"Your Turn!": Playing Cooperative Modern Board Games to Promote Perspective Taking and Cooperative Attitudes

Yu-Chi Wang, Jenifer Doll, and Keisha Varma,
wang6691@umn.edu, dollx066@umn.edu, keisha@umn.edu
University of Minnesota – Twin Cities

Abstract: Though social and emotional learning (SEL) interventions successfully foster enhanced social, emotional, and academic outcomes, the research on engaging methods for teaching specific skills has been limited. This study investigates the potential for modern board games to foster SEL competencies through Cooperative Learning Theory. Because cooperative modern board games combine motivating gameplay and designs that align with elements from Cooperative Learning Theory, they may enhance cooperative attitudes and perspective taking skills. In this pre-test/post-test quasi-experiment, middle school students played either a cooperative or competitive board game. Students who played and highly enjoyed the cooperative game showed significantly greater increases in perspective taking skills after gameplay (F=11.42, p=.001), suggesting that playing enjoyable cooperative modern board games may be associated with increased perspective taking skills. Our findings suggest the need for further investigation into board games as a low-cost platform for students to practice SEL skills outside of the formal classroom environment.

Keywords: Social and Emotional Learning, Cooperative Learning, Board Games, Games

Introduction

In our collaborative society, strong social and emotional competencies are a must for working with others successfully in the classroom, the workplace, and throughout daily interactions. Social and Emotional Learning (SEL) interventions enhance the competencies of self awareness, self management, social awareness, relationship skills, and responsible decision making (Collaborative for Academic, Social, and Emotional Learning, 2015) and lead to increased academic achievement and reduced behavioral misconduct (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). However, research has not fully examined the effectiveness of teaching specific skills within these competencies (Durlak, et al, 2011) or the effectiveness of different teaching methods (Hromek & Roffey, 2009). Further, current research on SEL interventions has not focused on the extent to which students enjoy or are engaged in these interventions.

Games are an engaging way for students to participate in experiential learning. Some games are used within SEL interventions, alongside role playing for students to practice certain skills (Durlak, et al, 2011). For example, Hromek and Roffey (2009) explore the potential of therapeutic board games to promote SEL for young children. Commercial modern board games have not been studied in this context. These games are developed within game design paradigms oriented toward consumer engagement rather than education, so we predict that they should be more enjoyable and engaging. They can potentially also be a way to reach students who may not enjoy collaborative learning in formal learning environments. Because players have to work together to play the game and regulate the rules (Xu, Barba, Radu, Gandy, & MacIntyre, 2009), they are already cooperating by successfully playing a game together. Cooperative play has been shown to increase cooperation and perspective taking skills (Zan & Hildebrandt, 2003). In particular, cooperative modern board games further necessitate that players work together due to the goals structure and mechanisms and may be especially successful for increasing these outcomes. Thus, we predict that cooperative modern board games are an accessible and low cost medium through which players can practice and enhance cooperative attitudes and perspective taking skills.

Modern board games

Both popularity of and innovation within board games have soared during the current Board Game Renaissance (Wingfield, 2014), despite the prevalence of digital games. Since many modern board game players identify "social interaction" as the most enjoyable aspect of gameplay (Woods, 2012), the face-to-face, rather than digitally-mediated, interactions may be a major draw to play these games. We propose that these board games provide a supportive environment where players can develop and practice social skills. Players are physically present and have guiding principles – the game rules – to structure and facilitate social interactions. They can also learn through social learning by observing other players' behaviors in spontaneous interactions.

Cooperative learning

Although many have distinguished between cooperation and collaboration (e.g. Jeong & Hmelo-Silver, 2016), there is considerable overlap in practice. Because Cooperative Learning Theory has been cited as a theoretical basis for many SEL interventions, and this theory does not draw significant distinctions between the two, this paper will use "cooperation" simply to include both concepts. Cooperative Learning is a way of structuring education so that students work cooperatively towards learning goals (Johnson & Johnson, 1969). It is based on Social Interdependence Theory, which posits that the way goals are structured influences how individuals interact and, subsequently, the outcomes (Deutsch, 1949) Cooperative Learning has been shown to result in greater interpersonal attraction, academic achievement, and cooperativity (Slavin, 1990). Also, "students learn how to communicate effectively, provide leadership, help the group make good decisions, build trust, repair hurt feelings, and understand other's perspectives" (Johnson & Johnson, 1999). These skills fall under the "relationship skills" and "social awareness" SEL competencies.

