

# Facilitating Group Decision Making in Selecting Board Games to Play

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## ABSTRACT

We propose “ReadySelectPlay”, a board game selection application intended to aid in the process of group communication of board game groups and to aid with filtering games within a large list of games that are available to be played during a board game night.

Being active board game players we observed the complexities and conflicts that can arise in the process of decision making while selecting games to be played during a board game night. There are applications where users can create groups for communication and there are websites where users can obtain information on board games as well as filter games based on certain criteria, but there is no application that presents these features in a way that assists in the process of selecting a game from among the games a group owns. Our application was created to address these issues by providing those features in a convenient fashion while assisting in the decision-making process.

To test the effectiveness of our application we simulated a board game party night and performed a qualitative analysis to observe how our application affected the process of communication and decision making. Based on the results of evaluating ReadySelectPlay, although there is room for improvement both within our design and our experimental evaluation, we believe this application has the potential to solve these issues.

## Author Keywords

Group Decision-Making, CSCW, face-to-face interaction, consensus building

## INTRODUCTION

Selecting a board game in a group can be a difficult endeavor. Multiple factors can complicate the process, such as keeping track of everybody's preferences, negotiating different wants and needs, and explaining games that people may be unfamiliar with. Having a good selection of games is fantastic, however, if the selection becomes too large then a large part of the evening can be spent in trying to choose

which game the group is going to wind up playing. Additionally, taking into account everyone's preferences can be difficult to do in a timely fashion and selecting from a huge list of games can take a long time as people have to stop and explain several games to other players not familiar with them. Within this process trying to negotiate clashing preferences can lead to conflict and indecision.

To address these issues, we created, “ReadySelectPlay”, a board game selection application that supports functionalities where users can create a game room, add the expected attendees and the attendees can add games to the room which they will be potentially bringing to the game night. To ease the process of filtering of games based on user's preferences, we provide a rich set of filters where games can be filtered on game mechanics, duration, category, player count and level of difficulty. Users can avoid the hassle of manual filtering by using the filter option and see how each filter affects their list of games. Finally, once the games are filtered, users can then vote for games of their choice and the game with the most votes will be selected.

## PREVIOUS WORK

Group Decision-Making (GDM) is a field of research that examines how groups of people come to decide on a solution to a problem, often focusing on the context of a work environment or through collectively solving logic or math problems. Our problem focuses on consensus building based on preference in the leisure activity of playing games. Despite this context not being the usual one of the study, we believe that research into GDM is still largely applicable.

Many research project focus on developing new technologies to improve the process, whether that be through creating stronger consensus or through balancing discussion so that disagreements or dissenting views can be highlighted and addressed. For example, Joan Morris DiMicco developed Second Messenger a

tool intended to balance conversation by increasing visibility of voices that speak less in a discussion [1]. Weichen Liu et al. Examined multi-criteria decision making by developing a project called ConsensUs and found that quantifying individual opinions and visually highlighting disagreements led to participants aligning their ratings more with other group members [2]. Roshanak Zilouchian Moghaddam et al. explored methods to promote consensus building with GDM technologies by creating Procid, a browser plugin designed around six strategies that included promoting a sense of empowerment in users and maintaining a positive nature in concerns among others [3]. What we found is that these technologies sought to augment usual channels of communication rather than supplant and replace them, so often these technologies served as secondary channels for organizing discussion points. This led to the decision for our application to focus on addressing only features we believed were lacking in unassisted decision making of groups deciding what board game to play.

Other research focused on specific group dynamics or approaches that weren't tied to a technology they were developing. These papers were useful in better understanding how groups in different contexts came to decisions and which of those contexts our problem fell into. Muesluem Atas et al. looked at cost/risk analysis but we found that types of decisions that revolved around risk or had problems presented with binary correct and incorrect answers were less applicable for our project [4].

Cong-Cong Li et al. researched consensus building and proposed a model for consensus, a model we found useful for identifying that our problem was consensus building of individual preference [5]. James A.R. Marshall et al. looked at collaboration in animals and gave us insight into a more general overview of the collaborative process [6]. Tatsuya Nakamura et al. found that time invested in solving didn't correlate to increased satisfaction with web search problems [7]. These findings informed our experimental design in that we discarded "time spent deciding" as a primary metric for

measuring the efficacy of our technology, although we still made sure to note how long it took to come to a decision. This is because research by Franco et al. examined how Need for Closure (NFC) can force individuals to come to a decision that does not take into account the whole model of the process [8]. We wanted to make sure we observed if NFC or other factors influenced decision making in our experiment.

