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Factors predicting desired autonomy in medical decisions: Risk-taking and gambling behaviors

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Abstract

This study investigated factors that influence patients' desired level of autonomy in medical decisions. Analyses included previously supported demographic variables in addition to risk-taking and gambling behaviors, which exhibit a strong relationship with overall health and decision-making, but have not been investigated in conjunction with medical autonomy. Participants ($N = 203$) completed measures on Amazon's Mechanical Turk, including two measures of autonomy. Two hierarchical regressions revealed that the predictors explained a significant amount of variance for both measures, but the contribution of predictor variables was incongruent between models. Possible causes for this incongruence and implications for patient–physician interactions are discussed.

Keywords

autonomy, decision-making, gambling, regression, risk-taking, trust in physicians

Given the escalating threat of chronic illness in society, behavioral factors and psychological traits that contribute to overall health and well-being are imperative to investigate. A central component to explore in relation to this issue is the role patients prefer to play in their medical decision-making process: do they prefer to be active, to be passive, or to have shared decision-making with their doctors? Traditional shared decision-making (SDM) paradigms indicate a need for adequate balance between patient and provider inputs, but newer perspectives challenge the potential efficacy of these more balanced approaches. While it is irrefutably imperative for healthcare professionals to consider the individual patient's needs, history, and unique circumstances before making medical decisions, an egalitarian approach to medical decisions creates a potentially hazardous scenario for certain patients. Existing literature indicates that various traits are predictive of the amount of autonomy patients' desire in medical decisions, and despite the evidence that gamblers are a population of individuals who tend to be more likely to exhibit poorer health and suboptimal decision-making, the relationship between autonomy in medical decisions and gambling behaviors has yet to be considered.

Patient autonomy

Autonomy is self-governance over decisions; a decision or choice of action is considered autonomous if it comes from within and is free from external control or influence (Deci and Ryan, 1987; Kasser and Ryan, 1999). A key aspect of self-determination theory (Deci and Ryan, 1987), autonomy is argued to be a fundamental human right deserving of respect and protection (Entwistle et al., 2010; Hofmann and Lysdahl, 2008). It has been found that autonomous decision-making results in more persistent and consistent behavior, greater satisfaction in decision-making, and overall greater well-being (Deci and Ryan, 1987; Kasser and Ryan, 1999; Ryan et al., 2008). For these reasons, healthcare personnel and institutions are encouraged to be autonomy supportive by enabling patients to exercise their ability

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to make their own decisions regarding various healthcare options (e.g. screening procedures, medications, surgery, differential treatment paths, etc.) that match their personal values and preferences (Hofmann and Lysdahl, 2008; Sandman and Munthe, 2010).

The importance of the individual patient's needs and special circumstances has been a catalyst for healthcare providers using a variant of SDM that gives greater weight to the patients' input—the person-centered approach (PCA). While this approach initially appears to be patient-empowering and a potentially a good way to enhance treatment adherence and outcomes, the PCA can be conceptualized in a number of different ways, which has far-reaching implications for not only the patients but also for the healthcare community and population at large (Munthe et al., 2012). A PCA that allows for too much patient autonomy gives rise to obvious issues—the patients lack the medical knowledge and experience their healthcare providers possess—but this approach also fails to recognize the well-known limitations of the human mind. Patients and practitioners alike will rely on certain cognitive heuristics when making medical decisions (see Sox et al., 2013 for a comprehensive review), which implies that decision accuracy might be sacrificed to some extent. However, in a context in which a patient has just received a serious, potentially life-altering medical diagnosis, an individual's decision-making limitations are further exacerbated due to cognitive overload (Epstein and Street, 2011). Advocates of placing less importance on patient autonomy during the decision process feel as though the PCA should be "toned down" in certain health situations that involve potentially poor, or uninformed, decision makers (Herlitz et al., 2016).