Johnson & Johnson (1989) proposed that successful cooperative learning environments have five essential elements: (1) positive interdependence, that participants perceive they are reliant on one another to achieve their goals; (2) individual and group accountability, that both the individual and the group perceive responsibility for completing their tasks; (3) promotive interaction, that participants are supportive and take personal responsibility for the success of others; (4) appropriate use of social skills; and (5) group processing, time for the students to reflect on their abilities as a group. Modern board games present a case for increasing cooperative attitudes, because many of their design elements align with these essential elements of cooperative learning. First, task interdependence occurs because players will have to wait for others to complete their turn(s) in order to continue to their own turn(s). Also, because all players are sharing one set of game components (e.g. one board or one deck of cards), there is also positive resource interdependence. Second, modern board games usually require in-person, face-to-face promotive interaction. Additionally, playing modern board games tends to require interpersonal and small group skills, as most games take two to four players and can only be continued if everyone works together at least to a certain degree.

In addition to these inherent qualities of most modern board games, regardless of goal structure, it was predicted that cooperative modern board games would promote cooperative attitudes and perspective taking skills more than competitive modern board games. Cooperative modern board games have an added component of positive goal interdependence, sometimes positive role interdependence, individual accountability, and often spontaneous group processing. Although playing the competitive game may be associated with an increase in competitive attitudes after play, it was expected that their cooperative attitudes may also increase, because most modern board games themselves include multiple forms of positive interdependence, as mentioned before.

The focus of this research is to look into engaging and enjoyable ways for students to practice and enhance their social and emotional competencies. Because cooperative learning has been empirically shown to be successful in enhancing social skills, and because mechanisms of cooperative board games align well with the essential elements of cooperative learning, modern cooperative board games may be successful in enhancing social skills as well. Thus, the research questions are: 1) How does playing modern cooperative board games, compared to competitive ones, affect cooperative attitudes? and 2) How does playing modern cooperative board games, compared to competitive ones, affect perspective taking skills?

Methodology

Participants and procedures

Through a partnership between the University of Minnesota and a local Midwestern middle school, 91 seventh grade students, from 5 different class periods, participated in this quasi-experimental study. About 38.5% of participants self-identified as "girl", "woman", or "female", 55.8% "boy"/"man"/"male", and 3.8% other. Approximately 37% of participants were people from traditionally underrepresented racial and ethnic populations. Classes were randomly assigned at the class level to either the cooperative or competitive game condition. Because of unequal numbers of students across class periods, there were 39 participants in the Competitive condition and 52 in the Cooperative condition.

Each student participated during one 45-minute school period a day for three consecutive days. On the first day, participants completed pre-test measures, learned the game, and played a practice round of the assigned game. On the second day, participants played the game in a randomly assigned group of 3-5 students during the whole class period, playing the game an average of 1.5 times. On the last day, participants completed post-test measures.

Materials and measures

Participants in the Cooperative condition played Hanabi™ (Bauza, 2015), and those in the Competitive condition played Abracada…What?™ (Kim, 2014). These games were chosen based on similar mechanics and were rated equivalently difficult on the premier board game forum (http://boardgamegeek.com). Hanabi™ requires players to work together to play cards one through five sequentially in each of five different suits. No player can see their own hand and must work together to give hints to other players. Abracada...What? ™ also does not allow players to know their own tiles. Players compete with one another to accurately guess what spells they have to defeat their opponents.

For the pre-test, participants were given print copies of the questionnaires, the order of which was randomized between classes. Each questionnaire included questions and answer choices in English and Spanish. Cooperative attitudes were measured through the Cooperative (COOP), Competitive (COMP), and Individualistic (IND) Attitudes scales (Johnson & Norem-Hebeisen, 1969). The 22 total questions across these subscales, measuring liking and valuing of each interdependence condition were randomized. The tendency to utilize perspective taking skills was measured using the Perspective Taking (PT) subscale of the Interpersonal Reactivity Index of empathy (Davis, 1983). This subscale consisted of 10 questions. Participants responded to each question across the subscales using a 4-point scale from "strongly disagree" to "strongly agree". During the post-test, students completed the same scales as well as a manipulation check to ensure that the games were indeed viewed as cooperative or competitive, respectively, demographics and a post-questionnaire regarding their understanding and enjoyment of the game, relationships with classmates, and an open-ended response on what students thought they learned

