Red or Blue Pill: Fostering Identification and Transportation through Dialogue Choices in RPGs

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ABSTRACT

Through free choice, individuals can exert control over the environment and experience agency. Research has suggested that tailoring aspects of choice to a player's type can provide benefits; however, commercial Role Playing Games (RPGs) generally provide static opposing options from a spectrum (e.g., paragon versus renegade). To inform the design of choices in RPGs, we conducted three studies comparing configurations of dialogue choices across the morality spectrum in an RPG prototype. Study 1 compared two polar (opposing) choices with two moral or two immoral choices. Study 2 contrasted polar choices with similar choices tailored to the player's morality, modelled from their initial 10 decisions. Study 3 compared polar choices with two tailored and one opposing choice. Our results consistently show that including the opposing choice is important to a player's identification with their character, even when we can reliably predict the decision that they will make.

CCS CONCEPTS

• **Human-centered computing** → *Empirical studies in HCI*;

KEYWORDS

Games, Agency, Decisions

1 INTRODUCTION

Converging evidence from different fields of science agrees that having choices is valuable. Having the ability to choose autonomously allows for people to consciously exert control over the environment, resulting in a satisfied need for control and a feeling of agency [43, 58, 67, 69]. Humans [24, 93, 94] and animals [30, 94] alike prefer having choice over having no choice. Having more options available to choose from increases the probability of the preferred option

being present [69, 77, 78]; however, having too many choices can overwhelm the chooser and decrease satisfaction with the decision [53, 73, 88, 98].

In games, choices are often implemented as a means of increasing interactivity [35, 36, 40, 47]. Role Playing Games (RPGs) in particular, such as the Dragon Age [17] and Mass Effect [16] series, use choices as a tool to give the player control over their character and the narrative world [40]. It has been proposed that for in-game choices to have a positive effect on player experience, they need to give players a tangible outcome or consequence to having made the decision [52, 75]. Some games incorporate a tangible impact by maintaining a model of the player's previous choices to use in tailoring future content (e.g., Mass Effect tracks 'Paragon' and 'Renegade' choices and some options are only available with a high enough score). On the other hand, it has also been proposed that the presentation of the choice itself is valuable, regardless of the outcome [67–69]. In addition to the importance of choice consequences, the meaningfulness of a presented choice has been proposed as important to consider [52, 96, 99]. Previous approaches to create meaningful experiences in games include: tailoring the game narrative to match a player model [99], increasing feelings of social connections [76, 83], and enforcing a commitment to meaning when making decisions [96].

Even though choices are an important tool for enhancing play experience, little is known about the type of choices a player should be presented with, how choices are made by players, and what the resulting effects are on experience. In terms of choice types, many games that offer players a choice provide options that span a spectrum of experience (e.g., choosing between rude or polite dialogue). On one hand, giving players range in available choice should be good as it enhances their perceived freedom (i.e., objective agency) to make that choice. On the other hand, giving players a range in options may not result in as meaningful of an experience as a more carefully constructed subset of more similar options. Research on meaningfulness [99] suggests that tailoring choices to align with a model of previous choices, and therefore providing players with a smaller domain of possibilities from which to choose, can be beneficial.

This idea of providing players with more tailored choices in games is supported by player sentiments. In a review of Mass Effect 3 [16], the game is criticized for moving toward more polarized choices, as opposed to the more nuanced options in previous games [26]. Similarly, a blog post about Dragon Age: Inquisition [17] criticizes the game's decisions for not considering previous choices made by the player or the character's backstory [107].

Designers who wish to create meaningful, transportative, and enjoyable games that include choices have little guidance on the

types of in-game choices that should be presented—*should choices include range or be more similar, but tailored to a player's intended play style?*

In sum, there are two conflicting lines of reasoning. On one hand, psychological research on choice and agency teaches us how important variety in options is and that the feeling of a choice having a tangible impact is crucial. On the other hand, we have literature and player sentiment supporting the importance of a choice's meaningfulness. How do these two perspectives interact? Is a choice as effective, or better, if we reduce the variety of options in exchange for making the choice more meaningful? Given the negative consequences of having too many options [53, 73, 88, 98], it is possible that making choices more meaningful has a higher growth potential for creating more effective decisions in games.

In a series of three studies, we evaluate how different types of choices affect player and narrative experience in the context of a role-playing game prototype. In particular, we compare choices with high objective agency (i.e., moral and immoral choices) with a more meaningful choice option that has less objective agency (i.e., similar morality, Study 1; and tailored to the player model, Studies 2 and 3). Our results suggest that giving the player a wider range of possibilities (i.e., including both moral and immoral choices compared to choices of similar moral valence) is important in fostering player identification and transportation into the narrative—even when the similar options are tailored to the player's intentions. Further, we show that providing meaningful choices with less objective agency (i.e., similar choices) does not harm transportation and identification when the opposing option is also included.

The contribution of our work is twofold: firstly, this paper can help designing decision options in games that positively contribute to player experience. Secondly, the results significantly contribute to the understanding of the underlying processes in a player's experience of choice in games.

