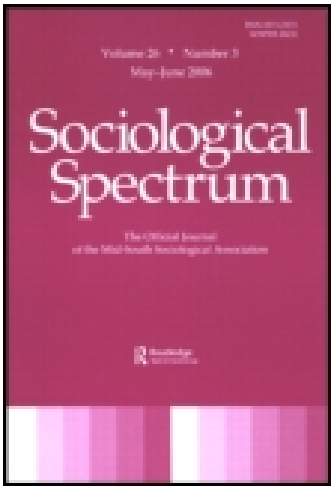

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Income Inequality and Gambling: A Panel Study in the United States (1980-1997)

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While there are many studies that examine the consequences of increasing income inequality, its effects on gambling behavior have not yet been studied. In this article, we argue that income inequality increases the average expenditure on gambling. Using longitudinal state-level data for the United States (1980–1997), we estimate fixed-effects models to analyze two types of gambling expenditure: pari-mutuel betting and lottery spending. Our findings show a positive effect of increasing income inequality on lottery expenditure. For pari-mutuel betting, the result is not linear, as for higher levels of income inequality, the positive effect decreases, suggesting that the effect flattens out when the increase in income inequality is highest. We argue that there are three reasons why we find a positive effect of income inequality of gambling expenditure: increasing mobility aspirations, availability of resources in the upper part of the distribution, and status anxiety in the lower part of the distribution.

The Lottery, with its weekly pay-out of enormous prizes, was the one public event to which the proles paid serious attention. It was probable that there were some millions of proles for whom the Lottery was the principal if not the only reason for remaining alive. It was their delight, their folly, their anodyne, their intellectual stimulant. Where the Lottery was concerned, even people who could barely read and write seemed capable of intricate calculations and staggering feats of memory.

George Orwell, 1984

INTRODUCTION

Research on the impact of inequality is rapidly expanding. Rising income inequality has been linked to a wide range of undesirable societal outcomes, including behavior that can be seen

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as risk taking, such as, for example, smoking or alcohol usage (e.g., Wilkinson and Pickett 2009). Surprisingly, one of the most widespread risk-taking behaviors, gambling, has not been studied in relation with increasing income inequality. In this article, we argue that rising income inequality serves as an explanation for increased risk-taking behavior and, more specifically, for gambling expenditure.

The majority of research on gambling behavior in the social sciences has predominantly focused on problematic (and pathological) gambling (e.g., Johansson et al. 2009; McNeilly and Burke 2002; Volberg and Wray 2007). Many researchers seek explanations for gambling in the psyche by, for example, studying to what extent people gamble out of excitement (e.g., Anderson and Brown 1984) and to what extent their decisions in gambling are cognitive (Sharpe and Tarrier 1993; Rogers 1998).

However, gambling behavior is also a more general social phenomenon that has been largely neglected as such in social scientific research (see also Volberg and Wray 2007). While previous work analyzes which social groups are more likely to gamble (e.g., McEffery 1994; Sproston, Erens, and Orford 2000; Beckert and Lutter 2009, 2012), contextual explanations for these differences are often not considered. Overall, gambling behavior is scarcely studied in relation to macro conditions (but see Freund and Morris [2005, 2006], who argue that income inequality is increased by gambling due to income concentration). A more sociological perspective on gambling behavior that seeks for its societal explanations can help to better understand how gambling comes about.

We argue that income inequality is likely to increase gambling expenditure through three mechanisms. Firstly, higher income inequality makes upward social mobility for individuals in the lower part of the income distribution more desirable. Consequently, as a strategy to get ahead in society, people gamble more. Secondly, in more unequal societies, the upper part of the distribution has more resources to gamble. Put differently, under conditions of high inequality, resources are more concentrated in the upper part of the distribution. As a result, people in the top of the distribution can spend more and will do so in the form of gambling because it confirms their status as 'winners' in society. Thirdly, inequality leads to more anxiety and stress amongst the poor (Wilkinson and Pickett 2009), which increases gambling behavior as relief in the lower part of the distribution. Based on these three arguments, we hypothesize that income inequality increases gambling expenditure.

