helping participants were also more likely to donate compared to the no help and the control groups ($\chi^2 = 7.10$, $df = 2$, $p = .029$, Odds Ratio = 2.34). Overall, participants who helped the NPC donated the most, whereas participants who did not help donated the least (see Figure 3). With regards to RQ1, it seems that in-game and real-life behavior followed a morally consistent pattern.

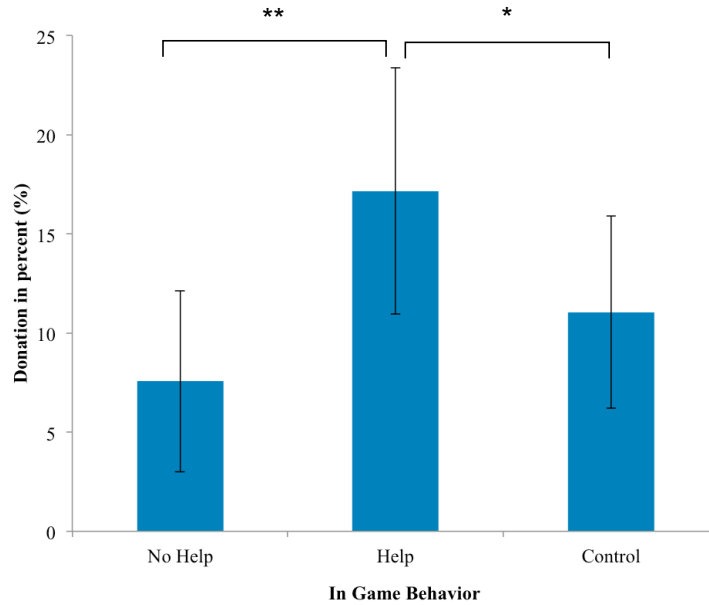


Figure 3: Average percentage donated by condition. Note. * $p < .05$, ** $p < .01$.

3.2.3. Exploratory Analysis: Reward Expectation and Percentage Donated

Of the 171 participants in the experimental condition, the majority expected a reward ($n = 106$), with only $n = 41$ (38.68%) having decided to donate. Players
220 who had expected a reward also donated significantly less ($M = 10.33\%$, $SD = 17.91$) than those who did not expect a reward ($M = 17.23\%$, $SD = 21.47$), as indicated by a Mann-Whitney U-Test ($W(106,65) = 2749$, $p = .015$ (two-tailed), Cohen's $d = 0.35$). Of the 65 participants who had *not* expected a reward, $n = 37$ (56.92%) decided to donate.

225 3.3. Discussion Study 1

In line with previous research (Gentile et al., 2009; Greitemeyer & Osswald, 2010; Greitemeyer et al., 2012; Happ et al., 2013), participants who decided to act prosocially in the game were also significantly more likely to donate. Specifically, a single prosocial decision in a violent game was sufficient to in-
230 crease real-life prosocial behavior, suggesting that participants acted morally consistent (Conway & Peetz, 2012). Moreover, while previous studies in social psychology (Khan & Dhar, 2006) found that *voluntary* prosocial behavior more likely induced a licensing effect, we found that players behaved morally consistent in real life after voluntarily choosing to help in-game. A possible
235 explanation for this finding might be that participants who helped voluntarily in the game, identified more strongly with their in-game decision, which has been argued to lead to a consistency effect (Clot et al., 2016; Mullen & Monin, 2016). However, it seems also plausible that some participants helped and donated, because they were generally more empathetic than participants who had
240 not helped (Batson & Powell, 2003; Davis, 1994; Triberti et al., 2015). That is, their decision to donate might have been unrelated to their prior in-game choice. Hence, a key limitation of this study is that we did not control for empathy.

According to Mullen & Monin (2016), people act more often according to moral licensing in ambiguous decision situations, whereas unambiguous decision
245 situations promote morally consistent actions. Unlike Ellithorpe et al. (2015), our study found a moral consistency effect, as participants who helped, donated

more than participants who did not. In the study of [Ellithorpe et al. \(2015\)](#), the decision might have been perceived as ambiguous, because it depicted a moral dilemma. In contrast, the request for help in our game was perhaps perceived as
250 less ambiguous. However, while we know that participants expecting a reward for help donated significantly less than those not expecting a reward, it remains unclear how players perceived the request for help in-game. The lack of reward might have disappointed players, and as a result they decided to donate a lower amount.