2 RELATED WORK

2.1 Perceived Agency and Control

Converging evidence suggests that choice is inherently desirable, even when choice is not linked to the outcome [24, 67, 93, 94]. This is exemplified by the illusion of control, in which merely the possibility to choose results in a higher perception of control over the world [64, 65]. According to a recent review [69], there are three main benefits of choice and subsequently a positive perception of one's control. Firstly, the expected value of having multiple choices is higher compared to having fewer choices, because the likelihood of being presented with a higher-value option increases with the number of available options [3, 102, 105]. Secondly, similar to the learned helplessness paradigm [1, 70], not being able to choose—and therefore not being in control—increases stress [33, 38, 44, 104]. Thirdly, choices tell us something about ourselves. According to the self-perception theory [12] and the dissonance-theory [41], individuals use their choices to infer their own attitude towards something or someone.

Sense of agency is linked to perceived control over one's actions and their consequences in the world. Being an agent can also mean to be able to make a choice. If a positive sense of agency has been established, the outcomes of one's actions are perceived as more positive compared to equal outcomes without the individual's involvement. This phenomenon has been described in the framework of a self-serving bias [25, 48], and has also been reflected in findings showing reduced pain sensation after self-administration of pain or after predictable pain-related cues [9, 29, 37]. Furthermore, it has been suggested that humans select actions based not only on their outcome, but also on their control value (i.e., actions that result in higher control and therefore a higher sense of agency)[58, 87]. This suggests that choices indicating increased control are perceived as inherently rewarding [10, 11, 67]. Additionally, increased control has been associated with increased persistence after failures [2, 13, 42, 66], which is in line with research on the buffering effect of choice on negative emotion and losses [68, 69, 85].

In the context of games this means that aiming to elevate the sense of agency in players might not only enhance their enjoyment of the game, but is likely to increase their playtime and perseverance after in-game failures.

2.2 (Tailoring) Meaningful Choices in Games

Games, more than any other form of media, enable the player to choose and exert control over their experience, and although choices are a ubiquitous game dynamic, little research has been done on the effect of specific types of choices. Most recently, Iten et al [52] set out to investigate the effect of meaningful, moral choices on player experience, enjoyment and narrative engagement. They reported that for choices to be perceived as meaningful, the choice had to have tangible consequences (for similar arguments see [89, 101]).

This need for players to witness the consequences of their in-game choices aligns with other research into choices and agency in games. In particular, previous work has argued that choices in games should be designed with a commitment to meaning in mind. [96] Specifically, when players make a choice, they are creating a commitment on behalf of the player character. In order for this commitment to make sense, and to make the player feel as though their choices matter, the game system should adapt to hold the player accountable to the decisions they have made in a type of social contract.

Previous work has also shown that player experience can be enhanced by using player choices to build a computational model of players' preferred playstyle and tailor the game's narrative or decisions based on this model. [72, 82, 99]. In this system, individual play styles were modelled using five-dimensions: Fighter, Power Gamer, Tactician, Storyteller, and Method Actor. Player choices were tagged with values for each of these dimensions. When a player made a choice, their model was updated by adding the corresponding scores from the choice. Future content was then tailored based on the player's current model. This tailored storytelling is similar to a method employed in serious game design in which personalized feedback and information is used to promote behavioural change [62, 63].

2.3 Narrative Experience

Narrative experience has many facets but for the purpose of this paper, we discuss three major dimensions: Transportation, Narrative Engagement and Identification.

Transportation refers to the sensation of leaving your physical surroundings and being immersed in the narrative world [46]. The personality trait of Transportability—i.e., the individual propensity to be transported—has also been shown to predict Transportation [14, 32].

Narrative Engagement[27] is based on four different processes: narrative understanding (i.e., cognitive perspective taking and making sense of the story), attentional focus (i.e., undivided attention for the story), emotional engagement (i.e., empathy for the characters) and narrative presence (i.e., the sensation of having entered the narrative world).

Narrative engagement can be explained in the framework of mental models, which are cognitive representations of aspects of the external world and influenced by an individual's experiences [55, 56, 103]. For example, an individual might have a mental model of the earth containing shape and size. Similarly, a mental model of a story may contain, among other things, the chronological sequence of events and the spatial setting. Therefore, it was argued that narrative engagement is rooted in an individual's mental model of a certain story. [14, 108].

Identification refers to the sensation that the player experiences the game from the character's point-of-view [34]. Identification (with the character) has three main dimensions [100]: similarity identification (i.e., feeling to the character), embodied presence (i.e., taking the character's perspective) and wishful identification (i.e., the character is a desired version of the player). Identification has been shown to foster intrinsic motivation [18, 19].

3 SYSTEM DESCRIPTION

We present three studies in this paper. All three studies use an interactive dialogue system that maintains a morality model of the player based on their decisions, and tailors future choices based on this model. We briefly describe how the system and dynamic model are created and maintained.

3.1 Morality Model

In order to tailor the options presented to individual players, we first created a model to be able to predict a player's choice. Given that the players would be making dialogue choices we elected to use a model of morality, based on Moral Foundation Theory [49] which has been previously used in games research [52, 61]. Our model consisted of the five primary axes of Moral Foundation Theory: Care/Harm, Fairness, Loyalty, Respect, and Purity. The player model consisted of a score for each of these five axes, as well as a combined score for overall morality.

Each dialogue option a player could choose was tagged with a score for each of the five axes. When the player made a choice, their model was updated by adding the vector from the option to their morality model.

After a short calibration phase of making decisions (we used the initial ten decisions), the player model at that time was saved and this was the model used by the system to tailor the decisions presented to the player.