We test this hypothesis empirically by analyzing longitudinal state-level data containing both income inequality and gambling expenditure in the United States for 36 states in the period of 1980–1997. We relate income inequality at t-1 in each state to the per capita expenditure for two types of gambling: lottery playing and pari-mutuel betting.[1] We contribute to the existing literature by proposing and testing a broader, more sociological account of gambling, which adds to the rapidly expanding literature on the consequences of income inequality (e.g,. Andersen and Fetner 2008; Huisman and Oldehinkel 2009; Uslaner and Brown 2005; Wilkinson and Pickett 2009). The empirical contribution of this study is the use of longitudinal data to examine consequences of inequality. Studies that examine the effect of inequality often rely on cross-sectional data, making reversed causality and bias due to unobserved heterogeneity more likely.

[1]Pari-mutuel betting is a betting system that places all bets in a prize pool without a priori providing odds to the contestants. This prize pool is eventually shared between all correct bets, proportional to their contribution to the prize pool. A notable example of this system is the betting that occurs on greyhound racing.

The longitudinal models that we estimate support the hypothesis that increasing income inequality is positively related to gambling expenditure. This finding is in line with the more general claim, advocated by Wilson and Pickett (2009), that income inequality enhances risk-taking behavior.

THEORY AND HYPOTHESIS

Gambling as Risk-Taking Behavior

Despite the stereotypical stigma that is often placed on gambling, it is a widespread phenomenon. For example, in the United States, 82% of adults report to gamble at least once a year (Welte et al. 2002). Several studies show that the vast majority of these gamblers are not categorized as problematic: the prevalence rate for excessive gambling (both problematic and pathological) is around 3% (for an overview see Stucki and Rihs-Middel 2007). The high participation rates in gambling activities make it an interesting research object for sociologists. Moreover, gambling is a clear example of a fundamental interest of sociologists: risk taking (Frey and Eadington 1984:121; Cosgrave 2008). The concept of risk has often been studied (Beck 1992; Giddens 1991), and scholars increasingly point to risk taking as desirable behavior. Lyng (1990), for example, describes the increase in interest in voluntary risk-taking behavior with the concept of edgework: behavior that involves a ''threat to one's physical or mental well-being or one's sense of an ordered existence'' (Lyng 1990:857). The goal of this risk-taking behavior is the excitement of taking the risk. The stereotypical example of edgework is extreme sports, where failure results in death. Gambling, however, is also behavior where an in essence unnecessary risk is taken: to wager large amounts of money is voluntary risk taking as a form of leisure.

Gambling has been associated with risk-taking behavior before. Clotfelter and Cook (1989) argue that gambling can be seen as a good proxy for risk-taking behavior. Brown, and colleagues (2010) study the United Kingdom and connect gambling expenditure to financial risk taking such as loans, hire purchase agreements, and credit club payments. There are, however, also good reasons to see gambling not so much as risk-taking behavior. Buying a lottery ticket, for example, is a relatively low investment, thereby having a relatively low risk (e.g., McEffery 1994). Still, we argue that this does not make gambling risk-free behavior: not gambling is always more risk-averse than gambling, and the risk increases with the amount (proportional of income) that is wagered.[2]

In this article, we distinguish two types of risk-taking behavior: risk taking as a form of leisure and risk taking as a means to social mobility. Layton and Worthington (1999) find that individuals with higher incomes spend more on gambling, thereby supporting the claim that there is indeed more gambling at the top of the income distribution. Gambling by people in the top of the distribution is therefore more likely to be risk-taking behavior as leisure and as a status symbol: because high-income individuals are already in the top of the distribution, they cannot rise much more.

[2]In our empirical study we focus on the expenditure on gambling, which validates gambling as a risk-taking process. The higher the amount that is wagered (net of the wealth of a state), the higher the risk.

At the bottom part of the income distribution, gambling can be motivated both by relief or escapism (risk taking as a form of leisure), as well as the prospect of upward social mobility (risk taking as a means to social mobility). People gamble as a way of potentially improving their societal position, for example by winning the lottery (Rogers 1998). However, in doing so they must be willing to accept different levels of risks. For example, according to Young (2010), the risk society produces a corollary, a demand for risk in the form of gambling. To get ahead in society individuals increasingly are taking risks.