255 4. Study 2

Rewards are characteristic of many video games, and defined as “a positive return that serves to reinforce player behavior within a videogame” ([Phillips et al., 2013](#)). Rewards influence players’ experience ([Phillips et al., 2015](#)) but also shape which actions players undertake in a game ([Phillips et al., 2013](#);
260 [Sicart, 2005, 2009](#)). Similarly, rewarding certain in-game actions may affect how players perceive these actions ([Heron & Belford, 2014](#); [Murphy & Zagal, 2011](#); [Sicart, 2009](#)). For instance, players may consider an action “good” if it is rewarded by the game. However, empirical evidence about the effects of game rewards is still scarce ([Kou et al., 2017](#)). [Kou et al. \(2017\)](#) suggested that reward-
265 ing prosocial behavior in the League of Legends community with *influence points* might actually undermine players’ motivation for supporting other community members. In another study, [Kang et al. \(2014\)](#) found that advanced players provide support and free items to novice players, even though no in-game reward was provided or novices being able to return the favor immediately. Beyond
270 games, research suggests that rewards do shape subsequent prosocial behavior. [Ariely et al. \(2009\)](#), for instance, found that rewarding prosocial behavior with a gift may positively influence subsequent prosocial behavior. However, rewards have also been found to undermine prosocial self-concept and behavior ([Batson et al., 1978](#); [Marr et al., 2005](#); [Zuckerman et al., 1979](#)), as rewards
275 may be seen as an exchange of values (e.g., moral value for monetary value)

(Batson & Powell, 2003; Bekkers & Wiepking, 2011). So far, it remains unclear how in-game rewards might affect real-life prosocial decisions outside the game or gaming community. Given the mixed evidence, we formulate the following research question:

280 RQ2: How will rewarding in-game helping affect subsequent real-life prosocial behavior?

According to Zagal (2009, 2012), even if game designers tie in-game choices to moral values, it cannot always be expected that players perceive those as such. This is supported by a recent study by Krcmar & Cingel (2016), who
285 found that players justified their prosocial in-game decisions with moral and strategic reasons to similar extent. Moral reasoning was often tied to players' personal values (e.g., cooperating in-game, because it is the 'right thing' to do in a moral sense), whereas strategic reasoning related to progressing the game and attaining in-game resources (e.g., items, experience points). So far, it is
290 not known how reasoning about in-game decisions affects subsequent real-life prosocial decisions.

According to Mullen & Monin (2016), whether people identify with a prosocial act determines subsequent prosocial acts (Clot et al., 2016; Efron et al., 2009). Therefore we assume that prosocial in-game decisions are more likely to
295 lead to real-life prosocial decisions if players perceive and reason their in-game decision as prosocial. Consequently, reasoning of in-game behavior will affect real-life prosocial decision after playing:

H1: Moral reasoning will lead to more real-life prosocial behavior (i.e., donation) compared to strategic reasoning.

300 Sicart (2009) and Zagal (2012) discuss that subverting players' reward expectations (e.g., not receiving a reward for a moral action or not being punished for a morally reprehensible action) may encourage players to reflect on their in-game behavior or their own ethical values. Kou et al. (2017) found that players were not motivated by in-game rewards (i.e., compensation for an act

305 with points) to report antisocial behavior in League of Legends, because they
felt that it would devalue their support for the game community. How rewards
shape reasoning has however not been experimentally investigated. Hence, we
formulate the following research question:

RQ3: How will rewarding an in-game prosocial decision affect rea-
310 soning?

4.1. Method

4.1.1. Participants

A total of 189 participants were recruited via Amazon Mechanical Turk and
completed the study. Four participants were excluded because their answers to
315 the open questions were not comprehensible, resulting in a final sample of $N =$
185. Participants' age ranged from 18 to 71 years ($M = 32.39$), including 74
women and 111 men. Participants reported playing digital games on a daily (n
 $= 153$), weekly ($n = 26$), monthly ($n = 5$), or yearly ($n = 1$) basis.