While we were unable to find research on GDM with leisure activities, we hope that our experiment may offer some insight into approached towards using technologies to aid in Group Decision-Making for recreational tasks.

## **METHODS**

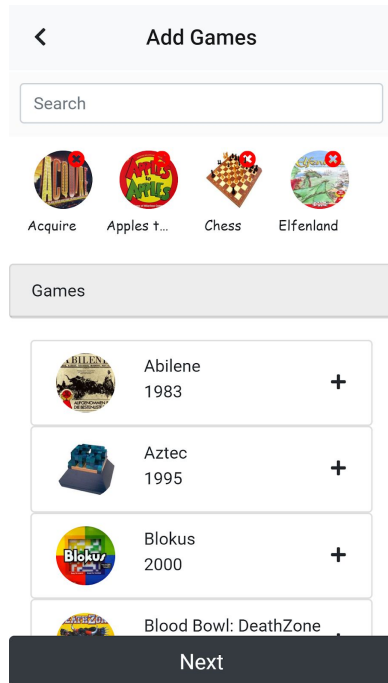
### **Software Prototype Design**

Based on our proposed solution, we created a paper prototype and after evaluating it, we developed our software prototype. We performed a heuristic evaluation and after identifying some shortcomings we modified our software prototype. We then performed a user evaluation. Our application's features can be divided into three main tasks.

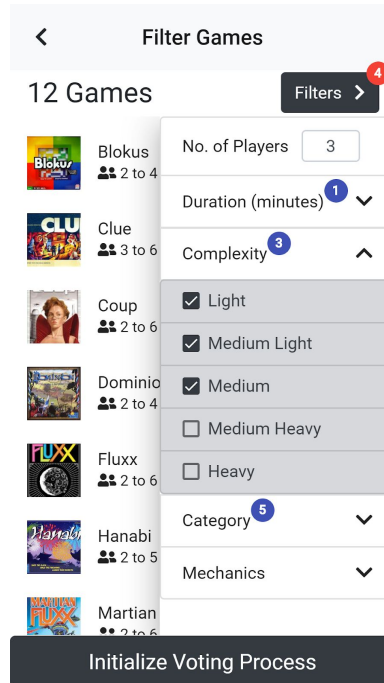
(i) Organizing the game night: This is done prior to the game night where the host creates a game room and adds the potential attendees of the game night and games they own. The attendees can also add the games which they will be bringing to the game night (see Figure 1).

(ii) Filtering games: This is done during the game night. Once all the games have been added, the list of games can be narrowed down by taking into account the different user preferences and applying them on the filter page which contains an extensive list of filters including duration, user count, complexity, categories, and mechanics (see Figure 2).

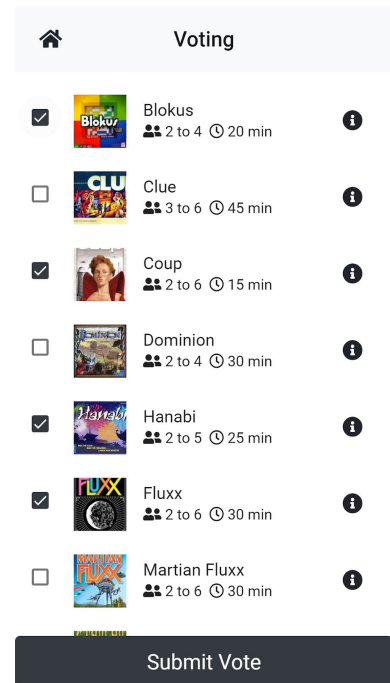
(iii) Voting: The final step is voting. Once the filtering is completed all users are presented with the filtered list of the games and the users can cast their votes for the games of their preference (see Figure 3). Once everyone has voted, the host ends the voting and the winning game is displayed where users can view information of the game which includes details such as a description, player count, category and the game mechanics.



