

Player Choices in Games: How Agency Affects Retention

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Research Question

Does including player agency in the design of an educational game affect retention of educational content?

Introduction

Abstract

Classrooms across the country have started to use educational games to increase student performance (Wastiau, 2009). Understanding the specific game mechanics that lead to better learning outcomes is important for the future development of educational games. A game mechanic is "any part of the rule system of a game that covers one, and only one, possible kind of interaction that takes place during the game, be it general or specific" (Lundgren & Björk, 2003). This study examines the implementation of choice as a game mechanic to find the relationship between agency in games and content retention. Students at the University of Minnesota: Twin Cities were randomly assigned to one of two short educational computer games; one of which used choices to give the player agency. The Students filled out posttests immediately after playing, and one week later to test content retention. We hypothesize that students who have agency in their games will be able to retain more educational material after playing.

References

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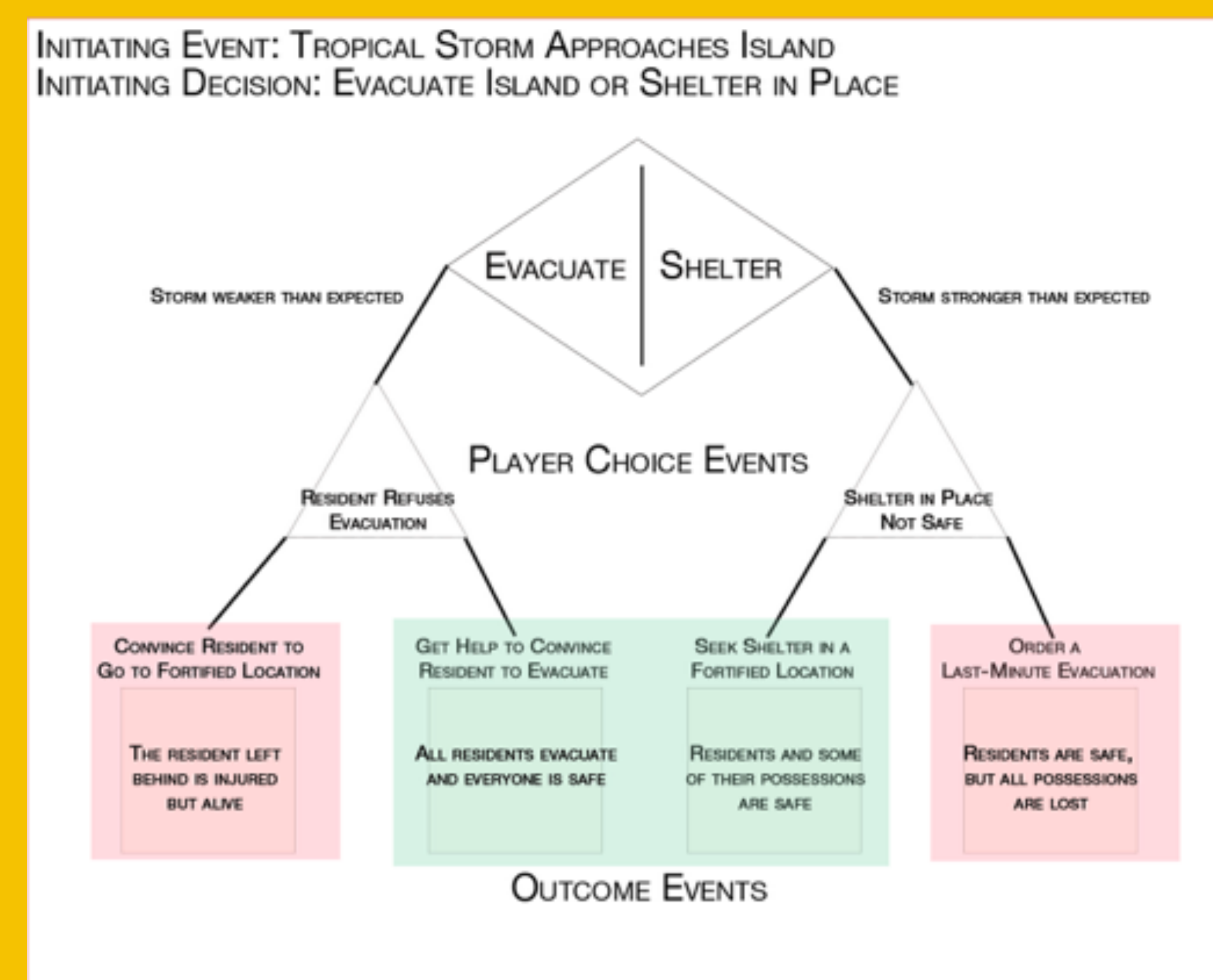
Methods

Design

The study used a between-subjects experimental RCT design with two conditions: A condition with agency (treatment) and a condition without agency (control). Participants are students at the University of Minnesota Twin Cities; 9 students participated in the study which took place over 3 months.

Gameplay

In both versions of the games, participants engage in data collection, conduct interviews, and report their findings. However, the sequence of narrative events is partially controlled by the player in the agency condition by allowing them to make choices, whereas the control condition has a set path the player takes through the events of the story that are not influenced by choices the player makes.



Measures

The Play Experience Scale

The Play Experience Scale (PES)⁵ was developed as a means of assessing play experiences in video games in four categories, this study will use one of the four categories, Freedom, to control for sense of agency in gameplay.

| The player's sense of being able to do what they want to do within the game space. | |
|--|-------------|
| If I wanted to do something in the game, I was able to do it | Freedom |
| I was able to make the game do what I wanted it to | Freedom |
| The game gave me the freedom to act how I wanted to | Freedom |
| The game made it difficult to perform the actions that I wanted to | Freedom (R) |

Memory Assessment

Participants were asked to read a few short sentences before playing the game. After one week participants were asked questions regarding the content of the sentences. This will control for individual differences in memory affecting retention results.

Content Assessment

A brief multiple choice content assessment was administered both directly after playing the game to assess what content was delivered and again one week later to help assess the retention of that content.

Preliminary Results and Discussion

Results from the preliminary data shows no significant differences between the post test and the delayed post test in either condition.

The post test scores from the agency condition (M=4.4, SD=0.55) and the delayed post test scores from the agency condition (M=4, SD=1.22) showed no significant difference; $t(5)=0.6667$, $p=0.7293$.

The post test scores from the non agency condition (M=4.25, SD=0.96) and the delayed post test scores from the agency condition (M=4, SD=0.82) showed no significant difference; $t(4)=0.5222$, $p=0.6812$.

This data is collected from the first third of expected participants. Even with the lack of a significant differences so far, a visual comparison of the means in the agency group appears to show no difference between post test and delayed post test. This is not true for the non agency group, which appears to have lower delayed post test scores compared to its post test scores.