Analysis and results

In accordance with previous data analyses of these measures (e.g. Johnson, et al, 1979), the data were treated as continuous and scores for individual items were summed to create one value for each scale. Participants' post-test scores on each of the scales (COOP, COMP, IND, and PT) were regressed onto the corresponding pretest scores to provide a standardized residual. These represented differences of actual and expected posttest scores based on pretest, as was used by Jung, McMaster, and delMas (2017). The standardized residuals were used as the outcome variables in a multivariate analysis of variance (MANOVA) comparing the students who played the cooperative versus competitive game. Because students were randomized at the class level, we calculated intraclass correlations (ICCs) for each scale. All of these ICCs were less than .01, thus students were treated as the unit of analysis. Students' open ended responses were analyzed using content analysis.

Though we had predicted that the cooperative game would lead to greater cooperative attitudes and perspective taking skills, and these effects found were in the expected direction, there were no significant main effects between the cooperative and competitive conditions on either the cooperative attitudes or perspective taking skills ($F(4,84)=0.153$, Wilks' $\Lambda=0.993$, $p=.961$). In investigating potential confounding variables, we evaluated the students' responses to the game conditions, we found that participants in the cooperative condition reported significantly lower enjoyment of game ($t(82.97)=2.76$, $p<.01$). Thus, additional analyses were conducted to see whether enjoyment affected students' results. Conducting a MANOVA with the game condition and enjoyment as predictors on the same dependent variables, the main effect of game condition was still not significant ($F(4,81)=0.964$, Wilks' $\Lambda=0.753$, $p=.559$). However, enjoyment of game was marginally significant ($F(4,81)=2.388$, Wilks' $\Lambda=0.894$, $p=.059$) and the interaction of game condition and enjoyment was significant ($F(4,81)=3.935$, Wilks' $\Lambda=0.837$, $p=.006$). Upon conducting post-hoc tests and adjusting the alpha levels for multiple tests, COOP was not significant ($F(3,84)=2.208$, $p=.09$) though those in the cooperative condition did have higher cooperative attitudes as predicted, PT was significantly affected by the interaction of game condition and enjoyment ($F=11.42$, $p=.001$), with higher reported enjoyment in the cooperative game condition having statistically significant higher PT than expected from pretest.

Students mostly reported learning game rules and strategies for gameplay in the open-ended response. However, some students in the cooperative game condition also noted that they learned cooperative skills whereas those in the competitive condition more often reported learning deduction or probability skills.

Discussion and limitations

Based on the statistically null main effects of game condition on cooperative attitudes and perspective taking skills, we do not have evidence to support our prediction that cooperative attitudes and perspective taking skills will increase more when playing cooperative as opposed to competitive modern board games. However, further analyses revealed a significant interaction between game condition and enjoyment on perspective taking skills, suggesting that enjoying playing a cooperative board game may be related to increases in students' self-reported

perspective taking skills. Those who reported not enjoying the game were likely less meaningfully engaged and/or motivated to fully participate. Differences in enjoyment between games could be due to the theme tied to the mechanics or the physical game components, among other aspects that are game-specific. This finding suggests that the results may not have been solely based on goal structure, but also on other factors tied to the particular games

Thus, only having one game per condition was definitely a major limitation; utilizing only one game per condition cannot rule out that other games with the same goal structures may lead to different results. Additionally, participants were only exposed to the game for a total of one hour across the three days, which is likely not enough exposure to truly change attitudes or skills. According to Johnson and Johnson (1989), cooperative learning interventions require time. Further, even if these games can affect students' perspective taking skills and cooperative attitudes, we must keep in mind that these results may not transfer to a formal learning environment. The next iteration of this study will include a series of different modern cooperative versus modern competitive games, to be played over a series of months, so as to try to better control for enjoyment and provide a more effective dosage. Additionally, we plan to incorporate more observational and qualitative data collection and unobtrusive measures, such as how far apart students sit and how they interact with one another when setting up or cleaning up games.

The findings of this study support that further research in this domain may be warranted. This research has the potential to help students work on social and emotional competencies in an enjoyable and engaging way that may not require as much adult supervision or training. Because board games are low-cost and accessible, they have the potential to help reinforce SEL outcomes in a broad range of adolescents, including under-represented populations who may not have the resources or opportunities for learning SEL *outside of the classroom*. More generally, connecting with a world of diverse individuals requires strong interpersonal and social skills and knowing how to interact with others can go a long way to bolster successful interactions with diverse others.

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