

Ethical Thinking and Sustainability in Role-Play Participants: A Preliminary Study

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Abstract

Purpose. Can games provide a **holistic** understanding of the **ethical decision-making** process related to **sustainability** and environmental management?

Method. Thirty participants, 18 to 34 years old, were recruited. Twenty were then randomly assigned to play a popular role-playing game, which raises an issue of whether to **drain** or **preserve a virtual lake**. Ten participants were assigned to a control condition, which involved a written version of the lake dilemma. Using a researcher-developed coding scheme, this study **compared** the **ethical thinking** skills and thought processes used to approach the **lake scenario**.

Findings. **Control** condition participants more frequently chose to **drain** the lake than **game** condition participants. The top-ranked thought processes used by the control condition participants were **reasoning**-related only, whereas the top-ranked thought processes used by the **game** condition participants were both **reasoning**- and **empathy**-related, which may have related to their greater likelihood to preserve the lake. While, most game participants chose to preserve the lake (75%), game participants chose the “negative” choice in this scenario more often than any other (non-sustainability related) scenario provided in the game.

Implications. This study helps us to understand how people think through sustainability-related scenarios, and how to use games for policy making and education.

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How can we use Commercial Off-the-Shelf (COTS) games to better understand the complexities of the ethical thinking and decision-making processes regarding sustainability and environmental issues? Briefly, sustainability is defined as the maintenance, balance, and preservation of the finite resources on Earth so as to protect it for the future (Kola-Olusanya, 2008, 2012). The implication of such a view is that if a balance is not achieved, the activities and well-being of humankind may not be sustainable in the future. Further human consumption would have to be curtailed if all available resources are drained.

Another implication of this definition is that achieving a balance is the “moral and ethical responsibility of the present generation” (Kola-Olusanya, 2008, p. 70)—maintaining the environment’s resources and continuing (or enhancing) the quality of life of humankind is the duty of current citizens (Kola-Olusanya, 2008, 2012). Every citizen needs to practice sustainability effectively and ethically. Understanding how people ethically think through decisions related to sustainability is imperative to, for example, creating more effective policies or designing educational interventions that can encourage sustainable attitudes, activities, and behaviors.

In this article, I investigate how participants think through the decision to preserve or mine a lake in FABLE III, a role-playing game (RPG), and I compare this to how control condition participants think through a written version of the same scenario. Throughout this article, I use the expression *ethical thinking* to refer to the process of thinking through an ethical decision or scenario, including the skills and thought processes used.

I first review the literature related to ethics, sustainability, and games. Next, I describe the methodology for this investigation, which involved a game condition, with participants randomly assigned to play FABLE III, and a control condition. I explore two hypotheses:

Hypothesis 1 (H1): Those participants who play a game version of the MINE THE LAKE scenario will more frequently choose to preserve the lake than those in the control condition.

Hypothesis 2 (H2): Game participants will more frequently use empathy-related skills and thought processes than those in the control condition.

Finally, I explore the implications of these findings, which include whether games can help model, predict, and evaluate emergent human behavior; and whether games can disrupt human responses to sustainability and be useful in educational interventions.

Background

Defining Ethics and Ethical Thinking

In this article, I refer to *ethics* in terms of the collective customs and principles (the “universal truths, or public rules or principles—norms and customs of one’s community,” Tierney, 1994, p. ix), as well as one’s personal or individual ethics. This definition does not indicate whether a practice is right or wrong—whether it is *ethical*—but rather conceives of ethics as a process or type of literacy. Thus, in this article, instead of *ethics*, I use the term *ethical thinking*, which describes the skills and thought processes individuals employ to make decisions in a given ethical choice, scenario, or challenge. Ethical thinking, therefore, is regarded as a thought process and set of behaviors that can be learned; it involves making decisions about, reflecting on, and considering the consequences of any ethical conundrums (Schrier, 2012). In this study, I am specifically investigating the ethical thinking (e.g., skills and thought processes) practiced by the participants in relation to one sustainability-focused scenario, whether to mine or preserve an imaginary lake.

Defining Sustainability

Definitions of sustainability are often debated (Iyer-Raniga & Treloar, 2000). The most cited definition comes from the United Nations World Commission on Environment and Development (WCED; 1987) and its Brundtland Commission Report, which explains, “sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (p. 43). On one hand, Iyer-Raniga and Treloar (2000) criticize this definition because of its vague, ambiguous nature, particularly given the lack of time context provided, “unless one was to consider a time frame of thousands of years” (p. 1). On the other hand, Kola-Olusanya (2008) explains that the Brundtland Commission Report definition has humanistic and ethical implications, as it is focused on optimizing human quality of life both in the present time and in the future.

Grant (2010) expands on the definition given in the Brundtland Report and focuses on the behavioral and economic aspects of sustainability, explaining,

Sustainability refers to our ability to engage in behaviors that both adequately reinforce the behavior of the current population and are repeatable over long time spans without having harmful effects on future generations. (p. 1)

Thus, sustainability relates to the practice of achieving a steady-state economy, where the population, consumption rate, and demands of the population are kept in balance with the availability of natural resources (Grant, 2010). Sustainable practice involves the processes and behaviors by which we can maintain the homeostasis of resources in a given context (Grant, 2010), with *resources* referring to any communally shared environmental resource that is finite and in limited supply (Grant, 2010), even if it is

renewing at some rate, such as water, oil, or other minerals, or fish or other food, as well as social resources, “such as the labor supply and infrastructure” (Betts, 2009). In a sustainable steady-state economy, inputs, such as minerals, and outputs, such as waste, are kept in check (Grant, 2010). If these are not kept in check, depletion will occur (Betts, 2009). Importantly, this suggests that sustainability is not about keeping resources as they are, but “maintaining a balance between use and renewal” (Betts, 2009).