**Figure 1: Party host can select board games for the game night**



**Figure 2: Party host can apply filter(s) for each preference**



**Figure 3: Party members can vote for their choice of games**

### Experiment Design

For our experimental design, we wanted to see if our application would function in a scenario closer to our expected use case and we wanted to examine our application in that environment to observe and identify the issues with our design. To this end, we scheduled a “game night” and obtained volunteers to participate in the game night. We had initially attempted to find already scheduled game nights but were unable to find any within the time we were given. Instead, we obtained access to the Game Design Lab located in Meserve Hall in Northeastern because it had numerous games available. We obtained three volunteers and asked them to show up for an hour and a half to test our application. We prepared a room in our application containing all the games the room had in preparation and we set up a table in the middle of the Game Design Lab for our participants to sit around. The collection of games was situated on a set of shelves next to the table.

Our volunteers were three Northeastern Graduate students, One participant hereafter referred to as Participant #1 was from the College of Engineering. Participant #2 was from the College of Computer Science, and

Participant #3 was from the College of Arts, Media, and Design. All three participants identified as male. Preceding the experiment we gave them a briefing, asking them to select a game to play from among the games in the room and showed them a quick demonstration of the major features of our application, letting them know that their use of the application or any of its features was completely optional. After our experiment, we asked each participant about their board game habits and all three indicated that they played infrequently.

During our experiment, we focused on observing the social interactions between participants, including verbal and nonverbal cues. We looked in particular for any expression or tone that indicated frustration or confusion, such as head-scratching, extended periods of silence from a participant, or hesitation. We also noted the content and tone of how they talked to each other, and how they came to decisions regarding what filters to apply, how to initiate voting, what each member voted for, and requests for confirmation at any stage of the process. We also wanted to note how participants interacted with our application, including if they elected to use and continue using it.

In addition, we performed two sets of interviews, one immediately after the group selected a board game and one at the end of the experiment. After selection, we asked if they encountered any issues with the process and if they felt the application assisted in the process. After the session, we asked participants if they were satisfied with the game they selected and if they would consider continuing to use the application. Once we noticed that participants were unfamiliar with most of the games available we also asked if they felt that their unfamiliarity with those games hindered their decision or satisfaction with that decision.

## RESULTS

Our experiment began at 5:11 pm on April 16, 2019, and ran for over an hour until 6:30 pm. After we delivered the briefing and demo we began the observation, giving them the instruction to “select” and “play” a board game from the ones that were available. Within the study, the participants voted on games twice using our application and played one game.

Initially, participants looked at the physical collection of games, looking at several different boxes, picking them up and examining them. Participant #3 very quickly voiced a suggestion to play the game Dominion, citing that it “looks interesting” and that he “really likes the cover with knights and kingdoms.” Participant #3 later suggested that the game Nature Fluxx looked interesting based on its box.

There were a few errors in our experiment setup that caused difficulties in our experiment. Firstly, we erroneously added a game to the “room” our participants were using that was not available to play. After the first round of voting, participants decided to play UNO Dominos but were unable to find it. After a while, they started another voting round and ignored that game as a potential option. Another error was that our database had miscategorized the difficulty and category of Chess, which led to some statements of incredulity from Participant #3, although the participants dismissed the game as being a potential option because it only allowed for two players.

For the first round of voting Participants initially applied every single filter in order. However, as they applied each filter, communicating with each other what was being entered and what their preferences were they began to go back and modify certain filters as the list of games went down to only a couple games or even no games at all. Participant #3 said out loud how many games were listed after each filter was applied.

The group found that there were no games for medium difficulty and no games in the fantasy category, so decided to deselect all the category filters and include more complexities than just medium. In addition, they initially had the time restriction set from 30-40 minutes but they later expanded that to 10-60 minutes to show more games. During this time Participant #1 asked if the others wanted to start voting, but the other two participants continued to change the filters until they were more satisfied with the list of games.

In the first round of voting participants selected from 8 games to vote for. Participant #1 voted for three games, Participant #2 voted for four games, and Participant #3 voted for five games. As mentioned before UNO Dominos won, but participants searched the shelves where the games were located and were unable to find the game. For the next several minutes, participants and us researchers searched for the game before we informed the participants that the game had been erroneously added by us and that they would be unable to play that game, though they were still free to do as they wished otherwise.

