Title: Daily and season-long fantasy sports participation and gambling-related problems among a sample of college students at three universities

Abstract

Traditionally, fantasy sports have been played in season-long leagues, but recently daily fantasy sports (DFS) have emerged, allowing participants to play fantasy contests over shorter periods of time. Although participating in fantasy sports contests with entry fees or deposits could be considered a form of gambling, very few studies have examined associations between fantasy sport participation and gambling-related problems. Using a 2016 sample of college students (N =941) at three institutions, this study examined associations between fantasy sports participation (season-long and DFS) and (1) gambling, (2) gambling frequency, and (3) endorsing DSM-5 gambling disorder (GD) criteria. We found that engagement with fantasy sports and paying to play increased the likelihood of gambling and more frequent gambling. Respondents who paid an entry fee/deposit to play fantasy sports gambled more frequently than those who did not, and respondents who participated in DFS endorsed more DSM-5 GD criteria than those who did not. Because of the association found between DFS play and gambling-related problems in some participants, we suggest that mental health professionals who treat clients with gambling problems be cognizant of DFS and that some clients might be experiencing problems with DFS.

Introduction

In fantasy sports, participants draft and manage a team of real-life players and compete against the fantasy teams of other participants. Fantasy sport scoring is based on the actual statistics of the athletes on that fantasy team. Football and baseball are the most popular fantasy sports (Fantasy Sports Trade Association, 2017), but nearly every sport can be played via fantasy, including golf and NASCAR. Traditionally, fantasy sports are played in leagues over an entire season. In those leagues, there is often an entry fee, which is used to pay winnings to the most successful fantasy team manager(s) at the conclusion of the season. A new form of fantasy sports, daily fantasy sports (DFS), allows participants to play fantasy sports over a much shorter period of time (e.g., one day, weekend, or week) than traditional season-long leagues. These fantasy sport contests are played on DFS sites (e.g., FanDuel, DraftKings), where users create accounts to enter their lineups, deposit their entry fees, and receive their winnings. First-time DFS players might initially play for free with website promotions. However, with continued participation in DFS, participants will pay an entry fee for each fantasy sport contest they enter. As with season-long leagues, DFS participants select real-life players for their fantasy team. These participants compete against other participants' fantasy teams; teams that score the most points based on their players' actual performance win a portion of the jackpot derived from the contest's entry fees.

Much of the fantasy sports research in the peer-reviewed literature has examined fantasy sports participation from the sports management perspective, including motivations for participation (Brown, Billings, & Ruihley, 2012; Drayer, Dwyer, & Shapiro, 2013; Dwyer & Weiner, Online first; S. Lee, Seo, & Green, 2013), factors influencing participation (Drayer & Dwyer, 2013; W. Lee, Kwak, Lim, Pederson, & Miloch, 2011; Mahan, Drayer, & Sparvero,

2012), the impact of participation on sports fandom (Billings & Ruihley, 2013; Dwyer, Achen, & Lupinek, 2016; Larkin & Fink, 2016; J. Lee, Ruihley, Brown, & Billings, 2013), and the impact of league entry fees (Drayer et al., 2013; Mills, Kwak, Lee, & Lee, 2014). Fewer studies have examined fantasy sports from a gambling perspective. Those studies found that participating in season-long fantasy sports leagues with a league entry fee (which could be considered a form of gambling) is correlated with experiencing gambling-related problems in college student samples (Marchica & Derevensky, 2016; Martin & Nelson, 2014; Martin, Nelson, & Gallucci, 2016) and adolescent samples (Marchica, Zhao, Derevensky, & Ivoska, 2017). We located only one study in the peer-reviewed literature that examined the prevalence of DFS play and associations between DFS and gambling-related problems (Marchica et al., 2017). That study assessed a sample of 7^{th}-12^{th} graders and found that 6.5% of males and 1% of females participated in DFS; participation was correlated with an increased risk of experiencing gambling-related problems.

There are reasons to be concerned that DFS participation might be associated with experiencing gambling-related problems. Compared to season-long leagues, DFS has an enhanced potential to facilitate addiction because it is more rapid cycling and can lead to increased financial involvement from week to week. In addition, because DFS is novel and has evidenced a rapid increase in popularity, new exposure could be risky to groups vulnerable to gambling addiction. The Fantasy Trade Association (2017) found that among fantasy sports participants in 2016, average yearly spending is higher for DFS ($318) than season-long leagues ($184).