Figure 1: Screenshot of narrative system used in studies 1, 2, and 3.
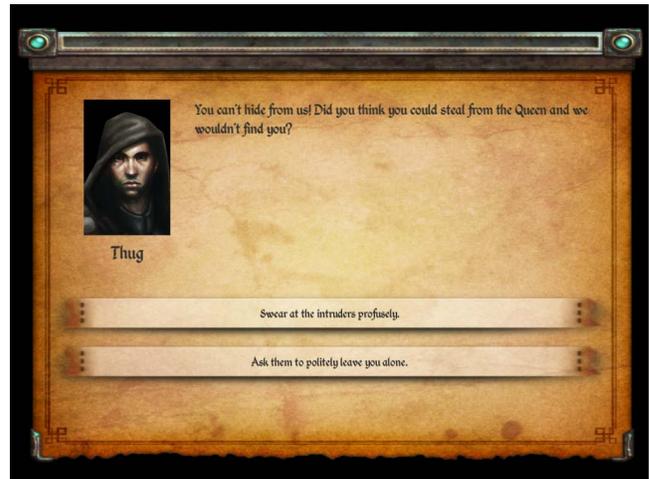
3.2 Narrative System

We constructed an interactive dialogue system that allows players to play through a text-based adventure. The system can be configured with various rules and constraints to procedurally construct and present players with a set of options by combining predefined sentence fragments. Each fragment is tagged with the moral axes as described in the previous section. The system assigns a morality score for each generated option, and automatically updates the player model when a choice is made by the player.

The dialogue system leads players through an interactive narrative that follows a young roguish mage on an adventure that centered around performing a job for her estranged mother. The story dealt with complex relationships between the protagonist and her mother, as well as the protagonist and an old friend named Ember with whom things had ended badly. The story focused on themes of forgiveness, trust, and betrayal. Throughout the story there were 72 story fragments that players clicked through. Out of the 72 fragments, 35 were decisions that the player had to make, including both dialogue options and actions to move the story forward. See Figure 1 for a screenshot of the game.

3.3 Dialogue Choices

Though the system supports more complicated procedural construction of options, we elected to write the possible options by hand to limit the variance in experience between participants. For each decision, we created two versions of a moral option, as defined by our morality model, and two versions of an immoral option. We ensured the two versions differed in content and the specific moral axes they were tagged with (e.g., one moral option may involve purity and the other may involve fairness), but the resulting options all had approximately the same morality score so the decisions were as balanced as possible.

We used the following guidelines when tagging the dialogue options with the moral axes:

Harm/Care : Options were tagged with this axis if the choice resulted in the character attempting to physically harm or protect another character. (e.g., throw a fireball at an enemy or stand in front of a character to protect them from danger).

Fairness/Reciprocity :Options were tagged with this axis if the choice involved the character acting fairly or unfairly to another character (e.g., performing a sneak attack or admitting that you are wrong).

Ingroup/Loyalty : Options were tagged with this axis if the choice involved the character acting loyally or disloyally towards their mother or friend, Ember (e.g., obeying her mother).

Authority/Respect : Options were tagged with this axis if the choice involved the character treating her mother or Ember with respect or disrespect. (e.g., insulting Ember).

Purity/Sanctity : Though this axis is traditionally associated with aspects such as chastity or hygiene, we used this axis to measure purity as was relevant to the narrative content, namely how the character feels about dark magic, which was foundational to the plot. (e.g., whether or not the character uses an amulet full of dark magic or decides to destroy it.).

For the first ten story pieces, players were all presented with the same two options, in order to calibrate the individual player model. These decisions consisted of a moral option and an immoral option, and they evenly included a mix of all five moral axes as defined in our model.

After the calibration phase, when presenting a decision to the player, the system randomly selected from the pool of generated options to fulfill one of several rules:

POLAR : One option had positive morality (i.e., moral choice), one had negative (i.e., immoral choice).

MORAL : All of the options had a positive morality.

IMMORAL : All of the options had a negative morality.

TAILORED : All of the options had a morality that aligned with the calibrated morality model.

Once the options were chosen, they were presented to the player in a random order to eliminate sequence effects.

4 RECRUITMENT, OUTLIERS, AND BOT DETECTION

For all studies presented in this paper, we recruited participants from Amazon's Mechanical Turk, which has been shown to be a reliable research tool [71]. Due to recent concerns of data validity and an increase of bots on the platform [92], we employed strict filtering procedures to detect and remove outliers, inattentive participants, and bots from our data.

We removed all participants that displayed zero variance in their answers on any of the questionnaires to detect participants who just clicked the same answer on a Likert-scale on every single question. We also removed participants who spent more than three standard deviations longer or shorter than the mean on more than one questionnaire to remove participants that clicked through questionnaires too quickly and participants that were multitasking, or who left the study window open in their browser while doing something else. Finally, we asked several broad questions regarding the narrative to ensure participants had read and understood the story. Participants who didn't answer the question we had asked (e.g.,

when asked about the character's morality some bots replied by defining morality based on a web search) were removed. We describe how many participants were removed in each individual study description.

5 STUDY 1

RPGs generally present players with a spectrum of options (e.g., players can choose between a polite response and a rude response). In the case of the dialogue system we created, a presentation of one moral choice and one immoral choice reflects the way in which games currently present choices to players.

Previous work in the context of persuasive games has argued that a game is most persuasive when players have to invest mental effort into making a choice as opposed to picking options for the sake of picking options [106]. Applying this in the context of moral choices, a choice that requires more mental effort to make a selection should be more persuasive, which leads to positive outcomes [39, 79, 80].