Previous work using individual level data finds that lower-class individuals indeed have a higher probability to engage in gambling (Brown et al. 2010:23, Lang and Omori 2009; Beckert and Lutter 2012). Layton and Worthington (1999) confirm these findings by showing that in Australia blue-collar workers gamble more than white-collar workers. Besides the frequency of gambling, there is also evidence that gambling expenditure is unevenly distributed across the income distribution, low incomes spending relatively more than high incomes. In a study of lottery play in the United States, Clottfelter and colleagues (1999) show not only that participation in the lottery is frequent under lower income groups (48.5% of the people earning less than $10,000 per year and 46.7% of the people earning between $10,000 and $25,000 a year), but also that spending on the lottery is relatively high among those groups (respectively $597 and $569 per year). This means that the lower income groups outspend the higher income groups both in relative and in absolute terms.

However, such high gambling expenditure by the lower income population comes at a cost. Kearney (2005) shows that after the introduction of a state lottery, lower income people significantly cut down expenditure on food (2.8%) and on home mortgage, rent, and other bills (5.8%) to compensate for their gambling expenditure. Lang and Omori (2009) show that the least wealthy are more likely to lose a higher proportion of their income than wealthier households. While there is previous work on who gambles, and how much different groups spent on gambling, we know relatively little about how the shape of the income distribution affects gambling.

Income Inequality and Gambling

Research that analyzes the consequences of inequality is growing steadily. Outcomes such as crime, bad health, low social trust, and low levels of civic participation are seen as being dependent on the income inequality in a society (Uslaner and Brown 2005; Kawachi et al. 1997; Daly, Wilson, and Vasdev 2001; Huisman and Oldehinkel 2009; Kelly 2000;Wilkinson and Pickett 2009; Rothstein and Uslaner 2005; Solt 2008; Lancee and Van de Werfhorst 2012). While these studies connect income inequality to risk-taking behavior, Neckerman and Torche (2007) argue that individuals are more likely to be risk averse in contexts with a high level of income inequality, as the cost of failure is higher. However, no empirical evidence exists to support the statement. We discuss three mechanisms by which income inequality is likely to increase gambling expenditure, and with that, implicitly, increases risk-taking behavior.

Firstly, rising income inequality makes upward social mobility more beneficial. Wilkinson and Pickett state that ''the scale of income differences has a powerful effect on how we relate to each other'' (2009:5). They argue that, with higher inequality, there are more status differences between individuals which results in larger status gaps. These gaps trigger status competition. According to Wilson and Daly (1985), especially men take risks in order to achieve social

reputation or status. Already in 1951, Bloch (1951:215) argued that the ''chance element in human life is particularly exploited in those societies where status is largely competitive.'' Studies indeed show that individuals are more likely to gamble in contexts where they perceive their own income as low (Haisley et al. 2008). Along this line of reasoning, as growing inequality fuels aspirations for upward mobility, inequality is likely to trigger gambling behavior. Using data from the United States, Xu and Garand (2010) show that especially low-income individuals residing in states with high income inequality are more likely to perceive large increases in income inequality.

Mobility aspirations based on material motivations especially hold for people in the bottom half of the income distribution. As Clotfelter and Cook (1989) argue, gambling is a way out for those that cannot afford otherwise. They state that the ''opportunity to purchase a chance to win 500 dollars for one dollar seems attractive to those that do not have other ways of obtaining that much spending money'' (Clotfelter and Cook 1989:71). On the basis of a Swedish study of soccer betting, Frey and Eadington (1984:114) argue that ''the propensity to gamble is not necessarily determined by social class characteristics, but rather by the extent to which upward mobility aspirations are held.'' Under conditions of high inequality, the distance to the top is larger, hence the potential gain of upward mobility is higher.[3] We therefore expect that since rising inequality increases the potential gains of gambling, it will also increase the incidence of gambling as a ways of achieving upward mobility, specifically in the lower and middle part of the distribution. As a consequence, we expect gambling expenditure to rise.

A second mechanism that explains how rising income inequality increases gambling behavior is the changing composition of the income distribution. In more unequal societies, the top of the distribution by definition has more resources to gamble and thus expenditure is likely to be higher. Indeed, gambling expenditure is found to increase with income (Welte et al. 2002). The reason that people gamble more is that for individuals in the middle and upper part of the income distribution, gambling is a leisure activity and serves as a status symbol confirming and emphasizing people's position on the societal ladder. Put differently, as a result of status competition, people in the upper part of the distribution claim their position as 'winners' in society by engaging in gambling activities. In more unequal societies, we therefore expect that people in the upper part of the distribution gamble more because of leisure or as a status symbol.