Ethics, Environment, and Sustainability

This article approaches the human dimension of the complex problem of sustainability by considering both psychological and behavioral perspectives (e.g., Grant, 2010; Kola-Olusanya, 2008, 2012) and ethical perspectives (e.g., Betts, 2009; Marden & Mercer, 2005; Newton, 2002; O’Hara, 1998; Shearman, 1990). Sustainability and ethics have an almost intuitive relationship (Betts, 2009). O’Hara posits that sustainability is an ethical issue because it relates not only to how human beings affect each other, but also to how humans affect non-humans. In other words, harm to the environment can cause damage and be unethical even if no individual human being is ever directly impacted (O’Hara, 1998).

Sustainability is both a collective and individual ethical issue; it is considered one of the responsibilities of an informed, engaged global citizenry (Kola-Olusanya, 2008). For example, an individual’s ethical thinking around daily choices interacts with and influences the collective choices, and vice versa (Betts, 2009). In other words, how a community acts collectively—what practices it values or demonizes, what norms and behaviors it reinforces—affects and is affected by how its individuals think ethically through questions, choices, and challenges (Marden & Mercer, 2005). Consideration of sustainability requires the practice of reflection, critical thinking, and decision-making skills (Kola-Olusanya, 2008, 2012), all skills necessary for thinking through ethical issues in general (Schrier & Kinzer, 2009). Thus, sustainability can function as both an ethical issue and as a set of practices that involve ethical thinking skills and thought processes.

The Intersection of Games, Ethics, and the Environment

Despite the growing number of gamers (NPD Group, 2013), we are only beginning to understand how people practice ethical thinking in games, particularly in relation to issues of sustainability. Research has suggested that game participants do practice ethical thinking (e.g., Schrier, 2012; Sicart, 2009), ethical reflection (e.g., Zagal, 2011), and ethical reasoning in games (e.g., Simkins & Steinkeuhler, 2008). Empirical research related to the nature of ethical thinking in games is currently inadequate. However, a theoretical basis may exist for the use of games as practice fields for ethical thinking, as a game can simulate authentic choices and consequences, help participants experiment with alternative perspectives and systems of ethical beliefs, and

allow players to take on new personas and identities, all factors associated with the practice of ethical thinking (Schrier, 2010; Schrier & Kinzer, 2009).

Games may also be specifically suitable for practicing ethical thinking around sustainability. Games are complex systems with which to experiment, test, and play with various choices, conditions, and outcomes. Players can adjust variables, such as attitudes, behaviors, and resources, and reflect on any effects that emerge in a game's dynamic system. One of the primary challenges in teaching sustainable practices is that the consequences of harmful behaviors are delayed or nonexistent in the current generation, and may not show up until well into the future (Grant, 2010). Grant (2010) explains,

Sustainability is difficult in part because the consequences at issue are delayed and currently inapparent [*sic*]. Harmful effects such as climate change, overpopulation, shortages of fossil fuels and fresh water, are all delayed consequences that are less effective than they would be if they were current. (p. 10)

Therefore, simulating the effects of harmful behaviors and practices in a game may be effective because time can be compressed or fast forwarded, such that the longer term consequences can be experienced within a shorter term time period. Differential behaviors and conditions could be iteratively refined and revised to help players predict and experience the effects and consequences within a game's dynamic system.

This suggests that games may be valuable both to model behavior around sustainability, and to enable participants to view the consequences of their actions and to experience, in a simulated context, the harmful circumstances when shortages in a natural resource occur.

A number of games that simulate or motivate sustainable practices and environmental conservation have been developed and researched in recent years. For example, THE FIERCE PLANET GAME (www.fierce-planet.com) was created to explore the principles of sustainability, from within a classroom or informal learning context (Magee, 2012). Katsaliaki and Mustafee (2012) survey dozens of recent games (from 1990 to 2011) that specifically aim to teach sustainable development, including WORLD WITHOUT OIL (2008), GREEN CITY (2009), and ENERCITIES (2010). They find a potential use of these games in sustainable development education, and further recommend the use of a full sensory experience, 3D graphics, and social interaction in game play (Katsaliaki & Mustafee, 2012). Such elements are typically associated with COTS games, which may not be specifically designed for educational purposes, but may be effective if adapted for educational use.

COTS games, such as SIM CITY, have been cited in their potential for teaching and modifying behavior around sustainability (e.g., Tragazikis & Meimaris, 2009). However, researchers have only recently begun to explore COTS games as practice fields for sustainable behavior, and they have not empirically reviewed how a specific game, such as FABLE III, can help us understand ethical thinking around sustainability issues. Therefore, this research fills an important gap in the literature by systematically discovering, classifying, and analyzing the ethical thinking skills and thought

processes employed when participants make a decision related to sustainability in a game.

By doing this, we can uncover how participants think through sustainability issues and identify any differences in how participants practice ethical thinking around sustainability in a game versus in a written scenario, as well as which factors may relate to any differences. An implication of this research is to elucidate the complexity of emergent human behavior around sustainability, and also highlight elements that may affect participants' decision-making process around sustainability, so as to better design educational interventions and policies around sustainability.

Method

Based on previous research, I tested two hypotheses. The **first** hypothesis is that those participants who play the game condition (the game version of the sustainability scenario) will more frequently choose to preserve the lake than those in the control condition (the written version of the scenario; H1). The **second** hypothesis is that participants in the game condition will more frequently use empathy-related skills and thought processes than those in the control condition (H2). Any specific skills and thought processes employed by the participants, as well as the elements that affected the participants' decision-making process and ultimate choice, will emerge from the analyses of the data.