Another reason to be concerned about DFS and gambling-related problems is the similarity between DFS (with entry fees) participation and sports gambling. Though there is some debate in the field about the role of skill in legal definitions of gambling, paying entry fees

to play DFS contests is similar to paying entry fees to participate in poker tournaments, or wagering on sports outcomes. In DFS, instead of wagering on the performance of a team, DFS participants are paying entry fees in the hope of predicting the performance of individual players. Research has found that traditional sports gamblers are at significantly higher risk for experiencing gambling-related problems than participants of other gambling types (Kessler et al., 2008) and sports gamblers that experience gambling-related problems bet more often and with higher stakes (LaBrie & Shaffer, 2011). Despite the similarities between DFS and sports gambling, very few studies have looked at the potential co-occurrence of DFS and gambling-related problems. Examining this co-occurrence is important because gambling-related problems can cause a litany of negative financial and personal consequences, including withdrawal symptoms, significant distress, and jeopardizing relationships (American Psychiatric Association, 2013).

Because of the concerns about fantasy sports and gambling-related problems listed above and because there are so few examinations of fantasy sports, and particularly DFS, in the gambling literature, the objectives of this study are to (1) examine the prevalence of gambling, gambling frequency, gambling-related problems, and fantasy sports participation (season-long and DFS) among a sample of college students at three universities, and (2) examine associations between fantasy sports participation (season-long and DFS) and gambling behaviors and problems among that sample. Although the cross-sectional design of our study does not allow us to detect causal relationships, this study adds to the existing fantasy sports gambling literature by examining DFS participation and the association between DFS participation and gambling-related problems in a college student sample.

Methods

These data were collected in spring 2016 from college students at three US institutions: a private Southwestern university, a public Southeastern university, and a public Western university. This study received Institutional Review Board approval at each university. To recruit participants for the study, an email was sent to instructors (n=47) teaching general education courses required of all students. This email explained the purpose of the study, requested class time for one of the researchers to make a short recruitment announcement, and asked the instructor to forward a survey link to their students to complete the online survey. Of the 47 instructors contacted, 36 (77%) agreed to provide class time for a short announcement and to forward the survey email link to students.

Study researchers recruited participants via an in-class announcement that explained the purpose of the study and indicated that their instructor would be forwarding them a link to access the survey on Qualtrics (an online survey software program). In addition, the researcher stated to students that the online survey would not assess any identifiable information that could link them to the responses provided and that their internet protocol (IP) address would not be recorded or stored. Upon accessing the survey, participants were directed to a consent form that provided information on the purpose of the study and the safeguards to prevent identification. To reduce the possibility of participants completing duplicate surveys, an option in Qualtrics was utilized to limit multiple responses from the same IP address. At the end of the survey, participants were given the option to be redirected to another site to receive a $2.00 gift certificate as incentive for their participation.

The instructors who agreed to allow student participation had combined class loads of approximately 4,250 students. From these students, we received 982 surveys (i.e., 23%). We subsequently removed 41 surveys because there were missing responses to questions assessing

fantasy sports participation and/or past year gambling. Thus, we had 941 completed surveys (503 from the private Southwestern university, 271 from the public Western university, and 167 from the public Southeastern university).

Measures

Gambling and ***gambling frequency*** were assessed via a single item from the Gambling Quantity and Perceived Norms Scale (Neighbors, Lostutter, Larimer, & Takushi, 2002): Approximately how often do you gamble? That item had the following 10 response options: never = 1, once a year = 2, 2 to 3 times a year = 3, every other month = 4, once a month = 5, 2 to 3 times a month = 6, weekly = 7, more than once a week = 8, every other day = 9, and every day = 10. We did not define gambling or provide examples of gambling types to participants. For gambling analyses, we recoded this to a dichotomous variable: Those who gambled and those who did not. For our gambling frequency analyses, we treated this as a continuous variable (Range = 1-10) to create a gambling frequency score (a higher score corresponds with more frequent gambling). Past year ***gambling-related problems*** were assessed via the nine DSM-5 gambling disorder (GD) criteria (American Psychiatric Association, 2013). We summed the number of criteria endorsed and treated that sum score as a continuous variable.

Past year ***season-long fantasy sports participation and gambling*** were assessed through two questions similar to those used in previous studies (Martin & Nelson, 2014; Martin et al., 2016). The yes/no questions assessed whether respondents participated in fantasy sports (i.e., *In the past year, have you participated in a season-long fantasy sports league where you draft or auction players?*) and whether they participated in fantasy sports with a monetary fee (i.e., *In the past year, have you participated in a season-long fantasy sports league where you draft or auction players with an entry fee?*). Past year ***daily/weekly fantasy sports participation and***

gambling were assessed through two questions modeled from the season-long fantasy sports questions. The yes/no questions assessed whether respondents participated in daily/weekly fantasy sports (i.e., *In the past year, have you played day-long or week-long fantasy sports via FanDuel or DraftKings?*) and whether they deposited money to play daily/weekly fantasy sports (i.e., *In the past year, have you deposited money to play day-long or week-long fantasy sports via FanDuel or DraftKings?*). In addition to assessing these gambling variables, we also collected demographic information (i.e., gender, age, ethnicity, institution).

