The Influence of Online Gambling Environments on Self-Control

Jennifer Christie Siemens and Steven W. Kopp

Online gambling has become a fast growing but controversial industry. This article summarizes two studies that investigate characteristics of Internet gambling environments that lead to problems with self-control. In-depth interviews with both online and casino gamblers reveal that their experiences are categorized differently in an online context, causing some informants to undertake less monitoring of spending. They also use their physical environment to impose boundaries. Next, an experiment investigates two characteristics of online gambling environments: the use of intangible currency and rapid sequential choice. Both traits negatively affect people's ability to maintain an accurate, in-the-moment account balance across a sequence of gambles. These studies suggest several policy and consumer welfare implications.

Keywords: gambling, online gambling, public policy

For more than 200 years, Americans have weighed the entertainment value of gambling against the social ills that seem to accompany the practice. The origin of the Internet has thrust this debate into an online context (Quittner 1995). Conservative estimates suggest that online casinos and bookmakers brought in proceeds of over $15 billion worldwide in 2006, an amount expected to nearly double by 2012 (The Economist 2007). As much as 60% of these industry revenues come from U.S. participants (LaPlante 2007).

Internet gambling can be performed in almost all traditional manners. The most popular types of betting are online casinos and sports wagering, including nearly every game otherwise available in physical casinos. There are hundreds of online casinos and sportsbooks. However, the ease of access, combined with the moral stigma placed on gambling, have led to a myriad of international, federal, and state regulations seeking to control availability and access to these types of websites.

Previous studies and opinion have suggested that electronic mediated gambling, in video game and online formats, may be more harmful or dangerous to players than traditional casino gambling (King, Delfabbro, and Griffiths 2010; LaBrie et al. 2007; Smith and Campbell 2007). Concerns about the potential for consumer fraud (Miller 2006),

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compulsive behavior (Bernhard 2007; H.R. 2046 2007), and underage gambling (Griffiths and Wood 2000) point to the need for government regulation. In a recent study of 30 online and casino gamblers, Cotte and Latour (2009) found that consumption is less regulated in online environments; they thus speculate that gamblers may be attracted to online gambling because it represents a form of transgression. They also find that online gambling is easier to access and results in more time spent gambling, such that online gambling becomes integrated into everyday consumption, leading to "more mindless consumption of gambling and resultant losses" (Cotte and Latour 2009, p. 756).

Still, relatively little research has investigated how mental processes underlying participation in casino gambling may differ in a computer-mediated, virtual context. As the Internet continues to grow and online spending increases, it may be tempting simply to apply what has been learned in offline contexts to computer-mediated environments. This cross-contextual translation should be undertaken with skepticism, however, because research suggests that computer-mediated environments possess more distinct qualities than those of traditional face-to-face consumption environments (Hoffman and Novak 1996; Joinson 1998; Koyuncu and Bhattacharya 2004; Schlosser 2003). The Internet exacerbates the effects of certain behaviors because of its easy access and simple use (Branch 2002; Forman and Block 2006; Yellowlees and Marks 2007). Even in a gambling context, it thus has been a constant challenge to policy makers to ensure the sometimes contradictory goals of online safety and freedom (Miller 2006).

This article summarizes the results of studies that examine how unique characteristics of online gambling environments influence individual spending decisions and gambling experiences. We begin with a brief discussion of recent regulatory issues related to Internet gambling and then provide a description of two studies that investigate the

characteristics of Internet gambling environments that may lead to particular consumer vulnerabilities. Finally, we discuss the results and implications for policy makers.

Recent Regulatory Issues and Efforts

Governmental control of gambling, however defined, has deep roots (Eadington 2004; *Regional Review* 1991; Taylor and Kopp 1991; U.S. Government Accounting Office 2002). In the United States, gambling is generally illegal unless regulated by a state. Many states have succumbed to the temptation to gather revenues from lotteries (Blalock, Just and Simon 2007) and allow other types of gambling in specific geographic areas, such as Native American reservations or "offshore" commercial casinos constructed on lakes or rivers (Lauderdale and Thomas 2009). Because gambling is legal in more than 50 countries and jurisdictions, containment and prosecution has remained difficult in the United States. The Internet provides 24-hour, virtual access to hundreds of gambling facilities, in which consumers spend billions of dollars each year. The National Gambling Impact Study Commission thus predicts that "online wagering promises to revolutionize the way Americans gamble" (James 1999, p. 5-1).