To investigate the two hypotheses, a multiple case study with mixed methodologies was performed. The COTS role-play game chosen was FABLE III (2010). More detail is provided about the choice of game later in the article.

Participants

Thirty male participants were recruited and completed the study. All of the participants were male to minimize any potential differences among subjects, particularly due to the small sample size ($n = 30$). In addition, the participants were 18 to 34 years old, have access to an Xbox 360 (all participants needed to play FABLE III on an Xbox 360, as it was only available on this console at the time of the study), play games regularly (defined as at least 1 hour each week), and had never previously played FABLE III.

Conditions

The 30 participants were randomly assigned to one of two groups: the control condition ($n = 10$) or the game condition ($n = 20$). In the game condition, the 20 participants played FABLE III over the course of about a month, for at least 9 hours total. Participants also filled out five journal entries while they played the game, in which they described any ethical decisions made (such as ones that were related to any quests, or more directly invited as part of the game play). In each journal entry, the participants needed to detail how and why they made their decisions.

The 10 control condition participants did not play FABLE III. Instead, they filled out five journal entries on the ethical decisions they made while reading through five written scenarios that were based on the FABLE III game. Just as in the game condition, control condition participants described how and why they made their decisions.

The purpose of including the control comparison was to reveal any differences in how ethical thinking was practiced in a game scenario versus a written version, and to highlight how any elements, such as game mechanics, player-avatar relationship, relationships with game characters or NPCs, and so on, may have related to any differences.

Research Protocol

Prior to random assignment to the two conditions (game or control condition), all participants were asked to take a survey, deployed via email, which included demographic and attitudinal questions. This survey also presented five written ethical scenarios based on scenarios found in FABLE III, but altered to reflect a contemporary and realistic context, rather than the imaginary context of FABLE III. For example, instead of choosing whether to mine a lake that exists in a fantastical world, participants were asked to pretend to be gem miners and decide whether to mine a lake for a gem for their employer and risk harming an organism living in the lake.

All 20 game condition participants played FABLE III until they reached Day 252 in the game, at which time the researcher met with them in-person and observed them playing the remainder of the game. During this in-person observation, participants performed a talk-aloud, or explained out loud any decisions as they were making them in the game. In other words, while playing FABLE III in the presence of the researcher, each participant expressed verbally any thoughts, feelings, concerns, or rationales when making decisions, actions, choices, and behaviors in the game. Once the in-person observation was completed, the researcher conducted a semi-structured interview (McMillan & Schumacher, 2001) with each participant.

The sustainability-related scenario addressed in this article was part of the game that was observed in-person by the researcher.

The control condition did not play FABLE III, and instead completed journal entries based on written scenarios, as explained above. Once the control condition participants completed and submitted their journal entries, they participated in a semi-structured interview with the researcher.

Debriefing

All participants recruited for the study were told prior to participating that the study relates to ethics and games, but were not given more details. Once they were accepted for participation, all participants were given more detailed instructions in terms of either playing FABLE III, or, if they were in the control condition, to read written scenarios. Following the semi-structured interview conducted with all participants, all

participants were debriefed on the full details of the study. I explained that FABLE III was used in the study and that the goal of the study is to better understand how people think through ethical decisions in games. The researcher also invited and answered any questions. During the debriefing, anecdotally, a majority of participants expressed that they enjoyed the study, and 80% of the participants liked playing the game (FABLE III). A number of the experimental condition participants (60%) expressed that reflecting on their ethical decisions and their game play, as part of the study and debriefing, enhanced their overall learning about themselves and their decision-making process. This relates to the discussions by Crookall (2010) and others about the importance of debriefing in reinforcing learning.

Coding Scheme

All utterances, including those from the in-game observation (“talk-aloud”), interview, survey responses, and journal entries, were coded using an interviewer-developed scheme. The researcher developed this scheme by first analyzing 10% of the 150 total journal entries, 30 interview transcripts, and 150 responses to the written scenarios on the survey instrument. From this, the researcher identified, classified, and compared all the discrete skills and thought processes employed by the 30 total participants. Please note that *discrete* refers to how the skills and thought processes were coded—as separate coded units—and not to how the participant used or meant to use them. Skills are defined as any action or behavior performed in relation to, or applied to, making a decision (e.g., prioritizing goals or referring to a previous experience). A thought process was any act of cognition in relation to, or applied to, making a decision (e.g., prioritization of relationships or prioritization of financial resources).

To generate the skill and thought process codes, the 10% of data and transcripts were first analyzed using in vivo coding, which entails coding the individual words that the participants use to describe their decision-making process. Next, those same data and transcripts were analyzed using thematic coding, which involves applying labels to every passage of the transcripts with the general themes that emerge. As a final step, all of the individual words and themes were consolidated for repetition, and those related uniquely to FABLE III’s game play were removed from the list. The skills and thought processes that remained are what is described as *ethical thinking* skills and thought processes in this study. For the purposes of this particular analysis, a total of 35 discrete skills and 20 discrete thought processes emerged. Thus, the ethical thinking skills and thought processes that were included in the coding scheme were derived from the bottom up rather than from the top down.

This coding scheme was iteratively tested until an interrater agreement of at least 85% was reached, which was achieved after the first round of testing. Once the coding scheme was finalized, all of the transcripts were fully coded.

Next, after identifying the skills and thought processes, the researcher grouped and classified them into the following four categories: reasoning-related, empathy-related, reflection-related, and information gathering-related. For example, skills such as *interpretation of information* and *prioritizing goals* were marked as reasoning-related

skills, as they involved interpreting and analyzing data, evidence, and other information to help make a decision. Or, skills such as *consider other's opinions* and *consider another character's emotions* were categorized as empathy-related skills, as they involved seeing the world through another's eyes and considering their perceived perspectives.