In addition to what healthcare providers desire and what research indicates is the most ideal approach, it is equally important to consider what approach patients typically desire. Current research indicates patients prefer SDM, as opposed to taking a fully active role (i.e. total autonomy) or a fully passive role (i.e. no input) in decisions (Deber et al., 2007; Mazur and Hickam, 1997), but there are identifiable trends between preferred roles and population demographics. Greater autonomy is typically desired by women (Arora and McHomey, 2000; Cullati et al., 2011; Levinson et al., 2005), younger individuals (Deber et al., 2007; Ende et al., 1989; Hölzel et al., 2013; Thompson et al., 1993), and those with higher education (Arora and McHomey, 2000; Cullati et al., 2011; Deber et al., 2007; Hölzel et al., 2013; Levinson et al., 2005). Additionally, more control is desired by those who have made medical decisions in the past 6 months (Cullati et al., 2011) and those who are familiar with the related health condition (Deber et al., 2007), while less control is typically desired by those who place a higher value on health (Arora and McHomey, 2000) and those who face decisions related to more severe health conditions (Deber et al., 2007; Ende et al., 1989).

However, the need to look beyond the aforementioned variables is clear, as Ende et al. (1989) indicated that demographic characteristics and health factors could only explain 19 percent of the variance found in scores of their Autonomy Preference Index (API) for medical decisions. As such, one additional factor to consider is the amount of trust that patients have for their physicians. Researchers agree that trust in physicians is characterized by patients' acceptance of being in a vulnerable situation and allowing their physician to take action because of the patients' belief the physician will act in their best interest (Hall et al., 2002; Thom et al., 2004). Trust in physicians is imperative for the patient–physician dynamic; patients who trust their physicians are more likely to be satisfied with medical providers, follow treatment instructions, and have better overall health (Pearson and Raeke, 2000; Thom et al., 2002). Naturally, the amount of trust patients have for their physicians greatly affects the decision-making process because patients with lower trust in physicians exhibit a higher desire for autonomy, whereas patients with high trust in their physicians have lower desire for autonomy (Kraetschmer et al., 2004).

Reminiscent of findings regarding the desire for autonomy, current studies have also found trust in physicians to be influenced by patient age, gender, and education in the same manner (Boulware et al., 2003; Kraetschmer et al., 2004; Thom and Physicians Stanford Trust Study, 2001). The strongest demographic predictor of patient trust, however, has been reported to be race, with Black patients consistently reporting the lowest amount of satisfaction and trust in their physicians compared to White patients (Boulware et al., 2003; Doescher et al., 2000; Hughes et al., 2006; O'Malley et al., 2004). Interestingly, research also suggests that racial minorities, specifically Black and Hispanic patients, desire a more passive role when facing medical decisions. While the reasoning for this is still debated, it has been suggested that this might be a result of patients' lack of self-efficacy for making health-related decisions coupled with differential treatment from physicians who may unknowingly involve minority patients less in the decision-making process (Levinson et al., 2005).

Gambling

Because medical decision-making has been speculated to reflect one aspect of risk-taking behavior (Rosman et al., 2013), it is also important to look beyond demographic influences and trust in physicians to other, potentially influential, behavioral traits. Research regarding medical decision-making in the general population and in specific patient populations (e.g. those who suffer from diabetes, cancer, etc.) is plentiful, but there is no known research that specifically investigates medically based decisions for individuals who gamble and/or suffer from gambling disorders. It has been long understood that those who gamble are likely to exhibit risky behaviors in multiple different domains and

that "gambling represents one expression of a general propensity for risk-taking," as supported by factor analyses that exhibit shared underlying determinants (Mishra et al., 2010: 616). Additionally, a wealth of literature indicates that those who gamble are likely to exhibit an illusion of control related to decision-making, believing they have more control over situations than reality might suggest, which exceeds that of nongambling populations (Goodie and Fortune, 2013; Moore and Ohtsuka, 1999). Based on this information, it is fair to assume that both of these traits—risk-taking and the illusion of control—that have been shown to influence *general* decision-making abilities in those who gamble could result in differences in medical decision-making for this specific population as well.