Until very recently, federal regulation of gambling tended toward efforts to control interstate commerce, allowing individual states to decide what forms of gambling could take place within their borders. Initial regulation and prosecution of Internet gambling cases employed laws based on nineteenth- or twentieth-century technologies. Both the Interstate Wire Act (1961) and the Foreign Travel or Transportation and Aid of Racketeering Enterprise Act (18 U.S.C. § 1952) have been applied in Internet gambling cases (Watson et al. 2004). Significant limitations of these existing laws, in either interpretation or application, have led to Internet-specific legislation intended to curb online gambling, the first introduced in 1997 (S. 474; H.R. 2380). These and other early efforts were unsuccessful until the passage of the Unlawful Internet Gambling Enforcement Act of 2006 (UIGEA; 31 U.S.C. §§ 5361-5367), which went into effect June 1, 2010. The UIGEA does not prohibit online gambling per se but makes it illegal for U.S.-based financial transaction providers and electronic payment systems to accept, distribute, or otherwise honor Internet gambling–related transactions. Banks and other financial institutions are required to take initiatives to identify, code, and block the transfer of credit card payments earned by Internet gambling websites. The UIGEA had a negative impact on Internet gambling commerce in the United States, as many publicly owned, European-based online gambling sites stopped accepting bets from U.S. players.

Privately held websites located in the Caribbean and other areas remain out of the reach of U.S. law enforcement though and continue to take bets from U.S. gamblers (*The Economist* 2009; Sullivan 2007). Even within the United States, enforcement of the law is largely ineffective (Wijnholds and Little 2007), contains many loopholes (Wajda 2007), and violates international trade agreements (Peters 2010). Recent legislation would sanction the licensing, regulation, and taxation of domestic and offshore Internet gambling businesses and essentially repeal UIGEA (Di Gregory 2010; H.R. 2267).

This legislation also proposes unspecified mechanisms to protect consumers from overspending.

While U.S. Congressional hearings have been dealing with the balance between freedom and regulation (Duke 2007; Hanaway 2007), individual states have begun to consider legalizing and taxing online gambling. New Jersey, California, Florida, and Connecticut are among the states with active bills. Kentucky recently passed a bill in its state legislature that would allow taxing of online horse betting (Cypra 2010). Other states have tested prohibitions of online gambling in courts (*Rousso v. State of Washington* 2010). This ambiguity and less-than-systematic policy have kept the online gambling industry alive for U.S. customers.

The Internet has been referred to as "a parallel universe that mirrors the physical world in some ways but exhibits entirely unique properties in others" (Schwartz 1997, p. 1). We explore the characteristics of computer-mediated gambling environments and how they differ from traditional face-to-face contexts and discuss the results in application to current public policy issues. Are consumers any more likely to lose track of their money when Internet gambling? How does online gambling differ from casino gambling, and do these differences affect self-control? Literature on self-regulation and self-control suggests specific reasons self-control fails and how the context may affect this failure. Furthermore, mental accounting research helps explain the psychological processes underlying spending and choice, which have important implications for online gambling but also may be extended more generally to other online consumer behaviors.

Theoretical Framework

Self-Regulation and Self-Control

Baumeister (1994) defines self-control as the self's capacity to alter its own states and responses. There are three potential causes of self-control failure (Baumeister 1994; Baumeister and Mick 2002). First, to maintain self-control, a person must have standards, goals, or guidelines to help specify the appropriate behavior.

Second, people should engage in frequent monitoring to keep track of their own behavior. Even if a person sets a guideline, he or she must diligently evaluate behaviors against the goal. Baumeister (1994) argues that several issues might cause a monitoring lapse, all involving a loss of self-awareness. For example, monitoring tends to break down when people experience deindividuation, a phenomenon that arises when they are focused on others rather than themselves (e.g., in a group setting). A loss of self-awareness also can occur simply through a loss of control of attention, perhaps as a result of an extreme focus on the immediate task or distractions in the external environment. To exacerbate this effect, after an initial breakdown of monitoring, people often simply stop monitoring altogether.

Third, both goals and monitoring presuppose a capacity to change or alter the self. However, because the capacity to change can be depleted by the mere act of self-control (i.e., ego depletion), a person's ability to regulate his or her behavior decreases. Reasons for ego depletion are many. Vohs and Heatherton (2000) examine whether tasks that

require self-control (e.g., refusing a tempting snack) affect the ability to self-regulate later and find that situational conditions, such as availability and temptation, create greater difficulty with self-control and therefore greater resource depletion. Other research has suggested that repeated, active choice making depletes self-control strength (Bruyneel et al. 2006). Impression management and self-regulatory resources also have been linked. Vohs, Baumeister, and Ciarocco (2005) find that when people try to manage their self-presentations, they exhibit less self-control. In particular, they suggest that unfamiliar situations, such as being in the presence of strangers, require greater self-presentation and, thus, more self-regulation.