Summary of Game and Scenario Used

Rationale of choice of FABLE III. FABLE III was used in this study for a number of reasons. One, the game contains an ethical question related to sustainability that has a binary choice with varying consequences. Two, FABLE III has a primarily linear narrative structure, which enables easier comparisons across participants, as participants must address the same sustainability scenario as part of their game play. Finally, the FABLE game series is easily commercially available in mainstream outlets (e.g., Target, Wal-Mart, Amazon.com), extremely popular (e.g., Alderman, 2010; Burg, 2008), and RPGs in general are very popular among the 18- to 34-year-old demographic, making up approximately 10% to 30% of the top videogames sold the year FABLE III was released (Matthews, 2010).

Synopsis of FABLE III. FABLE III is a COTS RPG developed by Lionhead Studios and released in October 2011, originally for the Xbox 360. The setting of FABLE III is the imaginary world of Albion, which has a European, late 1800s fantasy setting, similar to its prequels (FABLE, 2004 and FABLE II, 2008).

The FABLE series, similar to other RPGs, is story-driven and requires the participant to play through the game using an avatar, or main character, which represents the player in the game. As the game progresses, participants can shape their avatar's character (their role). For example, participants can affect their avatar's standing in the game through the ethical choices they make, by completing quests and missions, or in how they treat other characters in the game (such as non-playing characters or NPCs, which are virtual, computer-controlled characters that are not controlled by an actual human). As participants play the game, and use different weapons or spells, they can also level up and gain new skills (e.g., more advanced magic-casting abilities).

In FABLE III, the player begins the game as the princess or prince Albion by selecting either the male or female avatar in the beginning of the game. The first half of FABLE III involves going on missions around Albion (such as searching for a special diamond), as well as building relationships with the NPCs. The meta-goal in the first half of the game is to overthrow King Logan, who is acting cruelly and killing innocent NPC villagers.

Once the player overthrows King Logan, the player becomes the new Queen or King of Albion. In this half of the game, players need to make a series of decisions, over the course of a year in game time, on how to rule Albion. The player is asked to make decisions, such as raising or lowering taxes or preserving a lake. These decisions are important because the player also needs to raise \$6.5 million by the end of the year, or \$1 for each citizen in Albion, to protect them from a coming threat. Each decision

relates to a specific cost or gain. So-called *positive* choices decrease money from the treasury, while so-called *negative* choices increase money. The only way to gain \$6.5 million is to make all negative decisions, or make money in monotonous mini-games or real estate purchases. Players can also use cheats, such as leaving their game running to earn money on long-term investments, or changing the clock on their console.

While playing FABLE III, the player builds his avatar's moral standing based on his or her behavior during quests, interactions with any NPCs, and the choices he or she makes. Depending on these choices, the avatar's moral standing evolves, the appearance changes, how NPCs treat the avatar changes, and the virtual world of Albion changes. For example, players, via their avatar, can kill an evil NPC, which would enhance their moral standing. They can also accidentally kill an innocent townspeople NPC, which would decrease their moral standing. In the former, other NPCs may treat the avatar with reverence, in the latter, fear. At the end of the game, the player finds out how many citizens they protected, based on the amount of money in their treasury. They also are deemed a benevolent or malevolent leader; if morality is high, the avatar will grow angel-like wings and a halo; if morality is low, the avatar will grow horns and sport a red glow.

Thus, players need to weigh competing interests and desires, and balance their moral standing in the game with their ability to have enough money to protect their citizens. For the purposes of this article, I focus only on the one ethical decision experienced in FABLE III that directly relates to sustainability, which is the *Mine the Lake* scenario.

Mine the Lake. The Mine the Lake scenario occurs once the player has already become the King or Queen of Albion, and is asked to make decisions about the fate of Albion and its citizens. The participant addresses this Mine the Lake scenario right at the beginning of the in-person game observation, which occurs just after Day 252. In the scenario, the player is asked to decide whether to preserve a Bowerstone Lake, for future generations (which subtracts \$50,000 from the treasury, and not being able to protect 50,000 citizens), or to mine the lake (which gains \$400,000 for the treasury, and being able to protect 400,000 citizens). To help think through this scenario, the player can listen to two perspectives within the game: one by Page, an NPC, who is pro-preservation, and another by Reaver, an NPC, who is pro-mining. Throughout the game, thus far, the player has developed a close friendship with Page, whereas the player has a more adversarial relationship with Reaver. Moreover, the participant must answer the question in front of an audience of NPC villagers.

The control condition version of this scenario describes the game scenario in writing. The survey version updates the game scenario to a contemporary context, and asks the participants to decide whether they would mine a lake for a rare gem, with the danger that they may harm an organism living in the lake; while under pressure to find these gems for their employer or face losing their job.

To summarize, three different versions of the Mine the Lake scenario were compared: the game, control, and survey versions.

Results

The data were collected and analyzed. To test the two hypotheses, the following were identified:

1. The types of ethical thinking skills and thought processes players used to make decisions in the Mine the Lake scenario in FABLE III and in the control (non-game) condition, including any differences among conditions.
2. The choices selected in the Mine the Lake scenario, across each of the three versions of the scenario.

As described in the “Method” section, a total of 35 discrete skills and 20 discrete thought processes emerged during this study, which were then classified into four categories: reasoning-related, empathy-related, information gathering-related, and reflection-related. For this article, I focused only on reporting and analyzing results related to reasoning- and empathy-related skills and thought processes.

To evaluate the ethical thinking skills and thought processes performed in the Mine the Lake scenarios, statistical analysis was conducted. Frequency counts were derived, and Fisher’s Exact Test was performed to reveal any significant differences among analogous survey, game and control versions of the scenarios, on any decision made, or ethical thinking skill or thought process that emerged. Fisher’s Exact Test was used, rather than a chi-square test, because of the small sample size in the study. Game elements or factors that related to these decisions, skills, and thought processes employed were also considered, though not statistically tested.