While the relationship between gambling and medical decision-making has yet to be investigated, it is a relationship that warrants exploration due to the undeniable relationship between gambling and overall health. The high rates of comorbidity among gambling and other addictions is a well-documented finding, with roughly 60 percent of those suffering from disordered gambling exhibiting comorbid nicotine or substance dependence (Lorains et al., 2011); due to the known health detriments related to these substances, it is logical to infer that gambling populations are more likely than nongambling populations to suffer from particular health ailments. Even beyond substance-related health concerns, those who gamble are more likely to be considered obese and are more likely to suffer from chronic health conditions (Black et al., 2013; Desai et al., 2007), and gambling severity has been shown to be significantly related to poorer general health as well as poorer social and emotional functioning (Erickson et al., 2005). Additional research shows that adults aged 55 years or older with at-risk or problem gambling have a greater incidence of arteriosclerosis or "any heart condition" than other older adults (Pilver and Potenza, 2013). Furthermore, research even supports the fact that early onset gambling involvement can result in poorer health conditions, such that older individuals (aged 65+ years) who gamble, who started gambling before the age of 21 years, compared to those who started after the age of 21 years, not only exhibit greater gambling severity but also exhibit more severe medical and psychiatric problems (Burge et al., 2004).

Previous research findings support that an association exists between gambling and health problems, but cause and effect is not certain due to temporal ambiguity: pre-existing poor health may motivate people to start gambling or the lifestyle of the typical gambling population may lead to the development of poorer health. For example, it is possible that individuals with physically debilitating disorders seek out gambling because it is not physically demanding or as a means to escape or avoid facing their problems (Blaszczynski and Nower, 2002). In support of the competing temporal explanation, declining physical health could be attributed to the rather sedentary lifestyle they adopt, including more computer and TV use and the environmental hazards associated with casinos (Black et al., 2013; Desai et al., 2007; Erickson et al., 2005; Pilver and Potenza, 2013), or a result of physiological stress that gambling places on the body (Meyer et al., 2000). Furthermore, those individuals with diagnosed, disordered gambling tend to be more likely to avoid or delay regular and preventative medical care due to financial issues and thus also tend to have more emergency medical visits (Black et al., 2013).

As previously established, trust in physicians is a factor known to influence the amount of desired patient autonomy, and even though there is no current literature which speaks to the in relationship of gambling with this variable, additional gambling literature allows for certain inferences to be made. Gamblers tend to score higher on certain personality traits that indicate they possess a more cynical view of the world. One such trait is mistrust, where gamblers have been shown to be more likely to endorse statements reflecting skepticism of others' intentions and morals (Reid et al., 2011). Another, somewhat related, trait is alienation. As a subfactor of the Negative Emotional Temperament personality category (Patrick et al., 2002), gamblers score higher in this trait of alienation, which indicates that they believe they are treated unfairly by others (Miller et al., 2013). These types of feeling might impede the patients' ability to fully trust and communicate with the healthcare practitioner—a process that in some ways be more imperative to the SDM success than the decision itself (Dixon et al., 2016).

The current project aims to investigate various aspects of medical decision-making and how these decisions might be influenced by previously suggested demographics as well as self-reported risk-taking and gambling behaviors. If focusing solely on the amount of desired input in medical decision-making, there are a few existing measures to consider for use. A review of these measures suggests there is not one superior measure, but that the resulting findings for each measure might be impacted by framing effects (see Chewning et al., 2012). As such, this study includes two measures of medical decision-making for comparison purposes. It was hypothesized that the demographic variables of sex, age, race, and education, as well as one's current health condition and trust in physicians, would significantly impact the amount of desired autonomy in medical decisions, in a manner consistent with previous literature. Additionally, it was hypothesized that risk-taking and gambling activities would exhibit significant relationships with current health condition and lifestyle choices (e.g. substance use, body mass index (BMI), physical activity) and would further predict the amount of desired autonomy for medical decisions, such that higher rates of risk-taking and gambling will be associated with greater desire for autonomy. This desire for autonomy should be, at least in part, attributable to the smaller amount of trust in physicians that we expect to see in gamblers.

Method

Participants

A total of 203 people participated in the study with the data of 198 being retained after excluding those with missing data. The resulting data set included 90 women (45.5%) and 108 men with an age range of 20 to 74 years ($M = 33.73$, standard deviation (SD) = 11.38). The sample was cross-cultural (i.e. not limited to participants in the United States), which resulted in a sample of primarily Asian (46%), White (44%), and Black (6%) participants, all of whom had at least a high school diploma/General Educational Development (GED; 33%) with a majority of participants having a bachelor's degree (42%) or more advanced degree (25%).