When gambling, monitoring spending or battling with self-control may deplete the resources needed for optimal decision making. The need for impression management (e.g., suppressing emotions during a poker game) could further deplete the ego. Vohs, Baumeister, and Ciarocco (2005) reveal that it is most challenging for people to present themselves as likable and competent to a skeptical audience. For these reasons, gambling is a substantive domain ripe for further exploration of self-control issues.

Mental Accounting and Self-Control

In the context of gambling, the outcome of self-control is monetary. That is, people in most cases complete two simultaneous tasks: playing the game with some level of ability and trying to keep track of their spending (wins or losses). Research in the area of mental accounting complements self-control literature, because monitoring and goal-setting are both necessary for self-regulation. Thaler (1985) proposes that people psychologically categorize their money into different accounts, depending on the mental category evoked when they face a decision among alternatives. This category then determines the reference point for evaluating spending decisions. Henderson and Peterson (1992) argue that people formulate mental accounts in a particular context, similar to a script. That is, expectations of the advantages or disadvantages of an option differ across contexts as a consequence of variation in the expected script. The context of a mental accounting task may lead to differences across environments in the way people monitor their spending or establish spending guidelines.

Within a gambling consumption context, mistakes in decision making become particularly important. Baumeister (1994) states that casinos seem set up entirely to hinder self-monitoring. Differences in context could affect not just monitoring but also goal-setting and the capacity to change. For example, a casino trip may be categorized differently than sitting at home gambling online, which would cause more or less malleable spending guidelines in either environment. Similarly, one environment could lead to a greater need for impression management, increasing the likelihood of resource depletion and breakdowns in self-control.

To explore some differences between face-to-face and computer-mediated gambling, we employ a qualitative research approach in Study 1. We conducted phenomenological interviews with a sample of gamblers with experience in online and casino contexts. The interviews provide a deeper understanding of the lived experiences of online gamblers and an opportunity for a comparison with non–computer-mediated gambling. In particular, they focus on the impact of Internet gambling on mental accounting, self-control, and spending choices.

Study 1: Interviews

Method

Judgment Sample

The goal of phenomenological interviewing is to attain a first-person description of a specified domain of experience (Pollio, Henley, and Thompson 1997). The selection of the interview sample determines the domain of experience for contextualizing the conceptual framework. A small sample (usually three–ten people) allows for an emphasis on detailed descriptions and depth of understanding.

The interview volunteers were selected from both a mid-sized college town and a large metropolitan area in the U.S. Midwest. Informants were solicited through local newspaper ads and flyers posted around campus, in local restaurants, and in bars. Those who responded to the advertisements were screened by telephone or e-mail to obtain their age, experiences with casino and online gambling, gambling frequency, and preferred casino games. Criteria for selection included legal gambling age and sufficient gambling experience (i.e., had gambled multiple times at a casino or on the Internet or both). The sample included respondents with a range of online and casino gambling experience. Initial phone interviews identified a group of fourteen potential informants, seven of whom were chosen according to the judgment criterion. The seven informants completed a survey that consisted of assessments of their demographic information and gambling experience and the South Oaks Gambling Screen (SOGS; Lesieur and Blume 1987). The SOGS measures pathological tendencies in gamblers; none of the informants were problem gamblers. They received a small monetary payment for participating in the interview, but this compensation was not used as an incentive during the recruiting process.

The resulting sample consisted of five men and two women, 22 to 39 years of age (see Table 1). Four participants were Caucasian, one was of Indian descent, one was Hispanic, and one was Pakistani. Their experience with gambling ranged from two to nine years and varied across blackjack, slots, poker, and craps. One informant had experience only with casino gambling, whereas the others had varying degrees of experience with both casino and online gambling.

Interview Procedure

Before being interviewed, the selected informants were assured that that their anonymity would be maintained throughout the research process and that the purpose of the interview was to gain an understanding of gambling experiences. Each interview began with general background information and then gradually shifted to the topic of gambling. Throughout the interview, informants were encouraged to describe their personal experiences. Interviews were conducted in a private conference room and lasted from 45 minutes to two hours. The audio-recorded interviews were professionally transcribed verbatim, resulting in a 240-page, double-spaced text.

Table 1.   Informant Profiles

Name	Age	Gender	Online Experience[a]	Casino Experience[a]
Omar	23	Male	Blackjack	Blackjack, slots, video poker
Philip	27	Male	Blackjack	Blackjack, slots, video poker
Nick	32	Male	Poker, craps, blackjack	Poker, craps, blackjack, slots, video poker
Miranda	23	Female	None	Slots, blackjack
Carlos	22	Male	Poker	Poker, blackjack
Kendra	39	Female	Blackjack	Blackjack, poker, video poker, slots, craps
Barry	33	Male	Poker, blackjack	Blackjack, roulette, craps, slots

[a]Self-reported.