We propose that a choice with both options on the same end of the moral spectrum would require players to exert more cognitive effort into making the choice. By making the choices similar, we reduce any preference biases so players are forced to choose between two things they feel similarly about.

The goal of Study 1 was to compare POLAR choices (one moral and one immoral option) with MORAL (two moral options) and IMMORAL (two immoral options) in a between-subjects study design with 90 participants, using the recruitment approach described in the previous section.

5.1 Measures

Here we present the constructs we measured, along with the number of items and Cronbach's alpha for each subscale.

5.1.1 Trait Measures.

Transportability : Transportability (21 items, $\alpha = .903$), or an individual's trait susceptibility to be transported into a narrative world, was measured using the Transportability scale [14].

Sense of Agency (SONA, SOPA) : We measured an individual's sense of negative agency (SONA) (7 items, $\alpha = .925$) , and sense of positive agency (SOPA) (5 items, $\alpha = .836$), using the Sense of Agency Scale [97].

Moral Foundations Questionnaire : An individual's affiliation with the five axes of Moral Foundation Theory [49] were measured using the short version of the Moral Foundation Questionnaire (MFQ) [45]. (Care/harm (4 items, $\alpha = .657$), Fairness (4 items, $\alpha = .696$), Loyalty (4 items, $\alpha = .692$), Respect (3 items, $\alpha = .827$), Purity (4 items, $\alpha = .885$)).

5.1.2 State Measures.

Transportation : The amount participants were immersed in the narrative world was measured using the Transportation scale (11 items, $\alpha = .637$) [46].

Autonomy : Perceived Autonomy (3 items, $\alpha = .886$) was measured using the autonomy subscale from the Player Experience of Needs Satisfaction Scale (PENS) [86].

Effort : We measured Effort (4 items, $\alpha = .798$) using the Effort-Importance subscale of the Intrinsic Motivation Inventory (IMI) [74].

Figure 2: Estimated Means±SE for Studies 1, 2, & 3. Values of co-variates for each study are shown in bottom right.

	Study 1			Study 2		Study 3	
	Polar	Positive	Negative	Polar	Tailored	Polar	Tailored2.0
Transportation	4.89(.10)	4.87(.10)	4.58(.10)	4.88(.10)	4.54(.10)	4.80(.11)	4.67(.10)
Identification	4.68(.22)	4.73(.22)	3.69(.22)	4.45(.17)	3.85(.18)	4.34(.18)	4.18(.17)
Autonomy	5.37(.25)	5.46(.24)	5.27(.25)	5.13(.21)	5.14(.21)	5.03(.20)	5.39(.19)
Effort	5.83(.15)	5.86(.16)	5.41(.16)	5.83(.14)	5.37(.14)	5.74(.15)	5.73(.14)
Enjoyment	5.59(.20)	5.72(.19)	5.27(.20)	5.44(.17)	5.39(.17)	5.36(.20)	5.32(.19)
Similarity	4.68(.27)	4.56(.22)	3.62(.29)				
Embodied	5.17(.22)	5.31(.22)	4.26(.23)				
Wishful	4.20(.26)	4.50(.26)	3.16(.27)				

S1. Trans=5.25, SOPA=5.43, SONA=2.50, MFQ=4.07
S2. Trans=5.21, SOPA=5.49, SONA=2.33, MFQ=3.82
S3. Trans=5.12, SOPA=5.35, SONA=2.36, MFQ=3.80

Enjoyment : We measured enjoyment (5 items, $\alpha = .839$) using the Enjoyment/Interest subscale from the IMI [74].

Identification : Player Identification with the main character was measured using the Player Identification Scale [100], which measures three constructs: Similarity Identification (6 items, $\alpha = .927$), Embodied Presence (6 items, $\alpha = .930$), and Wishful Identification (5 items, $\alpha = .901$), and can be combined into a single measure of character identification [100].

Narrative Compliance Checks : To ensure participants read and understood the story, which was necessary to consider their responses, we asked several open questions regarding the narrative. Participants were asked to summarize the plot, list the name of the protagonist, describe whether they made decisions as themselves or as the character, and describe the protagonist's morality.

5.2 Data Analyses

Because we have less control over behaviour on MTurk, we need to remove participants who do not actually read the story or consider their responses (i.e., by just click through) and try to detect bot participants [92]. To do so, we calculated the variance in responses on each page of questions, and removed any particpant who displayed a variance of 0 (e.g., clicked the middle bubble for each question). Additionally, we calculated the time spent on each questionnaire and removed any participant that was greater than 3 SD above or below the mean on more than one questionnaire (e.g., clicked through multiple questionnaires without reading or spent a large amount of time multitasking on another browser window).

In total we removed 11 participants, leaving 79 participants remaining in the dataset for analysis ($N_{polar} = 26$, $N_{moral} = 28$, $N_{immoral} = 25$).

We then conducted partial correlations of the trait variables (i.e., Transportability, SOPA, SONA, MFQ) with the state variables (i.e., Transportation, Identification, Effort, Enjoyment, Autonomy). Because the trait measures often correlated with the state measures, we included them as co-variates in our analyses.

We conducted a multivariate analysis of co-variance (MANCOVA) with choice (polar, moral, immoral) as a between-subjects factor, and transportability, SOPA, and SONA as co-variates on the dependent measures of Transportation, Identification (Similarity ID, Embodied ID, Wishful ID), Effort, Enjoyment, and Autonomy. Mediation analyses were conducted with Process 3.00 in SPSS 25.