Procedure

Participants received US$0.50 for completion of the survey on Amazon's Mechanical Turk (MTurk) system, which is a website used for the purpose of data collection in a variety of different disciplines. While this might appear to be an insignificant amount compared to in-person data collections, US$0.50 is typical for the MTurk system and research indicates that this amount results in adequate participation rates (Buhrmester et al., 2011). Participants needed a combined approval rating of at least 70 percent, meaning that those participants have been approved by 70 percent of the MTurk researchers for whom they have previously completed surveys. This approval rating demonstrates the ability to correctly complete surveys and follow directions, which makes this inclusion criterion important for obtaining reliable results. Participants were presented with an electronic consent form that indicated that they may discontinue the study at any time and did not have to answer any questions that they did not feel comfortable with. By continuing, participants signified their consent.

Measures

Comprehensive demographics and general health questionnaire. In addition to standard demographic items, this questionnaire assessed health information and personal medical history, specifically focusing on 11 serious health conditions: high blood pressure, heart trouble, stroke, lung disease, asthma, hepatitis, diabetes, heart murmur, arthritis, sexually transmitted disease, and cancer. Additionally, participants had the option to include "other" serious health-related issues that they experienced. Items were answered dichotomously (yes/no), indicating if participants had ever experienced these conditions in their lifetime and then used to create a health composite score ranging from 1 to 12. Reported height and weight were used to calculate a BMI for each participant.

Frequency of alcohol use was assessed categorically (nondrinker, mild/social drinker, moderate drinker, and heavy drinker) as was the amount of nicotine use daily (nonsmoker, <0.5 pack, 0.5–1 pack, 1.5–2 packs, and >2 packs). The following lifestyle habits were also assessed: amount of time spent watching TV daily (<1 hour, 1–2 hours, 2–4 hours, 4–6 hours, and 6+ hours), amount of time spent on the computer daily for non-work, recreational purposes (<1 hour, 1–2 hours, 2–4 hours, 4–6 hours, and 6+ hours), amount of times per week engaging in physical activity (once, 2–3 times, 4–5 times, and 6–7 times), and overall activity level at work (sedentary/retired, light, moderate, and heavy).

Diagnostic Interview for Gambling Severity-Screen. The Diagnostic Interview for Gambling Severity-Screen (DIGS-S) is an electronic, self-report version of the formal Diagnostic Interview for Gambling severity (Winters et al., 1996), which evaluates lifetime gambling behaviors based upon the *Diagnostic and Statistical Manual of Mental Disorders* (4th edn; DSM-IV; American Psychiatric Association (APA), 2000) criteria for pathological gambling with 20 multiple choice items using three response options ("*Very true*," "*Somewhat true*," and "*False*") (Fortune and Goodie, 2010). Each of the 10 DSM-IV criterions is assessed with two items, which are then scored as pairs, resulting in a total score ranging from 0 to 10. The DIGS-S has been shown to have good internal reliability ($\alpha s = .83-.89$) and test–retest reliability ($r = .62-.79$) over a 3-month period of time (Fortune and Goodie, 2010).

Trust in Physicians scale. This scale consists of 11 statements such as "*I doubt that my doctor really cares about me as a person*" and "*My doctor is usually considerate of my needs and puts them first*" that are answered on a Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*) (Anderson and Dedrick, 1990). High internal validity ($\alpha = .85-.89$) and test–retest reliability ($r = .77$) are supported (Hall et al., 2002).

Domain-Specific Risk-Taking scale, revised to include medical questions. The Domain-Specific Risk-Taking scale, revised to include medical questions (DOSPERT+M) is an extension of the original DOSPERT (Weber et al., 2002), revised to include a medical decisions subscale (Rosman et al., 2013). This 36-item questionnaire asks participants to rate how likely they are to engage in specific risky activity in different aspects of their lives, from 1 (*extremely unlikely*) to 7 (*extremely likely)* with six separate domains: financial decisions, health/safety, recreational, ethical, social, and medical decisions. The risk-taking scale has good reliability ($\alpha = .88$) across all items (Harrison et al., 2005).

Autonomy Preference Index. The original API consists of a decision-making preference index and an information-seeking index scored on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*) (Ende et al., 1989).