4.1.2. Study Design

320 The game was manipulated with regards to whether participants received a
reward for helping (yes versus none). However, unexpected rewards for prosocial
behavior were found to reduce subsequent helping behavior (Warneken &
Tomasello, 2008). Other studies suggest that rewards decrease prosocial behav-
ior if participants were promised a reward before participants agreed to help
325 (Batson et al., 1978; Zuckerman et al., 1979). Hence, we manipulated whether
participants were informed about a reward prior to their decision or after help-
ing. As Study 1 revealed no significant differences between the non-helping and
the control condition without the NPC, we did not include a control group in
Study 2.

330 4.1.3. Materials

The FPS game from Study 1 was slightly modified. In the reward conditions,
helping players received a powerful weapon that defeated enemies in one shot.

Table 2: Overview of experimental conditions.

Condition	Player’s voluntary decision	Manipulation	
		Reward given	Reward mentioned
No Help	No help	–	–
No Reward	Help	None	No
Reward Promised	Help	Yes	Before Helping
Reward Surprise	Help	Yes	After Helping

This reward was chosen, because according to Phillips et al. (2015), weapons are a typical game facility reward, which increase players’ effectiveness to master challenges within a game. In the context of the present game, this meant that the weapon allowed players to finish the game more quickly without dying. In turn, getting no such an advantageous weapon would mean to sacrifice time and health, which is a crucial aspect of prosocial behavior (Batson & Powell, 2003). The reward was either promised before helping the NPC (“You will get a reward for helping.”), or mentioned only after players had helped the NPC (see Table 2).

4.1.4. Measures

Participants were promised an extra bonus of 2\$ in addition to the 1\$ study compensation. This bonus was included to increase the likelihood that participants considered this compensation as their own (Clark, 2002), and therefore render the act of donating more of a prosocial ‘sacrifice’ (Batson & Powell, 2003). As in Study 1, participants were asked after playing whether they wished to donate some or all of their bonus to the Against Malaria Foundation. Participants could select the amount of their donation from 0% to 100% with 10% increments.

Prosocial self-concept was in the same manner as in study 1 (Khan & Dhar, 2006), Cronbach’s $\alpha = .95$.

As people’s trait empathy may influence prosocial decision-making (e.g., Triberti et al., 2015), empathic concern was measured using the Empathic Con-

cern subscale developed by [Davis \(1983\)](#). Participants rated seven statements
355 (Cronbach's $\alpha = .71$, e.g., "When I see someone being taken advantage of, I
feel kind of protective toward them") on a 7-point Likert scale (1 = strongly
disagree, 7 = strongly agree). Finally, participants were asked at the end of
the survey whether they had expected a reward for helping the NPC ("yes" vs.
"no").

360 *Reasoning of Prosocial Decision*

Following the approach outlined by [Krcmar & Cingel \(2016\)](#), participants'
reasoning for (not) helping the NPC were classified into one of the following five
categories: strategic, moral, both, no reasoning, or other reasoning. Descrip-
tions, examples, and frequencies of all categories are available in the supplemen-
365 tary material.

All open answers were coded by the first author. To ensure interrater reli-
ability, the second author independently coded all open answers, resulting in a
substantial interrater agreement of $\kappa = .907$ ([Landis & Koch, 1977](#)).

4.1.5. Procedure

370 Study 2 followed the same procedure as Study 1. Participants were ran-
domly assigned to one of the three experimental conditions (No Reward, Re-
ward Promised prior to helping, Surprise Reward after helping). After donating,
they were asked to explain their reason for helping in-game, and whether they
had expected a reward. The study took 28.57 min (SD = 10.48) to complete
375 on average. Gameplay duration ranged from 9.18 min to 72.17 min with over
70% of participants finishing the game in under 30 minutes. As in study 1,
inspecting the boxplot of gameplay duration revealed outliers. Gameplay dura-
tion however did not significantly differ between the four conditions, nor was it
correlated with any of the outcome variables, and was therefore disregarded for
380 the analysis.

4.2. Results

As none of the variables were normally distributed (tested with Shapiro Wilk) and group sizes were unequal among the four conditions (see Table 3), we employed non-parametric tests. All statistical tests were calculated at a significance level of $\alpha = .05$. All analyses were conducted with R (R Core Team, 2016).

Table 3: Descriptive statistics for all conditions.