The third argument that stipulates a positive relationship between income inequality and gambling expenditure is increasing envy and stress in the lower part of the distribution (Eitle and Taylor 2011; Wiggins et al. 2010). The ''frustration'' argument was first introduced by Devereux, who argued that gambling is a ''safety valve through which the repressed wishes crowd for escape'' (1980 [1949]:781). As Devereux argues, particularly people in the bottom part of the income distribution tend to be frustrated. For them, higher inequality results in increasing levels of frustration, since those at the bottom are lagging behind and simultaneously see that another part of the population grows ever richer (Wilkinson & Pickett 2009). Already in 1984, Frey and Eadington (1984:110) conclude: ''In sum, gambling is a mechanism of accommodation utilized by society to channel protestations resulting from frustration with the basic economic and ethical systems in a socially approved- that is, functionally imperative-manner.''

[3]Note that we do not argue that gambling is the *only* strategy to achieve upward mobility. There are many ways through which this can be achieved. We argue that upward mobility aspirations is one of the reasons that people gamble, even under lower levels of income inequality.

More recently, Beckert and Lutter provided micro-level evidence for the relation between frustration and gambling behavior. Using micro data from Germany they find that status frustration is one of the main factors contributing to an individual's gambling (lottery) expenditure (2012:13).

In a situation of economic stratification the lower part of the income distribution feels degraded and desires the resources they lack even more (Blau and Blau 1982). Uslaner and Brown (2005; Rothstein and Uslaner 2005), examine the relation between inequality and people's civic engagement. They argue that under conditions of high inequality, people will perceive that their views are not represented in the political system. As a consequence, people may feel powerless and they will opt out of civic engagement. These feelings of frustration may also manifest itself in increasing gambling behavior as a form of escapism (Cohen 2001).

The three mechanisms that we identify are not expected to explain the expenditure of lottery playing and pari-mutuel betting equally (King 1985). The argument of mobility aspiration is likely to apply mainly for lottery playing, as a small wager can give high returns. With only a small investment, people have the chance to take a large step on the income ladder. In contrast, the status and leisure mechanism is likely to apply mostly to pari-mutuel betting, because it is a more visible form of gambling. The anxiety and frustration argument can apply to expenditure on both types of gambling. When individuals feel detached from society, they can engage in all forms of risk-taking behavior.

Unfortunately, empirically, we are not able to distinguish between the three mechanisms because we do not have data on gambling expenditure in different parts of the distribution. However, all three mechanisms predict a positive effect of income inequality on gambling expenditure. Our general hypothesis to be tested is therefore that with an increase in income inequality the average gambling expenditure increases as well.

DATA AND MEASUREMENT

We test our hypothesis using data from the Gambling Impact and Behavior Study (GIBS) carried out in the years 1980–1997 by the National Opinion Research Center at the University of Chicago, for the National Gambling Impact Study Commission (see NORC, 1999). In this survey, information is gathered on per capita gambling expenditure for four types of gambling: bingo, lottery, pari-mutuel betting, and casino. In the GIBS survey, data for per capita lottery expenditure are gathered at the state level. Pari-mutuel expenditure per capita is, however, gathered at the level of census designated places (CDPs). A place is defined by the U.S. Census Bureau as ''densely settled concentrations of population that are identifiable by name, but are not legally incorporated places.'' Out of a population of 32,000 CDPs 105 were selected by using a simple stratified sampling method. The focus in our study is not on the level of CDPs, but on the level of states. For pari-mutuel spending we therefore calculate the state-level per capita spending as an average of all CPDs that are surveyed in that state.

We do not analyze the data of casino expenditure as casino gambling is highly conditioned on the availability of casinos nearby. Unsurprisingly, a casino industry survey shows that in 1992 (about the midpoint of the GIBS survey) Nevada and Atlantic City, where casinos are legal, account for the large chunk of casino visits. Out of about 50 million total visits to the casino, more than 40 million took place in those two states. As legal restrictions to casinos influence

the availability of casinos, it hence does not make sense to explain gambling behavior on the basis of income inequality in states. We also exclude bingo expenditure because the majority of observations in the GIBS survey are extrapolated instead of observed.