5.3 Results

The MANCOVA showed significant effects of choice on Similarity ID ($F_{2,73} = 4.2, p = .020, \eta_p^2 = .11$), Embodied ID ($F_{2,73} = 6.1, p = .004, \eta_p^2 = .15$), and Wishful ID ($F_{2,73} = 6.5, p = .003, \eta_p^2 = .16$). There was also a significant effect of choice on Transportation ($F_{2,73} = 4.1, p = .021, \eta_p^2 = .11$).

Bonferroni-Holm corrected pairwise comparisons showed that participants in the immoral condition experienced less similarity identification, embodied identification, wishful identification and transportation than participants in the polar or moral conditions (all p<.05).

In terms of experience, there were no main effects of choice on Autonomy ($F_{2,73} = .06, p = .944$) or Enjoyment ($F_{2,73} = 1.9, p = .165$), but was a significant effect on Effort ($F_{2,73} = 5.2, p = .008, \eta_p^2 = .13$). Bonferroni-Holm corrected comparisons revealed that participants felt they invested less Effort in the immoral condition than moral or polar (all p<.02).

Additionally, we calculated overall identification, as all identification measures showed the same trends. Results were in line with the subscale results for identification. We used this measure to determine if invested effort mediated the effects of condition on identification (controlling for the same co-variates as in the MANCOVA). We found that choice predicted identification (p=.003), but that effort did not (p=.057); further, including effort in the model did not significantly reduce the direct effect of choice on identification (p=.009).

To determine whether the variance in identification and transportation could be explained by the differences in invested effort, we conducted mediation analyses, which investigates whether a latent mediating variable (M) explains the variance predicted between a predictor (X) and a dependent measure (Y) [21]. Because we must use dichotomous predictors [21] and we had three conditions, we just considered the polar and immoral conditions. We first modeled whether the prediction of choice-condition on identification was mediated by effort, and second whether the prediction of choice-condition on transportation was mediated by effort. Choice predicted identification ($\beta = .496, p = .005$) and remained a significant predictor, even when effort was included in the model ($\beta = .431, p = .017$). Further, the confidence interval for the indirect effect included zero (LLCI=-.226, ULCI=.012), suggesting that there was no mediation [21]. In terms of transportation, choice predicted transportation ($\beta = .172, p = .012$) but did not remain a significant predictor when effort was included in the model ($\beta = .118, p = .062$). Further, the confidence interval for the indirect effect did not include zero (LLCI=-.126, ULCI=-.001), suggesting that there was a partial mediation [21].

Finally, we were concerned that participants may have been randomly assigned to a choice condition that did not align with their preferred morality to play. Because the first 10 decisions were polar in each condition, we used those choices to calculate a predicted morality. In the moral condition, 11 participants were predicted to play morally and 17 were predicted to play immorally; in the immoral condition, 12 were predicted to play immorally, and 13 to play morally. The relatively similar distributions suggest that it is not a mismatch between intended playstyle and assigned condition

that drives the lower transportation and identification in the immoral condition; however, that our experiment was not designed to test this hypothesis (and group sizes were too small to look for interaction effects) means that we can only postulate that mismatch is not responsible for the results.

5.4 Study 1 Discussion

Results of study 1 revealed that participants presented with only immoral options reported significantly lower identification on all subscales compared to the moral choice or polar conditions. Results were robust even when combining all identification subscales into one measure. Further, transportation—the metric that describes engagement from narratives—was also lower in the immoral condition. Finally, participants reported a lower subjective effort in the immoral condition. Also, we found that effort mediated the effect of choice on Transportation, but not on Identification.

Surprisingly, no differences in perceived autonomy were observed. We can explain this in that participants always decided between two options, and that in the specific case of our experiment design, experienced autonomy was not significantly affected by whether those choices were similar and moral, similar and immoral, or polar in their morality.

Unsurprisingly, there were no differences in overall enjoyment. We did not expect differences, as previous work showed that differences in identification and transportation do not translate into differences in enjoyment within narrative prototypes [23]. Although players may differently identify with the protagonist, and may experience greater transportation into the narrative, the enjoyment was measured as regarded the experience overall. It is not expected that differences in narrative transportation would result in differently-rated enjoyment of the experience in short-term engagement with a narrative prototype.

However, there are questions raised by our results. Specifically, participants were randomly assigned to conditions, thus the similarly-valent options (i.e., only moral or immoral options) were not matched to the player's moral-compass. One could argue that the decision between two equally valenced options was not difficult because we did not control for the individual's preferred decision-pattern.

6 STUDY 2

In Study 1 we showed that when presented with only immoral options, participants tended to identify less with their character and were less transported by the narrative than if given only moral options or one of each. Because participants were randomly assigned to the polar, moral, and immoral conditions, the presented choices may not have been meaningful if they did not align with the character's personality, as played by the player. Our additional analyses showed the preferred morality as predicted by the initial 10 polar choices was not in line with the randomly-assigned condition; that is, approximately half of the participants in the moral and immoral conditions likely had a preferred morality that was incongruent with their assigned condition.

Our goal of Study 2 was to determine if polar or similar choices yielded a better experience, in a situation in which the similar choices were tailored to the participants' preferred playstyle as predicted by their morality decisions.