Table 1. Survey descriptives: internal reliability, averages, and correlations with gambling.

Measure	Cronbach's α	Mean (*SD*)	Correlation (*r*) with DIGS-S
API	.77	23.60 (4.86)	.13*
PSDM	.81	18.53 (4.31)	.37**
TIP	.86	39.07 (6.96)	−.24**
Health composite	.65	1.17 (1.57)	.40**
DOSPERT+M	.94	124.48 (38.41)	.43**
DIGS-S	.82	.84 (1.71)	–

SD: standard deviation; API: Autonomy Preference Index; PSDM: Problem-Solving Decision-Making scale; TIP: Trust in Physicians; DOSPERT+M: Domain-Specific Risk-Taking scale+Medical; DIGS-S:Diagnostic Interview for Gambling Severity-Screen.
*$p < .10$; **$p < .001$

The measure also includes three clinical vignettes that were not used for this study. This study utilized a version of the API sent by the corresponding author, which includes a 7-item Decision-Making (DM) index and an 8-item Information-Seeking (IS) index, and instructs participants to give their opinions regarding "*general health-related issues*." Given the purpose of this study, data from the DM index were used for analyses, which include items such as "*Patients should go along with the doctor's advice, even if they disagree with*" and "*If you were sick, as your illness became worse, you would want the doctor to take greater control*." Total scores range from 7 to 35 on the DM index, with higher scores indicating lower desired autonomy. The API–DM has strong internal reliability ($\alpha = .82$) and test–retest reliability ($r = .84$; Ende et al., 1989).

Problem-Solving Decision-Making scale. The Problem-Solving Decision-Making (PSDM) scale utilizes six questions regarding who should be responsible for determining diagnoses, risks and benefits, and treatment options for particular medical scenarios (Deber et al., 1996). While there are different medical vignettes to choose from, this study included the Chest Pain scenario, which reads as follows: "*Suppose you had mild chest pain for three days and decided that you should visit your doctor about this. Please answer the following questions regarding who should make the decision in each situation*." Decisions are based upon a 5-point Likert response from 1 (*the doctor alone*) to 5 (*me alone*), with higher scores indicating a higher desire for autonomy in medical decisions. Good internal reliability ($\alpha s = .71$–$.90$) is documented in previous research (Chewning et al., 2012).

Results

Gambling-related findings

All measures demonstrated acceptable internal reliability (see Table 1).

As expected, the DIGS-S exhibited a significant, positive correlation with the measure of risk-taking, the DOSPERT+M ($r = .43$, $p < .001$), indicating that those with greater gambling pathology exhibit greater risk-taking across all domains. DIGS-S also exhibits a strong, positive correlation with the health composite score ($r = .40$, $p < .001$), indicating that as gambling pathology increases, so does the number of health problems. Additionally and unexpectedly, DIGS-S scores were not related ($ps > .05$) to self-reported level of physical activity, TV use, computer use, or BMI ($M = 24.14$, $SD = 8.03$). Physical activity level at work, however, was significantly related to DIGS-S scores ($r = .18$, $p < .05$).

Additionally as predicted, the DIGS-S exhibited a significant, negative relationship with the TIP scale ($r = -.24$, $p < .001$), such that higher scores on the DIGS-S were indicative of having less trust in physicians. Finally, for the measures related to medical decision-making, the DIGS-S had a significant, positive correlation with the PSDM ($r = .37$, $p < .001$) and a positive trend with the API ($r = .13$, $p < .10$).

Regression models

Two separate hierarchical regressions were conducted using SPSS version 21, one with the API continuous score as the criterion variable and one with the PSDM continuous score as the criterion variable, using identical predictor variables: sex, race, age, education, TIP, DOSPERT+M, DIGS-S, and the health composite score. All required regression assumptions were met for both models. The test for independent errors for the API and the PSDM resulted in Durbin–Watson statistics of 2.26 and 2.03, respectively, indicating that there is no likely cause for concern. The Variance Inflation Factor (VIF) values, with an average value of 1.28 for both models, and the tolerance statistics, with all values greater than .64, indicate that multicollinearity is not an issue for either hierarchical regression model. Additionally, P-P plots of the standardized residuals demonstrate that errors are normally distributed, and scatterplots of the residuals and the criterion variables demonstrate homoscedasticity.