Measures

Data for per capita pari-mutuel expenditure were harmonized on the basis of various receipt data sources. Per capita lottery expenditure is estimated on the basis of lottery sales and prize data for the time period 1980 until 1992 and based on state lottery agency data for the remaining period of 1992 to 1997.[4]

We measure income inequality with the Gini-coefficient. The Gini-coefficient has a theoretical range from zero, indicating that all households have an equal share of income, to 100, indicating that one household receives all income. The Gini-coefficient is an attractive measure of income inequality, because it calculates overall inequality: it captures the income distances of 'everybody to everyone.' We use data from the University of Texas Inequality Project (2011).[5] The state level Gini-coefficient is available for all states and years. While our hypothesis predicts a positive relation between income inequality and gambling, we do not presume that this effect is linear. To account for possible non-linearity we therefore add a squared term.

We control for general wealth in each state by including yearly measures of per capita Gross State Product (GSP). For 1977 to 1990, we use the GSP measures by Beemiller and Dunbar (1993). For the remaining years, we rely on Beemiller and Woodruff (2003). To obtain the GSP per capita, we divide it by the state population size (derived from the U.S. Census Bureau). Descriptive statistics on all variables are displayed in Table 1. Furthermore, in models that we do not show we controlled our results for the introduction of state lotteries (cf. Lutter 2011). The inclusion of this variable did not alter our results.

Method of Estimation

We estimate fixed effects regression models. The fixed effects (FE) model estimates an intercept for each state. The FE model uses each variable's difference from its within-state mean and hence can estimate only coefficients that have within-state variation (Rabe-Hesketh and Skrondal 2008). The advantage of the FE model is that it controls for all differences between states, thereby eliminating time-constant unobserved heterogeneity (Halaby 2004). Due to the FE set-up, we focus on over-time variation within states and therefore do not need covariates to control for enduring differences between states. To better account for potential reversed causality, we include our measure of inequality lagged one year.[6] Finally, we add year dummies, to control for a general time trend.

[4]We included a dummy variable to account for potential differences that arise out of the different coding of lottery expenditure (a ''post 1992'' dummy). The inclusion of this dummy (tables not shown, available from corresponding author upon request) did not alter our results. For more information on the measurement of the dependent variables see the codebook of the Gambling Impact and Behaviour Study (NORC, 1999:13-15).

[5]See Galbraith and Hale (2008) for the composition of this measure.

[6]We also estimated models without and with longer time-lags. The results are consistent with the ones reported in the next section.

TABLE 1
Descriptive Statistics

	Observations	Mean	*SD*	Min.	Max.
Per capita lottery expenditure	334	43.47	28.49	2.72	145.42
Gini coefficient (t-1)	334	0.39	0.02	0.33	0.46
Gini squared (t-1)	334	0.15	0.02	0.11	0.21
GSP per capita (1,000 $)	334	21.25	5.69	8.91	37.37
Per capita pari-mutuel expenditure	514	12.18	11.17	0.03	49.46
Gini (t-1)	514	0.40	0.02	0.33	0.47
Gini squared (t-1)	514	0.16	0.02	0.11	0.22
GSP per capita (1,000 $)	514	20.25	6.20	8.70	40.24

Source: GIBS Survey 1980–1997, University of Texas Inequality Project (2011).

RESULTS

Figure 1 provides an overview of the temporal development of pari-mutuel and lotto expenditure (standardized to the range 0–1) along with the development of income inequality by state. Both forms of gambling show an increase in expenditure in almost all states, although there are differences. In Maine, for example, all two types of gambling increase at the same pace, while in Connecticut the differences between lottery and pari-mutuel betting are large. Overall, income