6.1 Methods

We replicated the experimental design and analyses of Study 1, but instead of assigning participants to the moral and immoral options, we chose the moral or immoral path based on their initial 10 choices. As such, we randomly assigned participants to either the polar (presented polar options) or tailored (two moral options or two immoral options depending on their initial 10 choices) conditions.

To increase statistical power, we raised the number of participants in each condition from 30 to 50, with a total of 100 participants. We collected the same measures as in Study 1 and conducted the same data analyses. From the initial 100 participants, we removed 23 for non-compliance as described in Study 1, leaving 39 in the polar condition and 38 in the tailored condition. The reason there were significantly more participants removed in Study 2 compared to Study 1 was primarily due to an increase in bots on the platform the day we ran Study 2. As described in the earlier section, participants were asked questions relating to the content of the story, and participants that did not demonstrate a basic understanding of the questions being asked (e.g., when asked to define the plot of the narrative, some participants defined the terms *plot* or *narrative*) were removed. In total, we detected 8 participants who were likely bots using this method. The only difference in Study 2 is that we present the combined avatar identification measure for brevity, as the sub-scales all showed the same patterns [100].

6.2 Results

The MANCOVA (with transportability, SOPA, SONA, and MFQ included as co-variates) showed main effects of choice on identification ($F_{1,71} = 5.7, p = .019, \eta_p^2 = .08$), transportation ($F_{1,71} = 5.3, p = .024, \eta_p^2 = .07$), and effort ($F_{1,71} = 4.9, p = .030, \eta_p^2 = .06$). As Figure 2 shows, polar choices yielded greater identification, transportation, and effort than tailored ones.

There were no effects of choice on autonomy ($F_{1,71} = .004, p = .953$) or enjoyment ($F_{1,71} = .04, p = .839$). We again conducted mediation analyses. We first modelled whether the prediction of choice-condition on identification was mediated by effort, and second whether the prediction of choice-condition on transportation was mediated by effort. Choice predicted identification ($\beta = .600, p = .019$) and remained a significant predictor, even when effort was included in the model ($\beta = .546, p = .039$). Further, the confidence interval for the indirect effect included zero (LLCI=-.401, ULCI=.086), suggesting that there was no mediation [21]. In terms of transportation, choice predicted transportation ($\beta = .335, p = .024$) but did not remain a significant predictor when effort was included in the model ($\beta = .191, p = .164$). Further, the confidence interval for the indirect effect did not include zero (LLCI=-.367, ULCI=-.014), suggesting that there was a partial mediation [21].

Based on the negative effects of the immoral condition in Study 1, we considered that the participants who were tailored to the immoral condition may have been driving down transportation. In the tailored condition, there were 21 participants assigned to the immoral condition and 17 assigned to the moral condition (based on their initial 10 decisions). Looking at the mean values of transportation though, participants experienced the greatest transportation in the polar condition (4.88), followed by the immoral tailored (4.66), and then moral tailored (4.40) conditions, suggesting

that it was not the immoral decisions harming experience in the tailored choice conditions.

6.3 Study 2 Discussion

Participants presented with polar decisions reported higher ratings of identification, transportation and effort. There was no significant effect of choice-condition on perceived autonomy or enjoyment. Further, mediation analysis showed that, in line with Study 1, effort mediated the influence of choice-condition on transportation, but did not predict identification or mediate that relationship—i.e., even when controlling for effort, the prediction of choice-condition on identification remained significant.

Interestingly, the tailored conditions again did not affect the perceived autonomy, which could be explained in that participants experienced the reduced effort instead of a lack of real choice. In study 3, we explore the effect of an option providing the best of both worlds: a meaningful choice between two options of the same morality, while also giving the option to choose the polar-opposite.

7 STUDY 3

Study 1 showed that polar and moral choices yielded higher transportation, identification, and invested effort than immoral ones. Study 2 showed that similar, but tailored, choices yielded lower transportation and identification than polar ones. Based on the results from the first two studies together, we hypothesized that the reason that we saw reduced experiences with tailored choices, and why we did not see differences in perceived autonomy, was that by tailoring choices to align with the participants' model, we took away the option that went against their model. As discussed in Study 2, there are reasons to expect that not having the choice that one wants to discard can harm experience.

To investigate whether the absence of the not-desired choice reduced identification and transportation, we adapted the tailored condition to present participants with three choices: two that aligned with their model and one that opposed. In this way, we maintain the tailored options and provided players with a meaningful choice, while also providing them with the option to deviate from the model, and not make the non-desired choice.

7.1 Methods

We replicated the experimental design and analyses of Study 2, presenting a tailored (two moral-one immoral or two immoral options-one moral depending on their initial 10 choices) condition. We gathered 50 participants. We collected the same measures as in Studies 1 and 2 and conducted the same data analyses. We compare the results to the polar condition from Study 2 as participants were randomly recruited and Study 3 was gathered the day after Study 2. We removed 7 for non-compliance as described in Study 1, leaving 43 in the tailored 2.0 condition.

7.2 Results

The MANCOVA (with transportability, SOPA, SONA, and MFQ included as co-variates) showed no main effects of choice on identification ($F_{1,76} = .47, p = .494$), transportation ($F_{1,76} = .74, p = .392$), effort ($F_{1,76} < .001, p = .994$), autonomy ($F_{1,76} = .1.7, p = .194$), or enjoyment ($F_{1,76} = .026, p = .873$).