Condition	N	Empathic Concern	Prosocial Self-concept	Donation (%)
		Mean (SD)	Mean (SD)	Mean (SD)
No Help	29	4.74 (1.07)	4.12 (1.95)	11.03 (23.35)
No Reward	45	4.94 (0.84)	5.79 (1.08)	25.56 (33.68)
Reward Surprise	47	4.74 (0.96)	5.11 (1.53)	16.17 (30.97)
Reward Promised	64	4.84 (0.88)	5.32 (1.36)	20.31 (29.22)

4.2.1. Empathic Concern

Empathic concern was moderately pronounced in all experimental conditions (see Table 3) and did not significantly differ between experimental conditions (Kruskal-Wallis $\chi^2 = 1.11$, $df = 3$, $p = .774$). Empathic concern was significantly correlated with prosocial self-concept, but not with percentage donated (see Table 4). To control whether empathic concern had an influence on participants' decision to help or donate, we conducted two binary logistic regressions, one for each outcome variables. Empathic concern had no effect on whether participants chose to help the NPC ($b = 0.09$, $SE = 0.23$, $Z = 0.41$, $p = .680$) or their donation behavior ($b = 0.11$, $SE = 0.22$, $Z = 0.52$, $p = .603$).

4.2.2. Manipulation Check

Kruskal-Wallis Rank one-way analysis of variance indicated that the four conditions were significantly different with regards to prosocial self-concept ($\chi^2 = 17.60$, $df = 3$, $p < .001$, $\eta^2 = 0.016$). Tukey post-hoc tests revealed that

Table 4: Bivariate Spearman’s rank correlations over all conditions (N = 185).

Variables	Donation Percent	Empathic Concern	Prosocial Self-Concept
Empathic Concern	.07		
Prosocial Self-Concept	.02	.56***	
Reward Expectation	.05	-.11	.07

Note. *** Significant at $p < .001$.

prosocial self-concept was most pronounced in the no reward condition, followed by the promised reward, surprise reward, and no help.

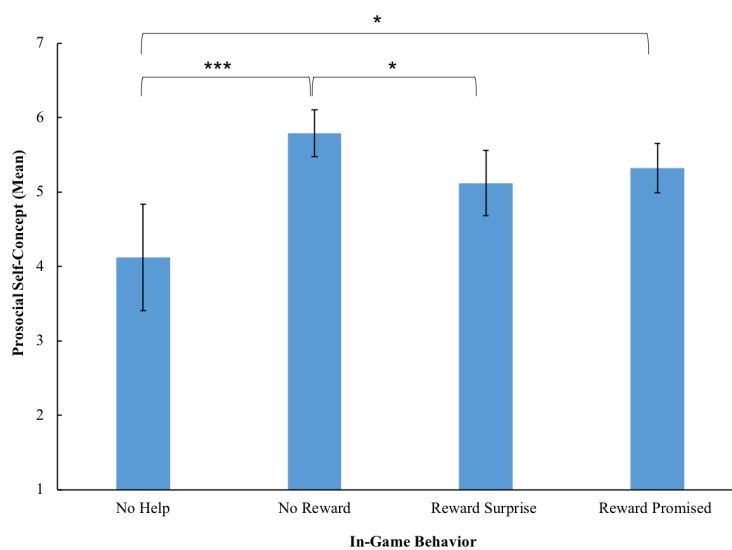


Figure 4: Average prosocial self-concept per condition. Note. * $p < .05$, *** $p < .001$. Error bars represent 95% confidence interval.

4.2.3. RQ1 and RQ2: Donating

Kruskal-Wallis one-way analysis of variance revealed that percentage donated was not significantly different between conditions ($\chi^2 = 6.96$, $df = 3$, $p = .073$, $\eta^2 = 0.04$). Overall, helping participants were more likely to donate (see Figure 5, Table 3), especially if they received no reward, as indicated by a

Pearson Chi-squared test ($\chi^2(3, N = 185) = 7.93, p = 0.048$).