Although differences were found to be statistically significant, they should be considered as trends and further studied, due to the limited sample size of this research ($n = 30$).

Survey Condition Results

In the survey version of the Mine the Lake scenario, participants stated multiple decisions about what they would do, such as *protect the lake* (13/30), *find a way to buy the lake* (19/30), *find more gems* (12/30), and *sell the gem* (19/30). Some participants chose more than one decision because the survey scenario was open-ended, unlike the more constrained choices in the game and control versions. Thus, the choices cannot be statistically compared with the choices made in the game or control conditions in a rigorous manner.

The highest frequency skills used in the survey version of the Mine the Lake scenario were primarily reasoning-related skills, such as *using evidence as support* (see Table 1). Using Fisher’s Exact Test, significant differences were found between the use of at least one empathy skill (4/30) and the use of at least one reasoning skill in this scenario (28/30), $p < .0001$.

The highest frequency thought processes used in the survey version of the Mine the Lake scenario were primarily reasoning-related, such as *prioritizing individual or*

Table 1. Highest Frequency Skills Used in the Survey.

Skill	Frequency	Category
Providing reasons	28/30	Reasoning-related
Using evidence as support	27/30	Reasoning-related
Consideration of future outcomes	27/30	Reasoning-related
Analysis of context	27/30	Reasoning-related
Interpretation of information	26/30	Reasoning-related

Table 2. Highest Frequency Thought Processes (Priorities Only) Used in the Survey.

Thought process	Frequency	Category
Prioritizing self-interests	18/30	Reasoning-related
Prioritizing financial interests	12/30	Reasoning-related
Prioritizing personal ethics	7/30	Reasoning-related
Prioritizing preservation	7/30	Reasoning-related

self-interests (see Table 2). The most frequently cited priorities were self-interest as well as financial interest. Less frequently cited were one's personal ethics or a desire for preservation. In other words, participants more frequently focused on making sure that they kept their job or found more gems in the lake (18/30), rather seeking to preserve the lake or the lake's organism, or *do the right thing* (7/30). The frequency of self-interested or financial-related thought processes over preservation-focused or personal ethics-focused thought processes was significantly different ($p = .0082$), using Fisher's Exact Test.

Control Condition Results

In the control condition of the Mine the Lake scenario, 7 out of 10 participants chose to mine the lake, as opposed to 3 out of 10 participants who chose to preserve the lake. No significant differences were found between these two decisions.

The highest frequency skills used in the written version of the Mine the Lake scenario were primarily reasoning-related skills, such as *interpretation of information* (see Table 3). Using Fisher's Exact Test, significant differences were found between the use of at least one empathy-related skill (4/10) and the use of at least one reasoning-related skill (10/10), $p = .0108$.

The highest frequency thought processes used in the written version of the Mine the Lake scenario were primarily reasoning-related, such as *prioritizing financial gain* (see Table 4). In other words, participants considered, above all, how much money mining the lake would add to their treasury. This money could then be used to save the lives of the citizens of Albion.

Table 3. Highest Frequency Skills Used in the Control Condition.

Skill	Frequency	Category
Interpretation of information	10/10	Reasoning-related
Using evidence as support	10/10	Reasoning-related
Consideration of future outcomes	10/10	Reasoning-related
Analysis of context	10/10	Reasoning-related
Providing reasons	10/10	Reasoning-related
Weigh options	10/10	Reasoning-related

Table 4. Highest Frequency Thought Processes (Priorities Only) Used in the Control Condition.

Thought process	Frequency	Category
Prioritizing financial interests	6/10	Reasoning-related
Prioritizing safety	5/10	Reasoning-related
Prioritizing personal ethics	4/10	Reasoning-related
Prioritizing people over the environment	4/10	Reasoning-related

The participant’s journal entries provided further insight into the ethical thinking process. For example, one participant explains,

I would construct the [mine]. It would ruin the one escape to nature in our land but we are at war and we need to survive, sacrifices must be made, we can construct a man-made lake elsewhere . . . I cannot risk not reaching the \$6.5 mark and losing the war. We can make profit off this by draining it, building the quarry and making a man-made lake elsewhere. I realize it won’t be the same as the one nature had provided for us, but I do what I must to survive this war and I can live with a lesser lake, as should the people. (ID #6432221, Journal Entry 5)

In other words, this participant weighed the desire to protect the citizens during a coming war with the benefits of a natural lake, and decided that a man-made lake could be created later, but people’s lives needed to be saved in the near-term.

Almost half of the control condition participants specifically cited, unprompted, that it was more important to protect people’s lives rather than protect the environment—they weighed human needs above environmental needs. For example, one participant wrote,

the people of Albion are preparing for war: the least of their concerns is having a place to “get away from it all,” given the fact that there’s an army of evil forces coming to take their lives. At some later date, the lake can be plugged up again, and, either through irrigation or heavy rains, refilled. However, . . . \$400,000 will help the Treasury in

Table 5. Highest Frequency Skills Used in the Game Condition.