7.3 Study 3 Discussion

In Study 3, we adapted our tailored condition from study 2 into a new tailored 2.0 version to provide two similar options and one opposing option, to provide players with a meaningful model while still giving the option to customize the character's personality. Results show that there was no significant difference between the conditions on any measure (i.e. Identification, Transportation, Effort, Autonomy or Enjoyment). Thus, the tailored 2.0 decision condition in Study 3 significantly improved on the tailored condition of Study 2.

One limitation of study 3 lies in the fact, that in the tailored 2.0 condition has a confound. We cannot disentangle, in the current study design, whether the higher identification and effort were due to an increased number of options (i.e., from two to three) or the addition of the opposing choice. But participants again reported no difference in perceived autonomy, which might suggest that adding a third option did not significantly change their perception of their decision. Therefore, we propose that the difference found in Study 2 was due to the lack of alternatives and not the addition of one more option to pick from.

8 GENERAL DISCUSSION

In the following sections, we summarize our results and discuss in detail their limitations and implications.

8.1 Summary of Results

8.1.1 Study 1. In Study 1, we showed that participants identified with their character less when only given the option to act immorally, compared to given only moral options or given a choice from both ends of the spectrum. Furthermore, transportation and effort were both also lower in the immoral condition. Invested effort mediated the effect of choice on transportation, but not on identification.

8.1.2 Study 2. In Study 2, we showed that even by tailoring the choices to align with the morality that participants established with their character in the initial 10 decisions, they still experienced lower identification, effort, and transportation than when given the options. Also, participants perceived effort mediated the influence of choice on transportation, but effort did not significantly mediate the prediction of identification through choice.

8.1.3 Study 3. In Study 3, we updated the tailored option to also include the opposing (polar choice) and saw the effects from the first 2 studies go away, indicating that our updated tailored model was no worse than two polar options. Also, because we found no differences in Study 3, we have some confidence that the reason our tailored model produced lower identification in Study 2 was due to the absence of an alternative option that participants did not wish to choose.

8.2 Explanation of Results

Over three studies, we consistently show that the inclusion of the opposite choice is important and shows two robust effects. First of all, identification with the character increases. Secondly, effort increases and effort significantly mediated the corresponding increase in transportation.

With regard to identification, the decreased identification after being presented with only immoral options can be explained in the context of a self-serving bias [51] and a self-enhancement bias [90]. Both biases serve an individual for the purpose of maintaining self-esteem [20, 54]. In situations of self-threat [8]—a situation in which positive views about oneself are contradicted or otherwise threatened—preserving one's self-esteem is especially important [28]. Transferred to the context of games, participants may have rated their identification lower with a character that could only make immoral choices, because their view of themselves is generally positive; whereas identification was not impeded in either the polar, moral, or tailored 2.0 decision conditions, because they all provided a moral option to choose from. Following a similar line of reasoning, higher identification ratings in the polar and tailored 2.0 condition (and lower ratings in the tailored condition) could have resulted from a drop in self-efficacy [4, 7]. Self-efficacy refers to the general personal belief in one's abilities to exert control over the environment [59]. Generally, a positive view of one's self-efficacy is highly adaptive and crucial for well-being and psycho-social functioning [6, 85, 91]. Self-efficacy and the perception of control are linked to the perception of being able to choose freely [5, 69], which was only the case in the polar and tailored 2.0 conditions. When being presented with tailored options of the same morality, essentially only one choice is displayed, and this could lead to the perception that it is not possible to make the right choice given any situation, which in turn lowers self-efficacy.

Moreover, the significantly higher ratings of transportation in the polar and the tailored 2.0 conditions can be explained by its similarities to real-life decision making and to familiar game design. Realism has been reported as linked to increased transportation [15]. Further, transportation has been shown to be influenced by characteristics of the narrative that enhance suspense [95] and the perception of personal relevance [81]. Additionally, we found and replicated a significant mediation by perceived effort of choice on transportation but not on identification. This means that effort drives transportation but not identification. Or put differently, an increased effort leads to higher transportation—a measure for narrative enjoyment.

8.3 Reliability of the Prediction Model for Tailored Choices

We see that in the POLAR conditions for Study 1 and Study 2, the model generated by the system fairly reliably predicts the final morality model. For Study 1, the correlation between the actual and the predicted model was $r = .767$, $p < .01$, N = 26. For study 2, it was $r = .794$, $p < .01$, N = 40. Thus we assume that the model actually tailored the choices correctly based on the players' decision used for calibration.

8.4 Autonomy vs. Agency & Trait vs. State

Autonomy and agency are terms that are often used interchangeably, but we argue in this section that autonomy and agency are two distinct constructs.

On one hand, autonomy as a state in games is usually measured using questions like "I experience a lot of freedom in the story." or "The story provides me with interesting options and choices." [86].

On the other hand, agency as a trait can be measured by high-level questions about the participant's life or the story in general with questions like "I am in full control of what I do.", "The things I do are subject only to my free will" and "I am responsible for what I do." [97].

Although both questionnaires contain choices, autonomy refers more to a perception of having options, while agency reflects the perception of having not only a choice but also that one has control over the decision and that choice has a consequence. We argue that our manipulation did not have an effect on autonomy because players were always free to make a choice, but their sense of agency may have been manipulated and an appropriate measurement of their state agency could have resulted in additional proof for our claims.

This might help explain why in our state measure of autonomy, we did not find an effect but an appropriate state measure of agency might have been affected by the different decision options. There are, to the best of our knowledge, currently no validated scales available that measure agency as a state, which might have been a crucial outcome variable to explain the experience of choices in the present study.