After this, the participants elected to return to the application on their phones and start voting for another game. At this point Participants #1 and #3 both expressed thoughts regarding the filters. Participant #1 noted that he was able to modify the filters, and then stated that “If only one person can modify it can take a lot of time if there are a lot of people”. Participant #3 agreed and also mentioned regarding viewing the filters that “it would be awesome if I didn’t have to refresh [the page]”.

## Post-Selection Responses

Post-Selection Questions and Responses	Were there any issues that you ran into with deciding what game to play?	Did you feel that the application helped in selecting a game?
Participant #1	"Filters would be a problem if there were something like 60 people all trying to make their preferences known"	Yes
Participant #2	Said he was happy with the final result, noted there were lots of options for categories/mechanics, a "toggle all" option would be preferred	"Definitely"
Participant #3	Agreed with Participant #2 regarding the "toggle all" button idea for categories and mechanics	Yes

Table 1) Table of participant's responses to our post-selection questions.

After performing the same process of selecting filters (with less discussion this time), Participant #2 asked the others if they were ready to vote. Both replied in the affirmative. During this round of voting, each participant voted for three of the five games that were listed. The game that won this round was Coup, which was present on the shelf. At this point, we interrupted to ask the participants the following questions regarding the selection process and noted their responses.

Although we knew that positive responses regarding the second question would be of limited use to us since all participants were people at least one of us knew we elected to ask anyway so we could note if there was any extreme dissatisfaction with the application.

After our interview, the participants unpacked the box for Coup and started setting up the game. None of the participants had played the game before so Participant #3 said to the others "how about we spend one minute getting familiar with the rules?" Participants then spent the next four minutes reading the description on the game info page of our application and examining the game pieces. They then agreed to start the game.

During the start of the game Participants #1 and #2 were mostly quiet. Participant #2 scratched his head. Participant #1 quietly asked "How about we change the game?" although the other participants were also talking at the same time about how to start and either didn't hear him or ignored the suggestion. The rulebook was set out on the table and the participants took turns

reading it as the others finished setting up the game. Participant #1 asked "how does someone win?" and went to check the manual. After that, the participants played rock-paper-scissors to decide who went first. For the first several "turns" of the game, all players were mostly quiet and serious, but once they started understanding the game rules they started laughing and raising their voices in excitement during play. Participant #3 ended up winning the game. After the game had concluded we asked the group if they wanted to continue since it was 6:10 pm, near the end of the duration we had asked participants to stay for. After they expressed that they wanted to move to the interview we began with our post-session questions, followed by demographics questions and questions about their board game playing habits.

## DISCUSSION

Based on our interview questions and observations we still found that users were confused with certain aspects of our design. Previous experiments with earlier prototypes indicated that users were often confused and made mistakes in navigating the interface to access the main functions of our application. However much of the comments regarding participants frustrations were tied to shortcuts in our prototype, not to navigation with our applications functions. We believe that this shift in the nature of mistakes that were made was a result of us adding a short demonstration of our software beforehand. We specified actions that we "disallowed" because of limitations in that

### Post-Session Feedback

Post-Session Questions and Results	On a scale from 1-5, with a 5 being extremely satisfied, how satisfied were you with the game that was selected?	Did you feel that not knowing the games hindered your decision or satisfaction?	Would you use this application in your own life?
Participant #1	4	Yes, thought the description was too long	Yes, but only if there were more than three games to decide on
Participant #2	5, "I did not know the game at all. But after it was selected and I got to play I enjoyed it."	Yes, needed time to figure out the game thought the description helped a little	Yes, would use the app if there were more than three players, and if
Participant #3	5, He didn't realize the game was something he would enjoy until he started playing it	No	Yes, but questioned the need for the party host role, asked "what's the point? Wouldn't it be more efficient to just have everyone [add filters]?"

**Table 2) Table of participant's responses to our post-game-night questions.**

### Demographic Questions

Demographic Questions	What is your gender	Are you a grad student?	How often do you play board games?	What type of board games do you generally play?	How much time do you take to decide on which board game to play and how do you decide?
Participant #1	Male	Yes	"Only when cousins are around"	Card games such as UNO and poker, and strategy games like monopoly	Depends on the group
Participant #2	Male	Yes	Once every couple of months	Monopoly and poker	Quick, Usually, it's just whatever is available. We usually pick a random game, but I like to explore.
Participant #3	Male	Yes	Monthly	Primarily chess	Select pretty quickly, usually based on the game's picture and title. "Like picking a restaurant"

**Table 3) Table of participant's responses to our questions about demographic and playing habits.**

demonstration, but that emphasis may only have drawn attention to those parts of our prototype.