For both hierarchical regressions, the demographic variables were entered into the first step of the model, followed by the remaining variables in step 2. Both models were significant, yet not consistent with one another (see Table 2).

Demographic variables were significant predictors for the API, but not for the PSDM. Sex was a significant predictor, as women desired more autonomy ($M = 19.57$; $SD = 5.25$) than men ($M = 22.34$, $SD = 4.21$; $t(192) = 7.08$, $p < .001$), and there was an omnibus effect of race ($F(5, 188) = 14.72$, $p < .001$) and education ($F(3, 189) = 8.0$, $p < .001$). Follow-up *t*-tests show a higher desire for decision control among White participants ($M = 18.27$, $SD = 4.75$) than either Black

Table 2. Hierarchical regressions for the API and PSDM.

Model 1: API	Standardized β (significance)	Regression statistics
Step 1	**−.18 ($p<.01$)**	$R^2=.32$, $F(4, 174)=20.18$ ($p<.001$)
Sex	−.08 (n.s.)	
Age	**.39 ($p<.001$)**	
Race	**.17 ($p<.01$)**	
Education		
Step 2	**−.21 ($p<.001$)**	$R^2=.40$, $F(8, 170)=5.56$ ($p<.001$)
Sex	−.10 (n.s.)	
Age	**.39 ($p<.001$)**	
Race	**.13 ($p<.05$)**	
Education	**.26 ($p<.001$)**	
TIP	−.10 (n.s.)	
DOSPERT	.06 (n.s.)	
DIGS-S	.01 (n.s.)	
Health composite		
Model 1: PSDM	**Standardized β (significance)**	**Regression statistics**
Step 1	.05 (n.s.)	$R^2=.02$, $F(4, 177)=.89$ (n.s.)
Sex	−.10 (n.s.)	
Age	.08 (n.s.)	
Race	.01 (n.s.)	
Education		
Step 2		$R^2=.27$, $F(8, 173)=7.83$ ($p<.001$)
Sex	.10 (n.s.)	
Age	−.05 (n.s.)	
Race	−.01 (n.s.)	
Education	.03 (n.s.)	
TIP	**−.26 ($p<.001$)**	
DOSPERT	**.27 ($p<.001$)**	
DIGS-S	**.17 ($p<.05$)**	
Health composite	.02 (n.s.)	

API: Autonomy Preference Index; PSDM: Problem-Solving Decision-Making scale; TIP: Trust in Physicians; DOSPERT: Domain-Specific Risk-Taking scale; DIGS-S: Diagnostic Interview for Gambling Severity-Screen; n.s.: not significant, $p>.05$.

($M=21.33$, $SD=4.81$; $t(95)=2.09$, $p<.05$) or Asian participants ($M=23.67$, $SD=3.56$; $t(173)=8.54$, $p<.001$). While no significant mean differences were found for participants with advanced degrees (PhD or Masters), those with a bachelor's degree ($M=21.70$, $SD=4.61$) desired *less* input than those with a high school degree ($M=18.79$; $SD=4.70$, $t(142)=3.72$, $p<.001$). As Table 2 shows, the DOSPERT+M and DIGS-S were significant predictors for the PSDM, but not for the API, and the TIP was a predictor for both the PSDM and API.

Discussion

The aim of this study was to explore the relationship between demographic variables, trust in physicians, risk-taking, and gambling behaviors as predictors of medical decision-making. It was essential to confirm the relationship between gambling, risk-taking, and health in order to establish the importance of exploring these variables with regard to their influence on desired autonomy in medical decision-making. There were significant relationships found between gambling and certain health factors, including the health composite score and the amount of work-related physical activity. However, this study did not find certain expected correlations between gambling and other health-related variables, including BMI, general physical activity, TV and computer use, or alcohol and tobacco use, despite previous support for these relationships. The lack of a relationship between the substance use and gambling might be attributable to the low number of participants endorsing each behavior or the measurement method, as most previous studies use measures of substance dependence while this study focused on the frequency of use.