Analysis

The text analysis followed the procedures outlined by Thompson and Haytko (1997) and Murray (2002). First, a researcher read each informant's text and interpreted it as a single case. Informants indicated why and when they began gambling, how they experienced gambling in both computer-mediated and face-to-face contexts, and how they managed their spending when gambling.

Second, we sought overarching themes across the combined set of seven interviews. Two higher order themes emerged from the experiences expressed by the informants. These themes served to help answer the research questions and contribute to an understanding of mental accounting in computer-mediated environments.

Theme 1: Social Pressure and Self-Monitoring; Online Casinos as Safe Havens

Impression management is common in face-to-face contexts because people want to present a particular self-image (Goffman 1959). They often suffer an inconsistency between what they ought to be and what they actually are, and the gap between identities is a stigma (Goffman 1963). The use of impression management creates tension for the stigmatized person. Goffman (1959) compares managing impressions to being an actor on a stage, where the actor must convincingly perform his or her role before an audience. The informants' narratives in this study provided evidence of such impression management. Their stage was their gambling environment, and their audience was their fellow gamblers. Most of the informants indicated that their role as a player was an important part of their gambling identity. During their gambling experiences, each informant partook in a process of shaping and living his or her particular identity. Carlos, a 22-year-old college student, openly stated, "you gotta be an actor [at the poker table]," referring to his attempt to project a certain personality when gambling.

Because of the need for impression management in a face-to-face casino context, several informants used Internet gambling as "practice." Omar, a 23-year-old man from Karachi, Pakistan, is pursuing a career in hospitality management. His family immigrated to the United States, where they have resided for 17 years. When Omar was 18 years of age, he was exposed to online gambling while watching his friends play cards at a free website. He started to play on

the website with credits, or as he called it, "fake money, basically Monopoly money." Omar viewed his experience with these free gambling websites as educational; he used the experiences as a learning tool, which started his progression to online gambling for money and then casino gambling:

> It's free, they don't charge. It's for fun; you don't win anything. And I used that as how to understand the games, how to make the moves. Then I went to the online gambling. And from online gambling I went to the actual casino.... I started playing online one when I was 18 or 19.... That experience, it was a learning tool at first.

These "learning experiences" assisted Omar's progression into the world of casino gambling, giving him the confidence that he could gamble in the presence of others without appearing as an amateur. On his first trip to a casino, Omar decided to play slots because they seemed easy and did not require much money. He took only $5, and to his surprise, he won $600. While his first trips to the casino were made alone, he eventually began going with a group of friends.

Although Omar claimed he did not "gamble big," he would like to play with larger amounts of money in the future. Omar frequently used the term "big" to describe someone's status as an experienced gambler, such as an uncle who "is a gambler, but not that big." He recalled playing blackjack with a table of skilled gamblers and described the experience as "big-time gamblers putting out big-time money—not just $5, but like $100 every round." This account offers evidence of another progression in Omar's gambling narrative: from tentatively spending small amounts of money to confidently and eagerly wagering larger amounts to being a "big-time" gambler. Omar's inner struggle between being "big-time" and an amateur also surfaced when he played blackjack in a face-to-face context. At the blackjack table in a crowded casino, he perceived that others were evaluating his gambling strategy:

> You have this group of people standing around you and just want to watch and see how it's going with you. And a lot of times when that happens you kind of tend to hold back on the moves that you would make because you don't want to look stupid.

Other informants expressed a similar need for impression management in casinos. Nick, a 32-year-old male graduate student, has broad gambling experience, including various

games and contexts. Before returning to school for his graduate degree, Nick traveled to casinos about 12 times per year. He indicated that he enjoyed all forms of gambling but also drew a clear distinction between games that he plays against the casino (or Internet site) and those he plays against other players. At the poker table, Nick believed he must hold back his emotions, largely because he must "bluff" his opponents rather than celebrate their winnings (cf. playing craps, for which "everyone is on the same team at the table"). Nick could not become excited about winning; the very goal of the game was to hide this excitement:

> To the savvy poker player, which I'm not—I mean I understand the game but I don't understand reading people—you can tell by the things people do, the way they act, the way they look on a certain hand, if they start perspiring on a certain hand. I mean, people watch that that really play all the time and they see that every time what's-his-face over here has a good hand he jiggles his leg or he starts to sweat because he's excited and it's an emotion that he can't stop. And they just know. You can't make yourself sweat when you don't have a good hand, because you can't get yourself excited like that.