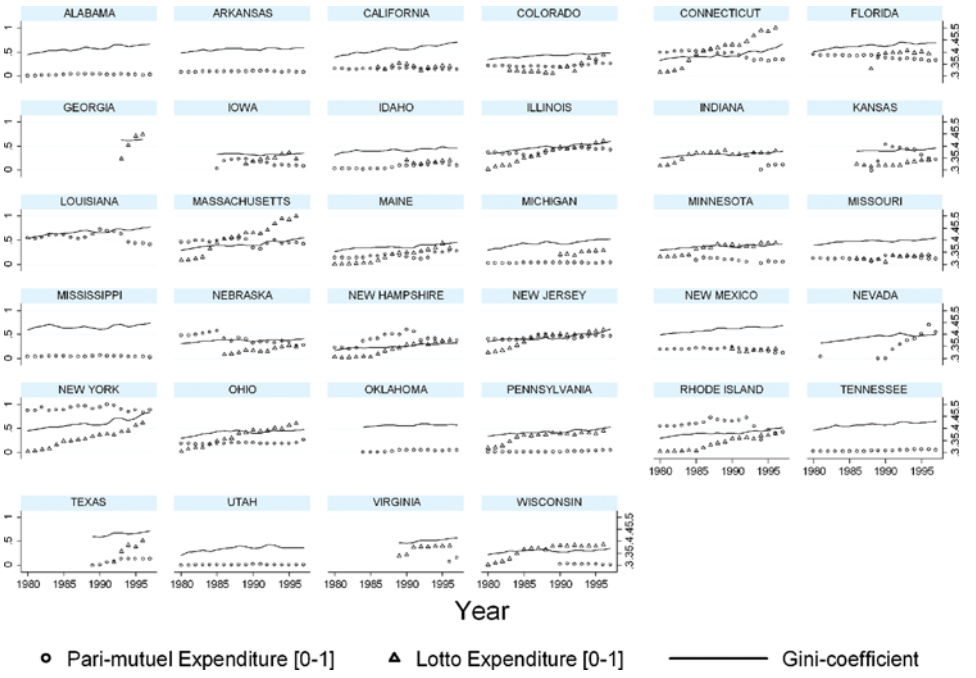

FIGURE 1 Over-time development of inequality and gambling expenditure, by U.S. states (color figure available online).

inequality, as well as gambling expenditure per capita, has risen between 1977 and 1996 in all states in our sample. Hence, this descriptive picture, at first inspection, supports our hypothesis.

Using fixed effects models, where years are nested in states, we estimate the effect of income inequality on gambling expenditure. Table 2 shows the results when predicting per capita pari-mutuel expenditure. Model 1 only includes income inequality (at t-1), which is not statistically significant. If we, however, account for non-linearity, by adding a squared term, we find a significant positive effect of income inequality, and a significant negative effect of squared income inequality. Substantively, this implies that higher income inequality leads to more spending on pari-mutuel betting, but this positive effect is flattened down for higher values of income inequality. The coefficients remain statistically significant once we control for GSP per capita (which increased in almost all states in each year). Furthermore, even in the most restrictive model, where we control for the general over-time increase in pari-mutuel betting by adding year dummies, the effects remain significant. In the final model the explained variance is low, although this might be caused because the measure is aggregated from lower level units to states.

Figure 2 graphically displays these findings. In this figure, for each state the predicted values of pari-mutuel expenditure, based on the final model, are plotted against levels of income inequality. For most cases, high values of income inequality are associated with high pari-mutuel spending. However, for the highest values of income inequality, the positive effect flattens down and even becomes negative for a few cases.

There are two reasons that might explain why the effect of income inequality is indeed non-linear. First, there is only a certain amount of gambling that people in the upper part of the distribution can do. In highly unequal societies the gambling expenditure is therefore unlikely to rise even more. Furthermore, one could argue that for the wealthiest, other forms of behavior can provide the status symbolism and leisure that is generated by gambling. Investing in the stock market could take over the role of gambling (both in terms of status symbolism as well as leisure). Secondly, when a society is very unequal, the bottom income group

TABLE 2
Fixed-Effects Regression Predicting Per Capita Pari-mutuel Expenditure in U.S. States (1980–1997)

	Model 1		Model 2		Model 3		Model 4	
	b	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*
Gini-coefficient	5.156	(12.724)	775.917***	(224.513)	790.496**	(233.175)	620.676*	(271.666)
Gini-coefficient squared			−975.176***	(283.609)	−987.6562**	(288.835)	−799.291*	(326.572)
GSP per capita (1,000 $)					−.012	(.051)	−.057	(.123)
Year dummies							yes	
Constant	10.202*	(4.999)	−141.520**	(44.401)	−145.072	(46.955)	−106.279	(56.075)
n Observations	514		514		514		514	
n States	33		33		33		33	
Within R^2	.000		.024		.025		.044	
Overall R^2	.003		.007		.009		.036	

Source: GIBS Survey 1980–1997, University of Texas Inequality Project (2011).
*$p < .05$; **$p < .01$; ***$p < .001$, two-tailed tests.