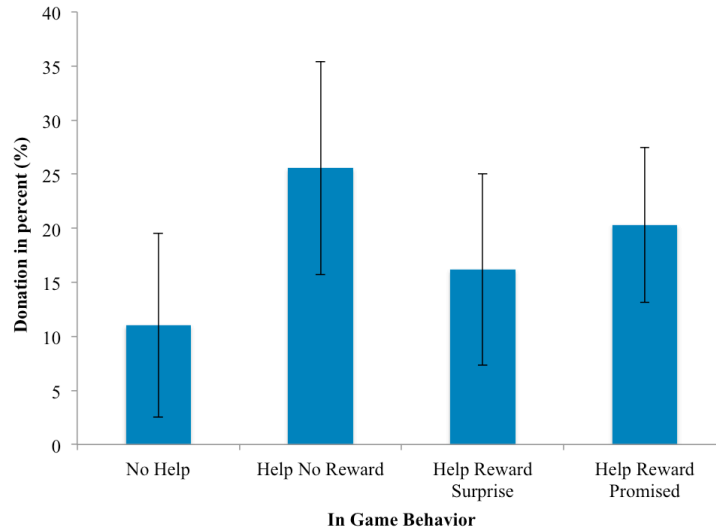


Figure 5: Average percentage donated per condition. Error bars represent 95% confidence interval.

4.2.4. Reasoning for Helping

410 Participants provided mainly strategic and moral reasons for helping, e.g.,
“I assumed that was the only way I was going to escape from the cabin.” (P3,
strategic) or “I like to help people and that man needed assistance. He was
stuck in a house of aliens and zombies. It was also on fire. I was in a position
to provide assistance so I did so. I am a Firefighter/EMT so it is in my nature
415 to assist people.” (P86, moral).

Participants who provided moral reasoning scored higher on prosocial self-
concept ($M = 5.85, SD = 0.95$) than those who provided strategic reasons (M
 $= 4.92, SD = 1.63, t(152.89) = 4.48, p < .001$).

H1: Reasoning and Donation

420 Overall, participants donated more when they provided moral ($M = 22.98\%$)
compared to strategic reasoning ($M = 15.85\%$). Two ordered logistic regressions

Table 5: Participants and percentage donated per condition and reasoning.

Condition	Reason for (no) help	N(%)	Donation (%) Mean (SD)
No Help	Strategic	24 (13.0%)	13.33 (25.14)
No Reward (Helped)	Strategic	16 (8.6%)	28.75 (35.94)
	Moral	24 (13.0%)	20.42 (30.71)
Reward Surprise (Helped)	Strategic	21 (11.4%)	7.62 (17.86)
	Moral	16 (8.6%)	23.75 (35.94)
Reward Promised (Helped)	Strategic	34 (18.4%)	11.18 (25.79)
	Moral	21 (11.4%)	24.76 (23.58)

were conducted with in-game reasoning transformed into two binary codes, one for moral reasoning (1 = moral, 0 = all other reasoning categories) and one for strategic reasons (1 = strategic, 0 = all other reasoning categories). Percentage donated was used as continuous outcome variable. Moral reasoning did not significantly predict percentage donated ($b = 0.57$, $SE = 0.30$, $t = 1.90$, $p = .058$) with an Odds Ratio of 1.77. In contrast, strategic in-game was a significant negative predictor of percentage donated ($b = -0.73$, $SE = 0.30$, $t = -2.46$, $p = .014$) with an Odds Ratio of 0.48.

Two Pearson chi-squared tests confirmed that the decision to donate (yes vs no) was significantly associated with reasoning type (moral: $\chi^2(1, N = 185) = 4.23$, $p = 0.040$, Odds Ratio = 2.01; strategic: $\chi^2(1, N = 185) = 4.42$, $p = 0.036$, Odds Ratio = 0.51). Strategic reasoning predicted whether participants donated, and if so, how much. Moral reasoning predicted whether participants donated.

RQ3: Reward and Reasoning

Using Pearson chi-squared test, we analyzed the count data in Table 5 of participants who had decided to help. Reward was included as dichotomous predictor (0 = No Reward, 1 = Reward Surprise and Reward Promised) and

440 reasoning type as outcome variable: strategic reasoning (1 = strategic, 0 =
all other reasoning categories) and moral reasoning (1 = moral, 0 = all other
reasoning categories). While receiving a reward was not significantly associated
with strategic reasoning ($\chi^2(1, N = 156) = 2.00, p = 0.158$), it was significantly
associated with moral reasoning ($\chi^2(1, N = 156) = 4.57, p = 0.033$, Odds Ratio
445 = 0.44), indicating that reward made participants less likely to provide moral
reasons.