The lack of a relationship between general physical activity and gambling is possibly due to lack of variability in responses, as nearly 70 percent of the current sample indicated that they do not engage in *any* physical activity during an average week, thereby resulting in a floor effect. Bivariate correlations reveal that there is a relationship between gambling and desired autonomy, but while the

relationship was only trending with the API and did not reach significance in the regression model, the relationship was much stronger and significant with the PSDM. The same pattern is apparent for risk-taking, as measured by the DOSPERT+M.

Based on previous literature, it was hypothesized that more autonomy would be desired among women, younger participants, highly educated participants, and those who exhibit a low trust in physicians, while less autonomy would be desired among Black participants. The demographic characteristics of sex, race, and education were significant predictors for the outcome of the API, while they were inconsequential and insignificant predictors of the PSDM. Specifically, in support of the hypotheses, women desired more input and Black participants desired less input than White participants. However, results should be interpreted with caution due to the small number of Black participants. Additionally, Asian participants desired the least amount of input, even when compared with Black participants, which upon further investigation is consistent with previous research showing that individuals of certain Asian ethnicities prefer the doctor to have the greatest amount of decision contribution (Kenealy et al., 2011).

Age was anticipated to have an effect on the amount of autonomy participants desired, such that younger adults desired more autonomy, but no significant relationship existed. The current sample had a good age range (20–74 years); however, 75 percent of the sample was younger than 40 years, with a mean age around 33 years. The ability to detect a relationship between age and desired autonomy might be limited by this fact. Finally, despite predictions, education was not related to the PSDM and was inversely related to autonomy for the API, with those having only a high school education or GED desiring the most input in medical decision-making. Although this result is inconsistent with previous research, it is possible that the less-educated participants in this sample might erroneously believe that they have the ability to make personal health choices beyond the abilities of healthcare professionals, but these speculations cannot be substantiated without further investigation. Additionally, although not specifically tested in this study, those with less education are also likely to have lower income. This could be a motivating factor to be more involved in medical decisions because lower income patients are likely to want to avoid high-cost treatments and medications.

Because trust in physicians heavily influences desired autonomy, it is not surprising that this was the only shared predictor between the API and the PSDM. At first glance, the inconsistent results between the API and PSDM appear to be perplexing, but these results are actually quite compelling and informative. As it has previously been stated, variations among measures of patient decision-making and framing effects could partially be responsible for the resulting responses (Chewning et al., 2012), and the current findings allow for some insight into these variations. While both measures were designed to assess patients' desired autonomy in medical scenarios using a 5-point Likert scale, the API and the PSDM versions used for this study have two important differences, which could account for the disparate findings. First, the API uses very impersonal language ("the patient"), while the PSDM uses second-person language ("you"), which makes the scenarios feel more specific to each individual participant. Additionally, the API asks about "general health-related issues," which creates a rather ambiguous medical situation with no specific scenario to consider. On the other hand, the version of the PSDM given in this study tells participants to consider what decisions they would make in a very specific, and more life-threatening, scenario: having mild chest pains for 3 days.

Based on the differences in regression analyses for these two measures, it appears as though demographic characteristics play an important role when making general medical decisions for others, while risk-taking and gambling involvement play a vital role when making serious medical decisions for the self. Interestingly, it is these latter situations that are most relevant to real life and therefore warrant the most attention and also, as previously established, are the ones in which patients *typically* prefer to have less control (Deber et al., 2007; Ende et al., 1989). Interestingly, patients who suffer from certain mental health ailments have been shown to be difficult to engage in the treatment and recovery process, especially when the patient presents with comorbid addictions (Dixon et al., 2016). However, the current sample suggests that the opposite might be true for gamblers—greater desire for engagement or autonomy—especially for serious medical decisions when they should preferably defer to their healthcare provider.

This is an incredibly important finding, given the already established association between gambling and poor physical and mental health, especially in older individuals. More serious health conditions are known to develop as individuals' age, regardless of gambling involvement, but the relationship between aging and declining physical health may be exacerbated in gambling populations. A systematic review of the prevalence of gambling disorders in older populations reflects that rates vary widely from place to place and are largely influenced by sample differences, such as cultural norms and gambling accessibility or methodological differences, such as the type of gambling assessments used. However, some studies report rates of lifetime gambling disorder as high as 10 percent in adults aged older than 60 years (Subramaniam et al., 2015). If older individuals who gamble are more likely to have poorer health and are also more likely to want autonomy in medical decisions, the consequences could be detrimental. As presented by prior research, those patients who might have questionable decision-making strategies, which certainly include gamblers, should likely have less autonomy. However, engaging in a more SDM process where the patient and practitioner

work toward relational autonomy and a "shared mind" (Epstein and Street, 2011) could help to build the trust between gamblers and physicians. As has been noted, the communication process in SDM could potentially be more important than the decision itself (Dixon et al., 2016).