Data analysis

We used SPSS V22 (IBM Corp., 2013) to analyze our data. First, we calculated descriptive statistics on participant demographics, season-long fantasy sports participation (with and without entry fees), DFS participation (with and without money deposited), past year gambling, gambling frequency, and gambling-related problems. Next, we ran a series of bivariate analyses and regression analyses to examine associations between fantasy sports participation (season-long and DFS) and (1) past year gambling, (2) past year gambling frequency, and (3) past year gambling related-problems.

Gambling analyses: We used chi-square tests to examine differences in gambling (yes/no) among the entire sample by fantasy sports participation status (non-participants, season-long only participants, DFS participants). Next, we used a chi-square test to examine differences in gambling among season-long only participants between those who paid entry fees and those who did not. Similarly, we used a chi-square test to examine differences in gambling among DFS participants between those paid entry fees and those who did not. Finally, we performed a logistic regression analysis predicting gambling from: (1) whether the participant played season-

long fantasy or not; (2) whether they played DFS or not; and (3) whether they paid entry fees or deposit as part of their fantasy play.

Gambling frequency analyses: First, we used a one-way ANOVA test to examine differences in gambling frequency scores among those who gambled in the past year by fantasy sports participation status (non-participants, season-long only participants, DFS participants). Next, we used a one-way ANOVA test to examine differences in gambling frequency scores among season-long only participants between those who paid entry fees and those who did not. Similarly, we used a one-way ANOVA test to examine differences in gambling frequency scores among DFS participants between those paid entry fees and those who did not. Finally, we performed a linear regression analysis predicting gambling frequency scores among gamblers from: (1) whether they played season-long fantasy or not; (2) whether they played DFS or not; and (3) whether they paid entry fees or deposit as part of their fantasy play.

DSM-5 GD criteria analyses: First, we used a one-way ANOVA test to examine differences in the number of DSM-5 GD criteria endorsed among those who gambled in the past year by fantasy sports participation status (non-participants, season-long only participants, DFS participants). Next, we used a one-way ANOVA test to examine differences in the number of DSM-5 GD criteria endorsed among season-long only participants between those who paid entry fees and those who did not. Similarly, we used a one-way ANOVA test to examine differences in the number of DSM-5 GD criteria endorsed among DFS participants between those paid entry fees and those who did not. Finally, we performed a linear regression analysis predicting the number of DSM-5 GD criteria endorsed among gamblers from: (1) whether they played season-long fantasy or not; (2) whether they played DFS or not; and (3) whether they paid entry fees or deposit as part of their fantasy play.

Results

We received 941 completed surveys. Among this total sample, 503 (53.5%) participants were from the private Southwestern university, 271 (28.8%) were from the public Western university, and 167 (17.7%) were from the public Southeastern university. The mean age in the sample was 19.8 (SD=1.4) and the majority was female (69.7%) and white (68.9%). Among the total sample, 17.3% participated in season-long fantasy sports, 8.6% participated in season-long fantasy sports with league entry fees, 4.8% participated in DFS, 3.5% deposited money to play DFS, and 4.9% endorsed 1 or more DSM-5 GD criteria. Demographics of the sample and the prevalence of fantasy sports participation, gambling frequency, and the number of DSM-5 GD criteria endorsed are listed in Table 1. Figure 1 illustrates fantasy sports participation, including those who played with entry fees/deposits, among our sample.

Table 1 about here

Figure 1 about here

Gambling and fantasy sports participation among the sample

First, we compared past year gambling rates by fantasy sports status: (1) those who did not play (147/771; 19.1%), (2) those who only played season-long (68/125; 54.4%), and (3) those who played DFS (42/45; 93.3%). These three groups differed significantly in whether they engaged in past-year gambling, $\chi^2(2,N=941)= 171.4$, $p <.001$. Further, when the three groups were compared separately, season-long only players differed from those who did not play fantasy sports, $\chi^2(1,N=896)= 73.6$, $p <.001$, and DFS players differed from season-long only players, $\chi^2(1,N=170)= 22.0$, $p <.001$.