Exploratory Analysis: Reward Expectation

Unlike Study 1, helping participants expecting a reward did not rate them-
selves as significantly less prosocial nor did they donate less than participants,
450 who did not expect a reward (all $p > .05$). Overall, reward expectation was
equally distributed among helping conditions (No Reward, Reward Surprise,
Reward Promised). A Pearson chi-squared test showed that participants ex-
pecting a reward ($n = 58$) provided mostly strategic reasons (84.48%). In con-
trast, participants who did not expect a reward ($n = 74$) provided mostly moral
455 reasons (70.27%), $\chi^2(1, N = 132) = 37.04, p < .001$.

4.3. Discussion Study 2

As in Study 1, participants who chose to help in-game were more likely to
donate (RQ1). In line with findings outside of games research (Warneken &
Tomasello, 2008; Zuckerman et al., 1979), this was only the case if players did
460 not receive an in-game reward (RQ2). Supporting the assumptions of Murphy
& Zagal (2011) and Zagal Zagal (2012), our findings indicate that participants
were more likely to donate if they provided moral reasoning for their in-game
decision (H1). In turn, providing support for earlier similar findings (Kou et al.,
2017; Sicart, 2009; Zagal, 2012), the absence of a reward made participants
465 more likely to provide moral rather than strategic reasons for helping (RQ3).
Finally, empathic concern did not affect the decision to help or donating behav-
ior. It seems that irrespective of empathic concern, game design may influence
prosocial behavior. Specifically, rewarding prosocial in-game decisions was as-

sociated with lower prosocial self-concept and donating. Perhaps, the reward
470 made players perceive their decision as less prosocial, similar to previous re-
search on the undermining effects of rewards on helping motivation (Kou et al.,
2017; Warneken & Tomasello, 2008).

In short, the provision of a reward may shape in-game reasoning for an in-
game prosocial decision, as well as whether this transfers to real-life donating.
475 However, these findings come with two caveats. First, note that arguably all
helping participants received some form of reward in Study 2. While players in
the reward conditions were granted a powerful weapon for helping, – a reward of
facility which promotes mastery and progression (Phillips et al., 2013, 2015), –
players in all conditions (incl. No Reward) received a reward of praise (i.e., “You
480 are a good person”) according to Phillips et al. (2013, 2015). Moreover, games
often provide many different types of rewards, such as rewards of glory (e.g.,
Karma points, Kang et al., 2014), rewards of access (e.g., unlocking new areas),
or sensory feedback (e.g., fireworks accompanied by music, for more examples
see Phillips et al., 2013, 2015). Different types of rewards might hence affect
485 players’ reasoning and subsequent prosocial behavior in different ways. For in-
stance, a reward of facility might make helping more appealing, but promote
strategic reasoning, whereas sensory feedback accompanied by praise might pro-
mote prosocial behavior. Similarly, as ‘cost’ and ‘sacrifice’ are defining aspects
of prosocial behavior (Batson & Powell, 2003), receiving rewards of sustenance
490 (e.g., players gain health points, Phillips et al., 2013) might not increase players’
prosocial self-concept as much.

Second, the interplay of rewards, in-game and real-life behavior may be de-
termined by the (moral) reasons players provide. Following Krmar & Cingel
(2016), we identified strategic and moral reasoning for players’ in-game deci-
495 sion. In our study, moral reasoning mostly concerned that players considered
it ‘morally good’ to care for someone in need. Nonetheless, players may have
different moral reasons for why they act towards other game characters in a
certain way (Krmar & Cingel, 2016). For instance, some players in their study
decided to tell the truth so as not to destroy a relationship with a character,

500 which they categorized as loyalty within the framework of the Moral Foundation Theory (Haidt & Joseph, 2007). Similarly, Ellithorpe et al. (2015) found varying effects on prosocial behavior for moral, yet distinct approaches to in-game decisions (i.e., deontological vs. utilitarian). Future studies should thus investigate whether and how different aspects of moral reasoning impact prosocial behavior
505 in-game and in real life.