Skill	Frequency	Category
Interpretation of information	20/20	Reasoning-related
Using evidence as support	20/20	Reasoning-related
Providing reasons	19/20	Reasoning-related
Prioritizing goals or factors	19/20	Reasoning-related
Analysis of context	18/20	Reasoning-related
Weigh options	18/20	Reasoning-related

addition to the added wealth earned from creating the quarry and the jobs associated. (ID #10, Journal Entry 5)

Only three participants in the control condition prioritized the longer term effect on the environment. For example, one participant's remarks reflect a desire for sustainable practice and a steady state of resources. He explains,

I figure that Bower Lake is irreplaceable and is a constant source of food, revenue, and whatever else. If I drain it, it's gone forever. If 350,000 people die, they can be replaced. The relatively small gain (compared to the numbers involved in the other scenarios) for draining the lake helped influence me not to drain it . . . As a more humanistic note, the existence of the lake might save more than 350,000 lives over time after the war is over. (ID #14, Journal Entry 5)

Thus, this participant decided that the environment was the priority and more vulnerable. The preservation of the lake could even lead to saving more lives over the long-term than saving money for the war in the near-term.

Game Condition Results

In the game version of the Mine the Lake scenario, 5 out of 20 participants chose to mine the lake, as opposed to 15 out of 20 who chose to preserve the lake. A significant difference was found between these two decisions ($p = .0038$), using Fisher's Exact Test.

The highest frequency skills used in the game version were primarily reasoning-related skills, such as *providing reasons* (see Table 5). Using Fisher's Exact Test, significant differences were found between the use of at least one empathy skill (13/20) and the use of at least one reasoning skill (20/20), $p = .0083$.

The highest frequency thought process used in the game version of Mine the Lake scenario was *prioritizing financial gain when making a decision*, which is reasoning-related, and the second-most frequently used thought process was *prioritizing other's perspectives when making a decision*, which is an empathy-related thought process (see Table 6).

Table 6. Highest Frequency Thought Processes (Priorities Only) Used in the Game Condition.

Thought process	Frequency	Category
Prioritizing financial interests	8/20	Reasoning-related
Prioritizing other people's perspectives	7/20	Empathy-related

Table 7. Statistically Significant Differences in Skills Used in the Survey Versus Control Condition.

Skill	Significance	Survey	Written
Consideration of self-interest	$p = .0031$	7/10	0/10
Consideration of long-term effects	$p = .0325$	0/10	5/10

These results suggest that in the game condition, attitudes, behaviors, and thought processes toward the environment were more frequently affected by and considered with regard to the perspectives of non-playing characters (NPCs) in the game, in addition to financial interests (which equate to protecting citizens).

The participant talk-aloud helped provide further insight into the ethical thinking process used in this scenario. Four of the 20 game participants based their decision about the lake in part on whether they disliked or liked the character (NPC) giving them advice. For example, one participant liked the NPC, Page, who provided arguments for preserving the lake. He explains,

[Page] said something about this being the last . . . natural resource, and because it's the last natural resource, I don't have a choice. I don't have a choice, you know. It's not like I have to keep a promise here, but at the same time, I don't have a choice. (ID #14922, Interview, February 2011)

A few participants mentioned during their talk-aloud that making the decision in front of an audience, even though the audience consisted of NPCs and not real people, influenced their decision-making process, and made it more difficult for them to make the so-called negative decision.

Comparisons Among Conditions

Control versus survey. In comparing how participants worked through the scenario in the control version of Mine the Lake versus the survey version, we found a few significant differences. Using Fisher's Exact Test, significant differences were found on two reasoning-related skills: *consideration of self-interest*, which was higher in the survey version, and *consider long-term effects*, which was higher in the control version (see Table 7).

Table 8. Statistically Significant Differences in Thought Processes Used in the Survey Versus Control Condition.

Skill	Significance	Survey	Written
Prioritizing self-interest	$p = .0031$	7/10	0/10
Prioritize people's safety	$p = .0325$	0/10	5/10

Table 9. Statistically Significant Difference in Skills Used in the Control Versus Game Condition.

Skill	Significance	Control	Game
Assessment of another's character	$p = .0110$	0/10	10/20

Table 10. Directional Difference in Thought Processes Used in the Control Versus Game Condition.

Skill	Significance	Control	Game
Prioritizing people's safety	$p = .0778$	5/10	3/20

Using Fisher's Exact Test, significant differences were found on two thought processes: *prioritization of safety and people's lives over all other factors*, which was higher in the control version, and *prioritizing individual or self-interests*, which was higher in the survey version (see Table 8).

Control versus game. In comparing how the participants worked through the control or game version of the Mine the Lake scenario, we found significant differences on one reasoning-related skill (*assessment of another character's personhood*; see Table 9) and no significant differences on the thought processes used, except for a directional difference on *prioritization of safety and people's lives over all other factors* (see Table 10). We found no significant differences between the use of at least one empathy-related skill in the control versus game conditions.

We found a significant difference between the decisions made in the analogous Mine the Lake scenarios (control vs. game version). A significantly greater frequency of participants decided to preserve the lake in the game condition than in the control condition (see Table 11).

Game versus survey. In comparing the game version of Mine the Lake versus the survey version, we found a significant difference was found between the use of at least one empathy thinking skill in the survey version (5/20) and the game version (13/20), $p = .0248$, using Fisher's Exact Test. Using Fisher's Exact Test, we found significant differences on two reasoning-related skills, including *consideration of self-interest* and *financial assessment/consideration of the expense or financial implications* (see Table 12).

Table 11. Decisions Made in the Control and Game Conditions.

Decision	Significance	Control	Game
Mine the lake		7/10	5/20
Preserve the lake	$p = .0038$	3/10	15/20

Table 12. Statistically Significant Differences in Skills Used in the Survey Versus Game Condition.

Skill	Significance	Survey	Game
Consideration of self-interest	$p = .0022$	12/20	2/20
Consideration of financial aspects	$p = .0079$	8/20	17/20
Taking on another's perspective	$p = .1274$ (directional)	2/20	7/20

Table 13. Statistically Significant Differences in Thought Processes Used in the Survey Versus Game Condition.