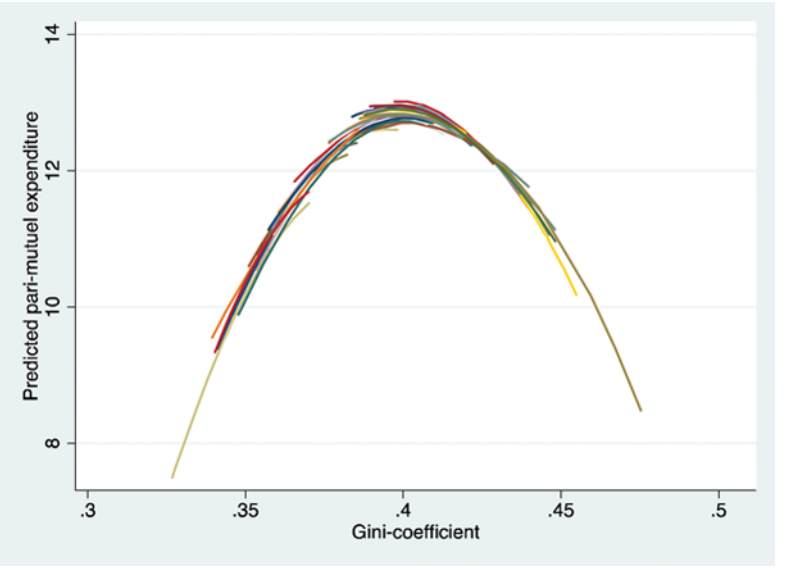

FIGURE 2 Predicted values of per capita pari-mutuel expenditure for each U.S. state (color figure available online).

might feel so marginalized that even their hopes of upward social mobility disappear. The disillusion of the gap might cause a cut-off point where inequality no longer affects gambling expenditure.

Table 3 presents the estimates for per capita lottery expenditure. In the case of lottery expenditure, we found no evidence for non-linearity in the effect of income inequality. The first model shows a positive effect of income inequality (at t-1), indicating that in states where inequality increased, expenditure on lottery also increased. This effect remains significant once

TABLE 3
Fixed-Effects Regression Predicting Per Capita Lottery Expenditure in U.S. States (1980–1997)

	Model 1		Model 2		Model 3	
	b	*SE*	*b*	*SE*	*b*	*SE*
Gini-coefficient	1834.053***	(78.235)	434.528***	(110.257)	427.441***	(143.355)
GSP per capita (1,000 $)			3.095***	(.205)	5.086	(.592)
Year dummies					yes	
Constant	−659.670***	(30.056)	−259.465***	(57.614)	−246.598	(55.243)
n Observations	334		334		334	
n States	26		26		26	
Within R^2	.642		.794		.825	
Overall R^2	.118		.438		.490	

Source: GIBS Survey 1980–1997, University of Texas Inequality Project (2011).
*$p < .05$; **$p < .01$; ***$p < .001$, two-tailed tests.