The inability to control these physiological responses is what Nick disliked about playing poker in the casino and the reason he prefers to play online. He believed that the lack of visual cues (e.g., being able to see someone sweat) leveled the playing field, giving him a fair shot at winning: "It's a lot easier [online] than in the casinos, because people can't see you and tell from your reactions."

Several respondents indicated that the pace of some games in casinos increased in response to pressure to make a move from other players at the table. Therefore, they enjoyed gambling online rather than in a face-to-face context. In the online poker room, a player has a limited time to place a bet, but because it is a virtual poker table, there are fewer external pressures. Nick claimed that this setting allowed more time to deliberate about his strategy, such that he could take the allotted time if necessary:

> [Online] there is a little time limit. It's kind of like a fuel gauge running out. Whereas you could sit at a casino table playing poker, and you might be able to pull off sitting there for 5 minutes thinking about your hand, but everyone at the table would really want to kill you.... They'd be yelling at you and complaining. Sure they would. "Rookie, get off the table!" Things like that. The pit boss would probably come over and say, "You're going to have to make it quicker. You're going to have to bet a little bit faster. You're irritating people." They'll let you know.

Barry, a 33-year-old network administrator, has experienced the same "time pressure" in a face-to-face gambling context:

> In a casino if you sit there and you're stalling or playing slow you're holding up the game. Then there's the pressure of people that are playing with you at the table, obviously they don't want to be held up.
>
> Interviewer: And online?
>
> You don't have that because you're the only one there. You're sitting by yourself at your computer, you don't have other people around you.

In the casino context, the social pressure not to irritate other players prevents players from taking the time they may

need to think about the game. Therefore, some gamblers considered the pace of the game faster in the face-to-face casino than online and regarded gambling online as a less threatening environment.

Other informants also expressed self-consciousness when gambling in a casino. Phillip, a 27-year-old man, currently works as a buyer for a large retail corporation. He began gambling in casinos at age 18 and on the Internet when he was 20 years of age. His father owned a video poker parlor, where customers would gamble for tickets that could be traded in for merchandise and gift certificates. Although Phillip has "tried just about everything," his most extensive gambling experience has been with blackjack.

Phillip claimed he was nervous the first time he went to the casino to play blackjack. Although he knew the rules of play, he was afraid that he would be judged by others at the table:

> The first time I went I had bought all these books on the rules of blackjack and all that. It was kind of nerve wracking at the table because I knew everybody else knew what they were doing and they were kind of yelling at you if you did the wrong thing. But I got better.
>
> Interviewer: What made you nervous?
>
> Everyone at the table here is so experienced, and when I did something wrong they kind of made a look or gestures or something.... If you hit when you're not supposed to, it kind of messes up the flow of the table, they say. It messes up what everyone else would get, the probability of it.

Barry also expressed nervousness when playing in a casino. Of his first experience playing blackjack, he noted:

> I was kind of nervous.... I didn't want to seem out of place or like a rookie, so you try not to make a mistake. Try not to seem nervous, or not to display it outwardly. You just want to fit in. You kind of get, look around and observe and see how everyone else is acting, what they're doing. You basically follow their lead, you know.

As evidenced in the informants' narratives, self-monitoring or impression management is common when gambling. They perceive less pressure to "maintain" their gambling identities in an online gambling context, evidently as a result of the computer mediation. This finding is consistent with social presence and self-awareness theories (Duval and Wicklund 1972; Short, Williams, and Christie 1976). Distinguishing between objective and subjective self-awareness, Duval and Wicklund (1972) suggest that environmental stimuli can cause a person to focus attention on either him- or herself (objective self-awareness) or the environment (subjective self-awareness). Objective self-awareness can be induced by the mere presence of another person who may be monitoring or evaluating the focal person. Subjective self-awareness occurs in environments with a stimulus strong enough to draw attention toward it and away from the self or when a person is not concerned with the possibility of being monitored or evaluated. Although online gambling often includes other people, the player must be concerned with being monitored or evaluated by those other people before he or she will experience objective self-awareness.

Phillip also commented throughout the interview that gambling online was similar to playing a video game:

It's just like playing video games. You lay down, it doesn't seem like you're losing money because it's just like playing a game, and you don't have the actual pieces to touch.

Interviewer: Tell me how that affects it.

You just don't think about it and you tend to bet more.

Philip's mention that "you lay down" to play when gambling online referred to his use of a laptop to gamble from the couch while lying down, watching television or relaxing. His ability to lie down physically while gambling at home differed from sitting at a crowded blackjack table in a casino. Being removed from the casino somehow distracted Phillip from his gambling. He thus was less likely to experience objective self-awareness when Internet gambling, lessening his need for self-monitoring.