Next, we compared past year gambling rates between season-long only fantasy players who paid an entry fee (34/45; 75.6%), and those who did not pay an entry fee (34/80; 42.5%). These two groups differed significantly in whether they engaged in past-year gambling, $\chi^2(1,N=125)= 12.7$, $p <.001$. Then, we compared past year gambling rates between DFS players who deposited money to play (33/33; 100.0%), and those who did not deposit money to play (9/12; 75.0%). These two groups differed significantly in their gambling, $\chi^2(1,N=45)= 8.8$, $p <.05$. Finally, we performed a two-step logistic regression predicting whether a respondent was a gambler from: (1) whether they played season-long fantasy or not; (2) whether they played DFS or not; and (3) whether they paid entry fees or deposit fees as part of their fantasy play (see Table 2). In that analysis, all three predictors contributed significantly to the final model.

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Table 2 about here

Gambling frequency and fantasy sport participation among those who gamble

First, we compared gambling frequency scores (range 1-10 and higher scores correspond with more frequent gambling) among the following three groups of gamblers by fantasy sports status: (1) those who did not play (Mean=2.73, SD=1.0), (2) those who only played season-long (Mean=3.46, SD=1.4), and (3) those who played DFS (Mean=4.29, SD=2.1). These three groups differed significantly in their gambling frequency, $F(2,254)= 25.1$ $p < .001$. Helmert contrasts revealed that gamblers who played fantasy sports of any kind gambled more frequently than those who did not play fantasy sports ($p < .001$), and gamblers who played DFS gambled more frequently than those who played season-long only ($p < .01$).

Next, we compared gambling frequency scores between season-long fantasy only players who gambled and paid an entry fee (Mean=3.71, SD=1.5), and those who did not pay an entry fee (Mean=3.21, SD=1.1). These two groups did not differ significantly in their gambling frequency, $F(1,66)= 4.3$, $p =.13$. Then, we compared gambling frequency scores between DFS players who gambled and deposited money to play (Mean=4.33, SD=2.2), and those who did not deposit money to play (Mean=4.11, SD=1.6). These two groups did not differ significantly in their gambling frequency, $F(1,40)= 0.1$, $p =.78$. Finally, we performed a two-step regression predicting gambling frequency among gamblers from: (1) whether they played season-long fantasy or not; (2) whether they played DFS or not; and (3) whether they paid entry fees or deposit as part of their fantasy play (see Table 3). In that analysis, all three predictors contributed significantly to the final model.

Table 3 about here

DSM-5 GD criteria and fantasy sport participation among those who gamble

First, we compared the number of DSM-5 GD criteria endorsed among the following three groups of gamblers by fantasy sports status: (1) those who did not play (Mean=0.29, SD=1.1), (2) those who only played season-long (Mean=0.59, SD=1.4), and (3) those who played DFS (Mean=1.38, SD=2.5). These three groups differed significantly in number of criteria endorsed, $F(2,254)= 8.6$, $p <.001$. Helmert contrasts revealed that gamblers who played fantasy sports of any kind endorsed more criteria than those who did not play fantasy sports ($p < .001$), and gamblers who played DFS endorsed more criteria than those who played season-long only ($p < .01$).

Next, we compared the number of DSM-5 GD criteria endorsed between season-long fantasy only players who gambled and paid an entry fee (Mean=0.76, SD=1.7), and those who did not pay an entry fee (Mean=0.41, SD=1.7). These two groups did not differ significantly in number of criteria endorsed, $F(1,66)= 1.1$, $p =.31$. Then, we compared the number of DSM-5 GD criteria endorsed between DFS players who gambled and deposited money to play (Mean=1.55, SD=2.7), and those who did not deposit money to play (Mean=0.78, SD=1.6). These two groups did not differ significantly in number of criteria endorsed, $F(1,40)= 0.7$, $p =.42$. Finally, we performed a two-step regression predicting number of DSM GD criteria endorsed among gamblers from: (1) whether they played season-long fantasy or not; (2) whether they played DFS or not; and (3) whether they paid entry fees or deposit as part of their fantasy play (see Table 4). In that analysis, none of the three predictors contributed significantly to the final model.

Table 4 about here

Discussion

We found that (1) engagement with fantasy sports and paying to play increased the likelihood of gambling and gambling more frequently, (2) respondents who paid an entry fee/deposit to play fantasy sports gambled more frequently than those who did not, and (3) respondents who participated in DFS endorsed more DSM-5 GD criteria than those who did not. One potential explanation for the relationship found between DFS and gambling-related problems is the similarity between DFS and sports betting. As mentioned previously, traditional sports gamblers are at higher risk for experiencing gambling-related problems than participants of other gambling types (Kessler et al., 2008). Although we found that some DFS players were experiencing similar detrimental consequences as other problem gamblers, we were not able to

assess whether those consequences were specifically related to DFS play or to other forms of gambling (or both).