Thought process	Significance	Survey	Game
Prioritization of self-interest	$p = .0012$	11/20	1/20
Prioritization of other's perspectives	$p = .0083$	0/20	7/20

Using Fisher's Exact Test, significant differences were found on two thought processes, including "prioritizing individual or self-interests," and "prioritization of other's perspectives when making a decision" (see Table 13).

Hypothesis testing results. The data fully supported H1, as the game condition participants more frequently chose to preserve the lake than the control condition participants. Testing H2 is more complicated. No significant differences were found on the specific empathy-related skills and thought processes used between game and control condition participants. The control participants' top skills and thought processes used were all reasoning-related. For game participants, the most frequently used skills were reasoning-related, but a mix of reasoning-related and empathy-related thought processes was used, which may have been related to their higher frequency to preserve the lake. Thus, H2 was not fully supported by the findings. Anecdotally, game participants referred to their relationships with NPCs in the game, and expressed a desire to consider the perspective of *friend* NPCs, so this hypothesis should be studied further.

Discussion

The game condition participants used a variety of ethical skills and thought processes when considering the decision of whether to mine the lake in FABLE III. Moreover,

we found differences in the skills and thought processes used in the game, control, and analogous survey scenario.

In sum, participants in the control condition primarily used reasoning-related skills and thought processes, such as interpretation of evidence, weighing alternatives, and prioritizing financial gain over environmental preservation. The three people who did decide to save the lake in the control condition did so because they felt that in the long term, Bowerstone Lake was more important to the long-term livelihood of the world than people's lives in the short term.

On the other hand, participants in the game condition frequently used both reasoning-related and empathy-related thought processes. Although game participants cared about saving people's (NPC citizen's) lives, they also cared about the livelihood of the world of Albion. They listened and empathized with an NPC who had become their friend, and this may have influenced their decision to preserve the lake. They considered more deeply the long-term viability of Albion, rather than only any financial gains (which also correlate to people's short-term safety). These differences may have been related to differences in the actual choice selected, as participants in the control condition more frequently chose to drain the lake, whereas those in the game condition more frequently chose to preserve the lake.

The survey contains an analogous scenario, but no meta-story or greater context to the problem. The control condition contains a meta-story context based on the FABLE III backstory (including a description of the coming *evil threat* and the need for money to protect the citizens), but no game elements, such as NPCs, rules, goals, feedback, game mechanics, development of relationships with characters, and a visualization of the environment of Albion, which may potentially influence the participants' ethical thinking process. Further analysis would be needed to isolate which specific game element(s) affected any results. Figure 1 provides a summary comparing the survey, control, and game scenarios on (a) its use of a story context, (b) the category of most frequent skills and thought processes used, and (c) the highest priority thought process used.

Sustainable Practice May Be Affected by Empathy and Relationship Development

In the game, the player's avatar develops a strong platonic relationship with the NPC (Page), who argues for the preservation of the lake. The player also develops a broader relationship with the world of Albion and its NPC inhabitants. The development and experience of these relationships may have affected the choice made by the participants. Ethical thinking around sustainability in a game context may be influenced by other people's perspectives and behaviors, and one's relationship with others, and this should be studied further. The practice of empathy and empathy-related skills and thought processes could relate to greater focus on, and prioritization of, preservation, care and sustainable attitudes, thoughts, and behaviors toward the environment. This is tangentially supported by previous research, for example, Lurie (2004), who investigated ethical decisions made in a managerial context. Lurie found that managers who

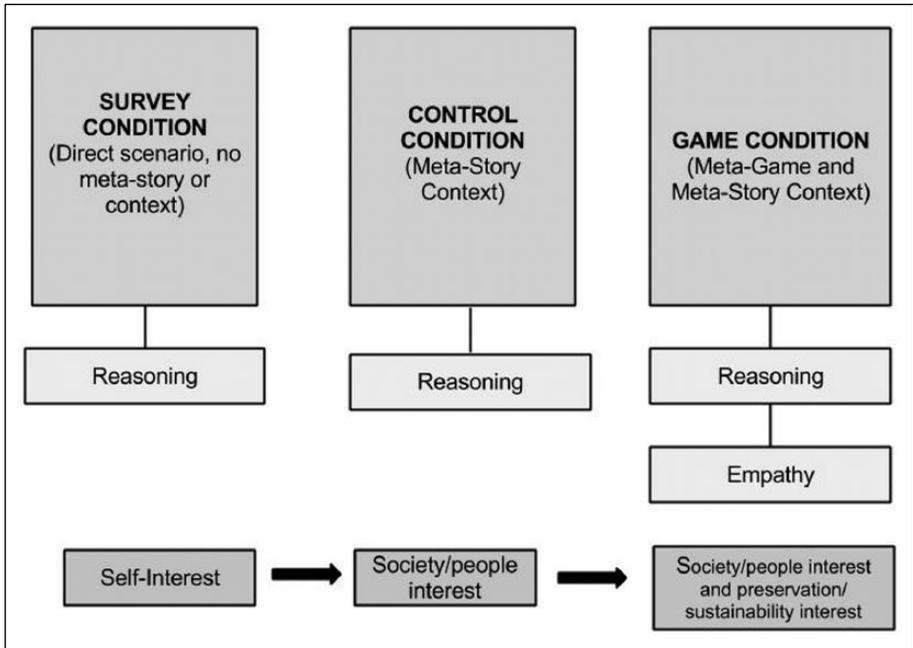


Figure 1. A schematic of the most frequently used skills and thought processes used, by condition.

use emotions effectively in their decision-making process make more nurturing decisions and further foster relationships among their colleagues. Likewise, games could support greater empathy practice because of the ability to form and experience relationships, learn alternative perspectives, and identify and assess others' emotions, which could then affect one's ethical thinking process.