One of the difficulties with our design was the fact that we were unable to simulate different permissions for different users. In our demonstration, we had to make clear particular users were only permitted to perform certain actions, even if all users technically could perform those actions. Specifically, updating filters and beginning the voting process were two actions only the party host role could perform. Despite attempting to explain this in the demo, Users were sufficiently confused enough to ask us for confirmation or clarification as to what to do with regards to those elements during our observation. These factors, combined with the aforementioned mistakes in our room setup meant that at several points in the experiment users had to stop what they were doing to figure out what was going on or why there was a discrepancy in what they were doing and what was being displayed. In particular, not having UNO Dominos as one of the available games caused a ten-minute delay before participants returned to voting for another game. Another limitation of our prototype was that the filters page needed to be refreshed for users other than the party host, which even though they knew that it was a shortcoming of the prototype, both of the non-host participants said were “frustrating”. This was due to the fact that we were unable to implement hot reloading in our software prototype.

The behavior might also have been affected by participants’ perceived pressure of our expectation to perform well. We noted that all three participants often participated in the same activities such as reading the game description together, examining the game components, and taking turns reading the game rules. There was hardly any delegation of tasks or divergence in actions.

Solutions for most of these issues could be solved from a more robust prototype. Implementing more closely how we intended the app to function would allow us to let the app communicate the availability of those actions, instead of us having to rely on our explanations. Still, we decided to re-examine the decision to have only the party host able to affect filters. Participants did express preference for being

able to have multiple people modify filters, even if most of their complaints were around the instructional limitations we imposed.

One aspect we did not expect was how participants being unfamiliar with the games at hand would affect their interactions and perceptions of our application. Two of our three participants felt that not knowing the games they were deciding on hindered their ability to come to a decision, but all three felt that the application facilitated selection of a game and was satisfied with the game selected. Our intended users would be groups of people playing games that they owned, meaning at least one player would probably be familiar with any given game. We had assumed that whichever players were familiar with a game would be able to communicate the game rules and only included game details as a way for users to get a brief understanding of the game for the purposes of voting but all of our participants turned to the game details as their primary method to learn about the game.

## CONCLUSION

We presented “ReadySelectPlay”, a board game selection application intended to aid in the process of group communication of board game groups and to aid with filtering games. The application is aimed at aiding the process of communication and group decision making during board game nights. It is not intended to be a substitute for the entire communication process, rather it aims to ease the process. The group is still expected to discuss their preferences and communicate the list of preferences to the party host who would be using ReadySelectPlay to apply these filters and see the resultant effects on the list of games.

Based on the interview questions, all our participants gave either a 4 or 5 out of 5 regarding satisfaction with the game that was selected. However, a limitation of our study was that we were only able to obtain three participants during a single game night. In the future performing user testing with a larger and more diverse group of testers would allow us to collect better data to reflect the success/failure of our system. Additionally, observing a larger variety of group sizes would better allow us to see how our application affects the communication and decision process. Another

shortcoming was that we were only able to test with grad students who were not particularly active board game players. We feel that groups who play board games very frequently would be more in line with our target users for this application. Another change we would like to implement in future testing is the need to set aside more time for each testing session to better avoid the potential for Need for Closure (NFC) to affect participants' decision making as per research by Franco et al. [8]. One final takeaway was that we should look to find already established groups of board game players because we were unable to find a "real" game night party that was already happening that we could observe, and thus had to end up simulating a game-night with a smaller group for the purposes of testing.

For future development, there are several features we were unable to implement that could be added for future testing. Time constraints limited our ability to explore these features but they remain as options to explore later. Among those features is the ability for users to manually add unlisted games, allowing users to duplicate rooms to allow for easier setup of additional rooms, and providing the ability for users to manage logins and sessions.

Overall, if we iterate more on the design of our application like implementing a more robust implementation of user accounts, and exploring the alternative of allowing all attendees to apply filters instead of just the party host, then we believe ReadySelectPlay, with its features that include a way to organize party attendees/games, the ability to filter games based on preferences, and a voting system for users to decide on a game to play, could be a useful tool in addressing issues with group decision making that can arise during a board game night.

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