8.5 Game Design Considerations

Our results suggest that including a variety of choices (e.g., a mix of both moral and immoral) is important to a player's identification with their character. Additionally, we see that having a variety of choices also led to higher transportation, but this was mediated by perceived effort. This implies several important considerations for game designers.

First, our results suggest that when presenting options to players, giving them varied options should lead to higher identification with the character (e.g., giving the option for bright pink hair in an avatar creator instead of limiting the choices to shades of brown).

Second, our results suggest that a variety of choices is helpful in fostering transportation, partically because they lead to a higher investment of effort in making the decision. This suggests that while a variety of customization options are important for fostering identification, the important design aspect for transportation is the perceived effort of the choice. This means that game designers should create decisions in such a way as to force the player to expend cognitive effort, rather than giving choices that the player will easily make without any consideration.

Finally, it is important to caution designers against giving players too many choices. As described earlier, previous work has shown that too many choices can lead to feelings of dissatisfaction with a choice [52, 73, 88, 98]. Also, the addition of a third choice in Study 3 did not significantly change any of our measures compared to the polar condition, which suggests that it may not be the number of choices that are important, but instead the variety.

8.6 Limitations

There are four limitations to our study that have to be addressed. Firstly, we did not measure agency as a state. Although surprising, to our knowledge there are no validated measures available to measure agency as a state, and given the background of the current literature, we opted to measure autonomy instead. Reformulating

the trait questions or a similar questionnaire (e.g., self-care agency scale [60]) would be an option in future studies to explore effects on state agency as a result of in-game decisions.

Secondly, perceived effort showed a significant effect in Studies 1 and 2 but the construct is fairly non-specific and rather broad. Questions in the IMI Effort subscale [84] include ones like "I put a lot of effort into this game." and "It was important to me to do well at this game." If we had measured cognitive workload using for example the NASA-TLX [50], we may have been able to unpack more specific effects. With that being said, the self-reported effort of participants did significantly mediate the relationship between choice condition and transportation in both Studies 1 and 2.

Thirdly, though previous work has shown that a low-fidelity narrative prototype can reasonably predict the narrative and play experience of a high-fidelity game using the same story [23], the prototype we used in the studies presented was only used by participants for a short amount of time and the conditions under which they played (i.e., under a controlled study as opposed to for enjoyment under their own volition) were different than that of a commercial game. As such, we can be reasonably confident that our results could be extended to a higher-fidelity interactive narrative, but the mechanisms of choices related to things besides dialogue choices (e.g., choices involving upgrades, choosing which quest to undertake, and customizing the appearance of the main avatar) are beyond the scope of this paper. We would expect similar results from studying other types of choice, but further research is needed to verify this.

Lastly, it is unclear from the design of Study 3 whether the results can be attributed to the presence of the alternative and opposing option or the fact that there was one additional option presented (i.e., 3 instead of 2 in the control condition). We considered this issue when designing the study; however, including 3 options in the POLAR condition would be difficult as there is no natural valence for the 3rd option, and it would not be comparable to the previous POLAR condition used. Given the results of the study-series together, and the non-significant difference in state autonomy when provided with the additional (i.e., 3rd) choice, we propose that only providing one additional option did not affect the player experience. Rather over the course of three studies, we reliably showed that having the polar choice was the driving force behind the effect.

8.7 Future Research Directions

The findings in the present study open new lines of potential research. Most importantly, the present study highlights the need for a state agency questionnaire that can be used in HCI and games research. Such a scale could be used to provide important information about player experience and how much players feel they are in control over their environment.

Further, several experimental manipulations should be considered by researchers to further explore the effects of different types of choices. One could argue that it would significantly alter the player experience if it was transparent that their choices are being modelled and predicted throughout the gameplay. Also moral dilemmas instead of polarized choices, could be used in order to provide more difficult choices. But the research of moral choices

is not without its difficulties and there are several inter-individual differences that influence moral choice [31, 57].

Finally, based on the present paper, three additional game design elements could be investigated. Firstly, researchers could evaluate the effects of a branching dialogue system on the sense of agency in the moment. A dialogue system like this might provide a stronger sense of agency by having natural consequences to individual choices participants have made. Participants could even be required to re-play the same game in order to notice the branching dialogue tree. Secondly, a colour-feedback system could be implemented to help offload cognitive load of the player in making decisions, similar to commercial games that employ polar choices. Previous work has shown that altering the colour of text can significantly alter player experience [22]. It is possible that highlighting moral and immoral choices could function similarly, providing players with visual feedback to confirm and strengthen the perceived morality of a choice. Thirdly, researchers might want to look into pacing by only giving players choices that align with their individual model, while occasionally providing players with opposing choices to manage their narrative experience curve. This would also require some form of repeated online measurement of the players' experience to in order to model their ideal moral curve for narrative experience.

9 CONCLUSION

Choice is inherently important to individuals and valued highly. Through choice, individuals can exert control over their environment and become autonomous agents. In games, especially in RPGs, the player is often confronted with plenty of decisions, through which they can shape their character and experience. In a series of three studies, we tested the effect of polar choices against various other choice-configurations (i.e., moral/ immoral in study 1, tailored in study 2 and tailored 2.0 in study 3). Our results across studies consistently showed that including the opposing choice is important to foster a player's identification with their character and their transportation into the narrative. These results still hold true even when a player's decision behaviour can be reliably predicted.

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