The results also suggest that those modeling the complexity of human behavior with regard to sustainability should consider how people's perspectives affect each other. If we simulate questions of sustainability on paper, without considering the full interpersonal and social context, we will miss essential ways to motivate sustainable actions and thoughts. Those designing games to support sustainable practices should consider and evaluate how NPC's and other player's perspectives affect one's behavior, thoughts, and learning, and vice versa. How might even the presence of AI-driven NPCs, or knowledge that other people are watching, affect one's ethical thinking in a game, and how does this correspond to the real world?

Sustainability as the Lowest Ranked Priority

Just as we need a holistic context to more fully understand human behavior and ethical thinking around sustainability, we also need to consider how people make choices about sustainability in relation to other choices and priorities. All of the game

condition participants in this study ended up with a benevolent moral standing overall in FABLE III, suggesting that most of the decisions they made were the so-called positive or good ones. For example, most of the participants chose to *build an orphanage* rather than *build a brothel*. However, out of the nine specific decisions analyzed in FABLE III, the decision to Mine the Lake elicited the most frequent choice of the negative or bad choice, with 5 of the 20 participants, or 25% of the participants, deciding to drain the lake. Of the participants (10) who did not have enough money at this point in the game to cover any costs of a positive decision, 50% decided to capitulate and drain the lake, which was often the only so-called negative choice they made in the game. Ten participants had enough money in their treasury to protect all the Albion citizens (\$6.5 million), and 6 of these participants said that they would have considered mining the lake if they had not had enough money to cover the costs.

These findings suggest that the choice to Mine the Lake rather than preserve it was considered less egregious than the other possible bad choices in the game. None of the other scenarios in the game were sustainability-focused; rather, they were more concerned with economic or social policies that directly affected the citizens of Albion. Other scenarios in the game included deciding to renovate a shelter and orphanage or build a brothel, raising or lowering taxes, building an outpost to protect the citizens in a war, bailing out the economy or letting it collapse, and restoring child benefits or introducing child fines.

Thus, if we simply pose a question to participants, *would you mine a lake?* many may say they would not, but this would not fully capture the complexities of ethical thinking around sustainability. Instead, we need to pose the question alongside other conditions and variables, and from within a complex system, to better understand how people weigh and rank it in regard to other considerations, to truly simulate how people behave. In other words, we cannot consider sustainability in isolation; rather, we need to model ethical thinking around sustainability in the context of a broader system of authentic social, emotional, economic, logistical, financial, and physical constraints.

Finally, the results suggest that educational interventions should encourage people to consider longer term human and environmental consequences, as well as provide opportunities for people to prioritize consequences iteratively so as to predict and experience differing outcomes. Educational interventions should also help people reflect on what and why they prioritize given varied constraints and resources.

Conclusion

In this article, I investigated how participants think through a scenario in the game, FABLE III, and explored what this reveals about the process by which human beings ethically think through environmental and sustainability issues. Understanding this process can help us more realistically and holistically simulate and model human responses to environmental questions. This can also help us find better ways to educate the public about sustainability, make policy changes, and alter public sentiment, behaviors, and actions.

In the study, I compared participants in two conditions: a game condition and a control condition. All participants thought through whether to mine a lake or preserve it. The game participants approached the scenario within a game, FABLE III; the control participants worked through a written version of this scenario.

Participants in the game condition prioritized a mix of reasoning- and empathy-related thought processes, whereas control condition participants only prioritized reasoning-related thought processes. Game condition participants more frequently used empathy-related skills and thought processes in the game scenario than when approaching the survey version. The control condition participants more frequently chose to drain the lake, whereas participants in the game condition were significantly more likely to preserve it. This suggests that the game's context, including one's relationships with NPCs and the virtual world of the game, may have influenced one's ethical thinking process, leading to different outcomes. The connection between use of empathy-related skills and thought processes and how human beings ethically think through sustainability scenarios, as well as how these skills and thought processes are elicited through games and other experiences, should be further studied.

However, compared with other ethical decisions in the game, game condition participants were more likely to choose the so-called negative choice (*drain and mine the lake*) in this sustainability-focused scenario than in any of the other types of ethical scenarios in FABLE III. This suggests that when compared with other priorities, environmental concerns may be the first to be deprioritized. Understanding environmental decisions in context and within a complex system, and in relation to other short-term and long-term concerns and consequences, is essential. Games can help highlight sustainable practice in context, and alongside varying priorities, as well as illustrate for us the longer term consequences of one's ethical thinking and behaviors, particularly when any consequences cannot be realized or observed in one's lifetime.

Limits to the external validity of the study are a small sample size, the inclusion of only males who have an Xbox 360, and the use of FABLE III, a COTS game not specifically created for research, which does not represent all game experiences. Moreover, the specific sustainability question in FABLE III (to mine or preserve the lake) also does not represent all types of sustainability questions. An experimental design with a larger sample size, a broadening of the population included in the study, and incorporation of other games and sustainability scenarios, would be useful in better understanding how people practice sustainability in game and non-game contexts, and what factors are related to this practice. Although a larger sample size would have helped enhance our ability to detect any significant differences and overall confidence in those differences, a small sample size is not necessarily an issue (Abelson, 1997).

These findings suggest that COTS games, such as FABLE III, may be useful contexts for revealing and understanding collective and individual ethical thinking in relation to sustainability. It also suggests that games can motivate the practice of the skills and thought processes around issues of sustainability, implying that games could function as educational interventions for the development of sustainable practices.

Three next steps would be to

1. investigate which particular ethical skills and thought processes are related to enhanced practice of sustainability;
2. study which specific game design principles, elements, and factors are related to the practice of those particular skills and thought processes; and
3. find ways to address these principles so as to better motivate practice of sustainability inside and outside of a game experience.

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