Vohs, Baumeister, and Ciarocco (2005) also suggest that unfamiliar situations require greater self-presentation and, thus, more self-regulation. Our informants' narratives support this view. When they were uncertain about how to play a new game or surrounded by an evaluative audience of strangers, informants were more self-conscious about their behavior. That is, they expended more energy trying to "act" a certain way and thus enjoyed the game less. The removal of this social pressure in an online context led our informants to view online gambling as a safer alternative, one that allowed them to take their time without worrying about other players' opinions of them.

When the self is depleted by impression management, people exhibit less self-control (Baumeister 1994; Baumeister and Mick 2002; Vohs, Baumeister, and Ciarocco 2005). Thus, contrary to conventional assumptions, resources may be less depleted online than in a casino, which may lead to improved control over spending and a better focus on decisions in the computer-mediated environment.

Theme 2: Going Beyond Mental Accounting and the Use of Environmental Cues to Promote Self-Control

Baumeister and Mick (2002) specify that goals or guidelines are necessary for self-control. The informants all discussed ways in which they either used objects in their environment to help them account for their money or rearranged their environment to impose boundaries and improve self-control. They also reported that in a gambling context, they sometimes spent impulsively, lacked discipline, or lost track of their money. In response, they recognized the need to go beyond mental restrictions and redirect these tendencies. Self-control failure would occur if they deviated from spending guidelines. One way to monitor their behavior against an imposed spending guideline was through a form of mental accounting. We found though that people often went further than mental accounting, using their physical surroundings or environment to enforce their spending limits.

A 23-year-old woman with approximately two years of experience with casino gambling, Miranda usually travels to the casino with her fiancé and her extended family. To control her losses and reduce temptation, Miranda imposed temporal restraints on her gambling (e.g., leaving the casino at a predetermined time). These time constraints would be enforced by various family members. Even when her family

members were not in close proximity, Miranda remained aware of their presence and their influence on her gambling decisions. Her family helped control the lure that Miranda felt from gambling, establishing limitations that make gambling acceptable and safe:

I'll find him [her father] and I'll say, "We're going home now. Let's go!"

Interviewer: How do you know when you're going to quit playing?

If my time is up, like my dad said be back in 3 to 4 hours and I know that hey, I've got to go.

Interviewer: So even if you're winning you go at that time?

Yeah.

With respect to temporal restrictions, Miranda knew that gambling was tempting for her and that she might not stick to a time limit without her family's influence. For example, she might not want to leave in the middle of a winning streak or might want to stay to try to win her money back if she was losing. The temporal restriction imposed by her family prevented Miranda from staying longer than planned and enabled her to impose boundaries on her family members' gambling as well.

Thaler (1985) suggests that people employ mental accounting as a self-imposed mechanism to control spending. In Miranda's case, the self-control mechanisms were physical as well as mental:

I try not to take my credit cards or debit cards, because I know I'll use it somehow. But if I do, then I'll leave it in the car just in case for the drive or to eat on the way. But I avoid taking them into the hall, into the casino.

Interviewer: Tell me more about that.

Well, I bring in my cash into the casino and try to avoid it from using my debit, because it's so tempting because everywhere you look is another ATM where you can use a credit card withdrawal. And if you are to do that, it's more tempting for people and they could be sitting there all day. That way it's like you have certain times and certain money so you know you have to get out. And once you go to the car, just to get an ATM, of course you will get up and leave. Because you're already in the car; you might as well go home.

Miranda also established a way of physically keeping track of her money and regulating her spending when playing blackjack at the casino: She placed her casino chips into stacks and then evaluated the stacks to keep track of her winnings or losses. She also kept cash in reserve in her pocket, rather than redeeming it for chips all at once:

Okay, say I go in and I put this money down and I probably just give him $100 straight. And he's giving me coins [chips] for it. And I keep on betting, and every time I'm betting I can see my stacks are going up or down. And like, say the $5 chips, I can count that I only have 10 chips or something like that. Then I know that I am losing. But I still have that $100 in my pocket. So say I've lost my whole cashing in $100. I know how much money I have and then also I can count my chips to see where I am. If I am winning, then another stack will probably build up.

Interviewer: You don't give them all the $200?

No. I keep the $100 in my pocket.

Miranda's practice of leaving her credit card in the car outside the casino and keeping half her spending money in her pocket demonstrates her inner struggle to keep track of and control her spending. Although she knew that she should not spend money beyond her preset limit, she also believed she would be tempted to do so if she had her credit card with her while she gambled. If she intentionally imposed a "waiting period" on her spending—the time it takes to walk to the car—she would likely rethink her decision to spend more money and instead go home. Thus, she was not confident that she would be able to reason with herself to stop spending without this environmental control.