Structural differences between season-long leagues and DFS could explain some of the differences in findings between those fantasy sport-types. Most notably, gambling research has found that increased gambling frequency can be associated with experiencing gambling-related problems (LaBrie & Shaffer, 2011; MacKay & Hodgins, 2012). Those findings relate to this study, because as opposed to season-long leagues where rewards are delayed for several months, the rapid cycling of DFS provides daily or weekly rewards. Because of these differences in reward cycles, it is plausible that individuals with gambling-related problems that play fantasy sports would prefer DFS. Past work has also shown that individuals who engage in multiple different gambling activities, including online types, are, not surprisingly, more involved in gambling and more likely to experience problems (LaPlante, Nelson, & Gray, 2014). In many cases, associations between less prevalent gambling types, such as Internet gambling, and gambling problems, disappear when playing multiple game types is accounted for in analyses. It is possible that individuals engaged in DFS are those who are also engaged in multiple other gambling activities, and thus more likely to experience gambling-related problems.

Implications

Playing DFS is a relatively new phenomenon and could be considered a form of gambling. To our knowledge, this is first peer-reviewed study to assess DFS participation and associations between DFS and gambling-related problems among a sample of college students. We located one published study that examined the prevalence of DFS play and correlations between DFS and gambling-related problems among a sample of 7^{th}-12^{th} graders (Marchica et al., 2017). Consistent with our study, that study found that those who participated in DFS were

more likely to experience gambling-related problems. Further, that association is consistent with previous research looking at season-long fantasy sports participation and gambling-related problems among college student samples (Martin & Nelson, 2014; Martin et al., 2016).

Because this study and others have shown that participation in fantasy sports can be correlated with gambling-related problems, mental health professionals should be cognizant that fantasy sports (especially DFS) played with entry fees or deposits could be considered forms of gambling. As mentioned previously, excessive DFS play is especially concerning because the rapid cycling of games can quickly lead to problems, including financial-related problems. Mental health professionals who serve clients with gambling problems should be cognizant that clients might be playing DFS and that the current attributes of DFS play taken together (i.e., current legal status in some states, proliferation of DFS advertisements by DFS providers, widespread availability to play online or on a smart phone, the rapid cycling of games) could potentially add unique aspects to the treatment of DFS players experiencing gambling problems because of their DFS play. For instance, compared to other forms of gambling, it might be more difficult to avoid DFS-related triggers and cues, especially advertisements for DFS providers.

Because of the associations found between DFS and gambling-related problems in this study, there are potential policy changes related to DFS that could be considered. For instance, because some clients of DFS providers (e.g., DraftKings, Fan Duel) might experience gambling-related problems, those providers should consider better promoting gambling-related help, including gambling helplines and self-help materials, on their sites. In addition, policymakers could consider whether DFS should be regulated like other forms of gambling (e.g., lotteries, casinos).

Limitations

This study was limited by some factors that might have an impact on the findings. As mentioned previously, the cross-sectional design of this study allows us to detect only correlations and not causal relationships. Another limitation was our use of a convenience sample from three institutions. Consequently, this sample might not be representative of other populations of college students at other institutions throughout the country. Further, we relied on participants to self-report behaviors over the past year and there is the potential for participant recall bias of their behaviors over that time span. There are other potential limitations due to the wording of our fantasy sports questions. First, since we asked about depositing money in the past year for DFS, we might have missed individuals who play DFS very seriously and have not deposited in the past year because they already had a bankroll set up. In addition, we asked about playing DFS via DraftKings or Fan Duel, which are the two most used DFS sites; however, we might have missed individuals who played on other less-known DFS sites. Finally, another potential limitation is not including a definition of gambling on our survey, as some respondents may have interpreted their fantasy play as gambling and others might not.

Future Directions

Because so little is known about the association between fantasy sports play (DFS or season-long) and gambling-related problems, future research should assess these behaviors among larger, more diverse samples to better understand the relationship. In order to avoid issues with self-report recall bias, it would be advantageous to examine the actual DFS behaviors of DFS participants similar to the series of studies that examined the actual betting behaviors/patterns of subscribers to an internet sports gambling service (e.g., Braverman, LaBrie, & Shaffer, 2011; LaBrie, LaPlante, Nelson, Schumann, & Shaffer, 2007; LaPlante, Schumann, LaBrie, & Shaffer, 2008).

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