5. General Discussion

The aim of the present work was to understand whether and how a voluntary prosocial decision in an otherwise violent game affects subsequent real-life prosocial behavior.¹ Study 1 extends previous findings on the effects of prosocial/violent games on prosocial behavior (e.g., Greitemeyer & Mügge, 2014; Greitemeyer & Osswald, 2010; Greitemeyer et al., 2012) by showing that players act in a morally consistent manner in real life after voluntarily choosing to help in-game. Study 2 further expands these findings by showcasing the effects of game rewards and reasoning.

515 Mimicking many popular video games (e.g., the Mass Effect, Fallout, or BioShock series), our game combined violent and prosocial content. While our study cannot show whether our game would be ‘less harmful’ than a purely violent or ‘more helpful’ than a purely prosocial game (Greitemeyer & Mügge, 2014), our findings suggest that even a single prosocial decision among numerous
520 violent events, can have a positive transfer effect onto real-life prosocial behavior. Indeed, a promising avenue for future work would be to examine how mixed game content compares to more obviously anti- or prosocial content with regards to real-life behavior.

In contrast to previous studies (Gentile et al., 2009; Greitemeyer & Osswald, 525 2010; Teng et al., 2018), our study used the same game in all conditions, with only the manipulated factors differing (i.e., request for help vs. no request for

¹As a result of both studies 40 nets could be donated to the *Against Malaria Foundation*.

help; reward vs. no reward). At first glance, this stands in contrast to the study of [Tear & Nielsen \(2013\)](#), who examined two games that were comparable in content, but without observing significant differences between conditions. 530 However, while the gameplay was largely identical, the examined games differed with regards to their objective (i.e., save (prosocial) versus kill (antisocial) as many Lemmings as possible). Moreover, [Tear & Nielsen \(2013\)](#) argued that their prosocial game might not have increased prosocial behavior, because players might not have perceived the game as prosocial. In our studies, in contrast, 535 players were presented with the same goals and outcomes, and the reward in study 2 only served to complete the game more quickly. Similarly, the decision to help in-game in our studies increased participants prosocial self-concept, indicating that they indeed perceived the decision as prosocial.

As we only investigated one prosocial in-game decision in a specific game 540 context, the generalizability of our findings to other games remains unclear. Investigating other game design aspects could further validate and extend our results. For instance, one participant mentioned that the NPC appeared strong and suspicious rather than weak. Hence, it would be interesting to investigate whether players' perception of NPCs affect reasoning and prosocial behavior 545 (in-game and in real life) differently. Say, if players learned only after helping the NPC that he was actually antagonistic to the player. Similarly, the addition of a more elaborate game narrative might have influenced participants' behavior and reasoning, as previous studies have found games with rich narratives to be more appreciated ([Oliver et al., 2015](#); [Rogers et al., 2017](#)), which might also 550 promote prosocial behavior ([Myrick & Oliver, 2014](#)).

Next, a limitation of the present work is that prosocial behavior differed markedly between in-game and real life. While we chose the Against Malaria Foundation for its high rankings in independent charity evaluations ([GiveWell, 2016](#); [GivingWhatWeCan, 2016](#)), it was unrelated to the actual content of the 555 game. Future research should investigate whether prosocial behavior might be increased further if the game content and charity domain are more closely related.

A final caveat of the present work is that we focused on a single specific prosocial behavior immediately after game play. To test whether our findings
560 are generalizable, future studies ought to investigate how enduring this transfer effect is, as well as whether it also affects prosocial behaviors other than donating.

6. Conclusion

This work examined the effects of a prosocial in-game decision on subsequent
565 real-life prosocial behavior, as well as whether reward and player reasoning influence this relation. Study 1 showed that players who voluntarily chose to help an NPC donated significantly more to a charity. Study 2 expands on this finding and found that the absence of reward promoted moral instead of strategic reasoning, which increased players' prosocial self-concept and donating behavior.
570 In sum, these findings highlight the role of prosocial video game content and game rewards to shape player reasoning and real-life prosocial behavior.

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Curriculum Vitae

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Higher Education

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Internships

2013 User Research Internship at YouTube, Google Zurich, Switzerland

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Publications

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- 2015 **Iten, G.** (2015). *The impact of Visual Simulations in Statistics: The Role of Interactive Visualizations in Improving Statistical Knowledge*. Heidelberg: Springer Verlag.
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