Nick's narrative further illustrates this theme. His game of choice was craps because of the fast pace of the game.

> You can walk in with $50 and end up, up so much so fast. But you can go through it just as fast. That's the thing with craps. It's so quick. What's quick about it, it's just, you roll, you get your bets down. They give you the dice, you roll again. You get your bets down ... then you just go again, and you just go again. It just starts going so fast. And people really get irritated at the table if it's taking a while—if you're taking a while with your bets. You just take the dice and roll 'em.

Nick emphasized that the quick nature of the craps game sometimes distracted him from counting his money. He usually counted it only during a losing period when the table's party-like atmosphere was in a lull:

> It's difficult because you've got so much going out and so much coming in sometimes. Usually what will happen is you go on some big tear where somebody's rolling. And then when that, you know, finally when that calm comes, someone rolls a seven and it's moving on to the next person, the dealers have to go through the process of taking all that money off the table, stacking it up, putting it in the right thing. So you've got a minute or two there to breathe, order your drinks, whatever you've got to do.

When playing craps, Nick became very involved in the action at the table. He had "too many things going" to think about his balance or to figure out where he stood financially. Instead, he waited for a lull in the game to distance himself physically and evaluate his wins or losses. In this way, Nick relied on his environment to impose a boundary for his spending. Nick also reported that he often took only a small amount of money to the casino but had additional money that he would be willing to take out of his bank account. Although he mentally labeled a certain amount of money as available for gambling, he still imposed a physical restriction on his spending by keeping the majority of the money in his bank account.

Philip also imposed external environmental controls to avoid temptations and guard against impulsiveness while gambling. For example, he used a special credit card when gambling online with a maximum credit limit of $100:

> I got a credit card for $100 max, and they control the max. So I put in my credit card number and just gambled that $100, and when it was gone I just tried paying that off and tried it again.
>
> Interviewer: So how do you determine how much credit?
>
> I usually, I only do it for $100. I don't want to go over that.
>
> Interviewer: So you set that limit?

> Um-hmm. All you can play is the credit that you have on your credit card and you enter that. I just put $100, because that's what I have my credit card.

Philip's purposeful use of a credit card with a low balance prevented him from going over his preestablished budget.

Kendra is a 39-year-old married woman who works for a nonprofit organization. She has extensive experience gambling both online and in casinos, often taking multiday gambling trips with friends. Despite her experience, Kendra used an elaborate system to keep her from overspending at the casino. She reflected, "I would actually put [money] in envelopes that said Thursday, Friday, Saturday, Sunday. Friday and Saturday would have the biggest chunk, Thursday and Sunday wouldn't have as much." Even using her envelope system, Kendra struggled to keep a running total of what money she has won or lost: "I can have cash in my wallet and chips at the bottom of my purse. I'll have a pretty good idea of about what I've got, but I don't know for sure until I get back to the [hotel] room."

Late in his interview, Phillip commented that he did not feel that he had as much control over his gambling in an online context because he did not have chips or coins to touch. He indicated his habit of betting the maximum amount allowed when playing with credits, but playing with real coins "slows him down" and made his money last longer. Phillip thus perceived the presence of the chips (or coins) as a built-in control on his gambling:

> In Kansas City or Vegas they all use chips to carry around in buckets. I like it better because you have to handle it and I don't usually bet as much. It takes more time.
>
> Interviewer: You like which one better?
>
> I like the chips. Because credits, I usually just max the credits. It's a lot easier to bet quicker and lose quicker.
>
> Interviewer: OK. Versus the other, you do what?
>
> I just put in one at a time, play for fun.

His comment that the chips "take more time" indicates a built-in environmental control, associated with the need to perform the physical task of putting chips into the machine. When betting with credits instead of coins or chips, Phillip automatically bet the maximum amount. To bet the maximum amount using coins or chips, he would need to put three separate coins into the machine, a task that forced him to bet more slowly and not to lose as quickly. In the casino environment, Phillip recognized that touching the chips and being forced to put them into the machine one at a time allowed him to slow down his betting. In this way, he relied on his physical environment to help impose a restriction on his spending.

Phillip perceived his money as being deducted from his account immediately. Although it was a credit, he thought of the $100 balance on his card as "his money," as if he had a bank account with $100 in it. The casino was taking "his money" from his account and holding it while he gambled. He explained that "if you lose they keep it," such that he perceived that the casino took possession of his money before his actual loss. In reality, the credit card company gave money to the casino for Phillip to use to play. Phillip did not actually "pay" for his gambling until his credit card

bill came in the mail. Nevertheless, he perceived that he paid for his gambling at the time he played.