It should be noted that while these findings help to establish the association between gambling, risk-taking, and desired autonomy in medical decision-making, this study did not utilize an experimental design and therefore causality still cannot be asserted. While the findings might shed some additional light on the previous temporal ambiguity of the association between gambling behaviors and health—perhaps, the greater desire for autonomy and less trust in physicians contribute to the poorer health of gambling populations—based on the current findings, we cannot say that gambling behaviors cause poor health or cause the increased desire for autonomy. Because of the nature of these variables, it is infeasible to manipulate them in such a way to establish causality, and as such, the use of regression analyses and longitudinal designs are essential in order to establish pattern and parsimony in this area.

This study has a few notable strengths. First, the well-educated sample allows us to be confident in the participants' comprehension of questionnaire content and subsequent responses. Second, the use of multiple questionnaires related to medical decision-making (the PSDM and the API) allows us to make comparisons across the measures using the same sample of participants, which has previously not be reported and recognizes the importance of (1) wording choices and (2) scenario severity for patient/participant responses.

Study limitations include the lack of representation of Black and less-educated participants (everyone reported at least at high school education) as well as too few participants over the age of 40 years. These specific limitations might prove to be important, as the previous literature does show a connection between race, education, and factors related to health and medical care. Specifically, Black and less-educated individuals typically report having less trust in physicians and having poorer physical health overall. Furthermore, race, education, and age are common demographic correlates of gambling behaviors (Petry, 2004). Due to these potential relationships, it is important for the current findings to be cross-validated in a sample with better representation of these specific demographics. Additionally, while the current sample and methodology allowed for significant relationships to be revealed among gambling behaviors, health, and medical decision-making, the small number of those presenting with disordered gambling (defined as having a score of 5 or higher on the DIGS-S) prevented more complex between-group statistical analyses based upon gambling severity to be conducted.

Finally, while the Amazon's MTurk system is a popular and seemingly reliable form of data collection with numerous benefits (e.g. quick collection of data from a diverse sample), the online survey process has disadvantages as well. Because the participants are completing the survey outside of a lab setting, there is no way for the researchers to control the environmental context that could influence participant responses. Additionally, while the lack of face-to-face contact with the participants limits the influence of any experimenter bias, it perhaps also limits the amount of duty participants feel they have to the researchers and the research process, which could lead to lower quality data. However, all participants in this study met the 70 percent approval rating, indicating that they tend to give sufficient effort and quality responses during the survey completion process.

The current researchers hope to further investigate the connection between gambling, health, and medical decision-making using stratified sampling in order to obtain a larger proportion of participants who have more frequent and/or severe gambling behaviors. Specifically, while we have now established a foundational relationship between these variables, it is important to see how gambling status might be an influential component of the various treatment options that individuals choose, which ultimately vary in the amount of associated risk and benefit, depending upon the associated base rate of illness and the years of life lost or gained due to treatment choices.

In conclusion, this study reveals that the amount of autonomy participants desire in medical scenarios is not only influenced by previously supported factors, including demographic characteristics (sex, race, and education) and the amount of trust in physicians, but is also influenced by risk-taking and gambling activities, specifically when the medical scenario is in regards to the self and potentially life-threatening. The relationship between gambling and the desire for autonomy is one that is consistent with previous literature regarding the illusion of control in gambling settings, but this study's results indicate this desire for control could have a much more substantial impact on the health and well-being of those who gamble. Being involved with medical decisions can result in better quality of life later on (Hack et al., 2006), but having too much autonomy in situations that require greater medical knowledge and expertise could also lead to poor treatment choices and health outcomes. Furthermore, this desire for autonomy might also result in individuals failing to seek out preventative care when needed, which has momentous implications for the individual, as well as society as a whole.

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