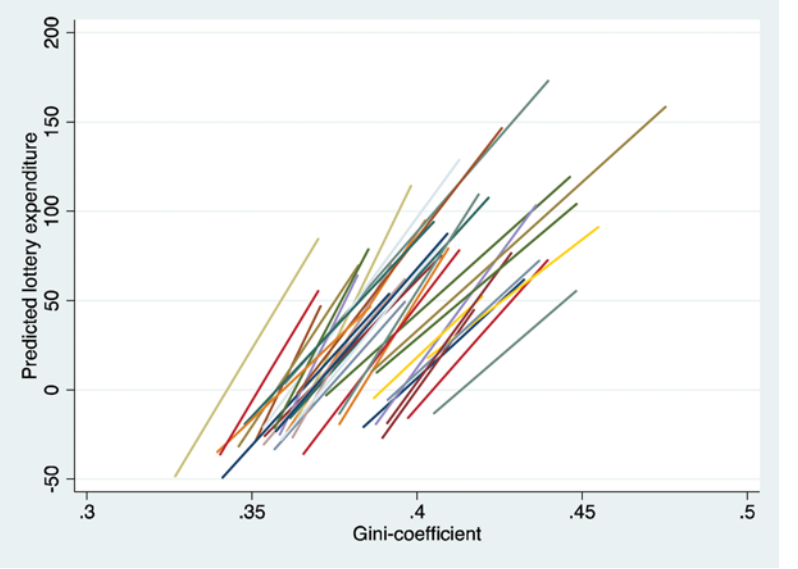

FIGURE 3 Predicted values of per capita lottery expenditure for each U.S. state (color figure available online).

we control for wealth by adding GSP per capita. Furthermore, the effect persists even when we control for a general time trend and increase of gambling, by adding year dummies. The explained variance of these models is relatively high. The final model explains about 83% of the observed variance in lottery spending within states. In Figure 3, the predicted values are presented for each state. The figure clearly shows that, both within and between states, higher income inequality corresponds with higher per capita lottery expenditure.

In sum, our findings support the theoretical prediction that income inequality positively affects gambling expenditure, although this effect is not linear for expenditure on pari-mutuel betting. Due to our fixed effects design, we control for all time-constant differences between states, eliminating the problem of bias due to (time-constant) unobserved heterogeneity. Furthermore we predict gambling expenditure with income inequality in the previous year, making reversed causality less likely.

CONCLUSION

In this study, we analyzed the effect of growing inequality on gambling expenditure in the United States with longitudinal data. We argued that inequality affects gambling behavior for three reasons. First, growing inequality is likely to increase spending on gambling activities because an increase in income inequality makes upward social mobility for the lower part of the income distribution more desirable. Gambling will therefore be used more often as a means to get ahead in society. Secondly, in more unequal societies the upper part of the distribution has more resources to gamble and will do so because of leisure and as a status symbol. Thirdly, inequality leads to more anxiety and stress, which in turn increases gambling as a relief in the lower part of the distribution.

We found empirical support for this hypothesis. Analyzing two different dependent variables, our findings indicate that increasing income inequality is positively related to gambling expenditure in U.S. states. For pari-mutuel betting, the effect is, however, not linear. The effect of inequality most likely flattens because of a natural maximum to gambling expenditure, as well as the unavailability of resources in the lowest part of the income distribution.

The results have to be seen in the light of some serious limitations. First of all, no (longitudinal) individual level data was available that could be matched to contextual information. It was therefore not possible to empirically examine the effect of inequality for people in different parts of the income distribution. Based on the current findings, we therefore know that inequality increases gambling expenditure, but we do not know who are the people that spend more. This implies that we could not empirically differentiate the theoretical arguments that we identified.

Second, because casino gambling is highly regionally concentrated in the United States, it was not possible to include it. Further research could focus on replicating the current findings in different and cross-national contexts, and for different forms of gambling, like casino-based gambling.

Finally, since our sample ranged from 1980 to 1997, internet gambling was of no influence to our results. As this recent technological development has made gambling more easily accessible for a large group, further research has to take it into account. The rise of internet gambling could of course have large effects on the relation between income inequality and gambling. It is highly accessible, and the potential revenues of internet gambling are relatively high. We are therefore likely to underestimate the relationship between income inequality and gambling expenditure: whereas income inequality increased over the past decade, we are likely to underestimate the overall gambling expenditure due to the absence of data on internet gambling.

Although we focus on gambling behavior, the results fit within the broader research agenda on the consequences of (increasing) income inequality. Specifically, gambling behavior can be seen as a proxy for being risk prone. To our knowledge, this is one of the first studies that examines a relation between income inequality and legal risk-taking behavior in a longitudinal perspective (but see Freund and Morris 2005, 2006). The findings suggest that differences in incomes might affect the degree of risk that people are willing to take. As such, the results may have implications for research on a number of societal outcomes that are related to risk taking as well as social mobility, such as (but not exclusively) entrepreneurship, investing, and crime.

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