Depending on the outcome, the online casino would "give part of [the money] back" if Phillip won, a shifting of his mental accounts. Technically, Phillip only would give money to the casino if he placed a bet. For example, he might log on to the casino website with $100 approved credit and place a $5 bet. He has lost this money only if he loses his bet. In his perception though, Phillip has given the casino $100, and if he wins the $5 bet, he will be "given back" some of the money.

Not only did the informants use their external environment to help impose boundaries on their spending, but they also employed objects to help them keep track of their wins and losses. When visiting the casino, Miranda put half her gambling money in her pocket while playing. As she played, she also kept her chips stacked in such a way that she could tell without counting how much money she had left. If she had no stacks left on the table, she "isn't really out of money," because she still had the original reserve in her pocket. Similarly, when playing casino poker, Carlos would take his money and "[push] it aside into separate stacks" to keep track of his winnings, but he also believed that other players perceive this chip stacking as a weakness. Thus, Carlos faced a conflict between the two themes we have identified in this study. On the one hand, Carlos needed to go beyond mental accounting and use his environment to keep track of his spending; on the other hand, he needed to manage other players' perceptions of him and act out his identity as an experienced poker player.

Similarly, Philip used a stack of chips to help him determine when to reduce his bets at blackjack. He devised a way to use physical objects (chips) to help him strategize about the game:

> When the face cards come out, I count them by five. After five face cards come out, I put a chip over to the side so I know he's already used up five [face cards]. If four aces come out, I put another chip over to the side to keep track of aces. I usually wait until there's about fifteen or twenty face cards and maybe eight or sixteen aces ... then I start betting less.

Omar also used objects to track his money in the casino. Similar to Miranda's strategy, he would cash in only part of his money and keep the rest in reserve. Omar started with $100 worth of chips, placed in a stack in front of him. If at any time throughout the game he won more than his original $100, he would start a new stack of chips and place the "original" $100 in chips in his pocket. He preferred to "play with his winnings," keeping his initial money separated physically from the money that he won. This preference is a common anomaly from an economic perspective, because all money rationally should be treated equally and be equally expendable.

Nick employed a similar form of physical accounting for his money. He commented that often he became "so absorbed in the game that it's hard to keep up." To limit the amount that he spent, Nick would put a few extra chips in his pocket as a reserve. He stated, "It's a nice surprise when you wake up in the morning and you've got a few hundred bucks in your pocket." This description is further evidence that in the excitement of the moment, Nick realized his

need to control objects in his environment physically (i.e., the chips) so that he would have money left for the next day. Nick also claimed he could tell how much he was winning or losing by looking at his chips and that he checked his stacks of chips "every so often" to determine his financial standing.

This second theme can contextualize and contribute to self-control and mental accounting theories. Literature on self-control failure suggests that monitoring spending is critical for self-control (Baumeister 1994; Baumeister and Mick 2002). According to mental accounting theory, people have problems with restraint, which creates the need for monitoring. Therefore, they develop internally enforced guidelines to control their spending behavior (Thaler 1985, 1990; Thaler and Shefrin 1981).

The informants' gambling experiences revealed that they intend to categorize their money but lack confidence in their ability to monitor their spending mentally. This is not to say that the informants do not engage in some form of monitoring, but they feel compelled to use their environment and physical surroundings as well to augment their mental accounts. All the informants provided examples of behaviors that extended beyond mental accounting and provided more tangible ways of establishing boundaries.

In computer-mediated gambling contexts, the physical means of accounting were not always present. For example, there are no chips to stack to keep track of winnings and no cash to put in one's pocket to keep from spending. Some online environments also lack the built-in temporal delays of face-to-face gambling contexts. For example, Miranda knew that if she spent her allotted money at the casino, she must return to her car to get more money, which created a "waiting period" to temper her spending. Philip played with credits in an online environment, which led to faster play than feeding coins into a machine. In summary, computer-mediated environments remove physical and psychological means of keeping track of spending, leading to reduced self-control and mental accounting inaccuracies.

Although not a universal theme, many informants expressed a sense of mindlessness associated only with online gambling. According to Kendra, online poker is "just a zone out kind of thing ... you don't even realize, you just keep hitting the button, and I'm kind of in a trance with it, not paying attention. At the casino I am very alert." Online gambling websites may facilitate this mindlessness by allowing players to select automatic settings their default setting, enabling them to gamble without even thinking about the cards in their hand. When playing online poker, Carlos noted that "you can actually play in certain ways you don't really have to think about it. You just kind of click, fold, fold, and there's little boxes you can check to say that if someone bets so much then you're just automatically going to fold your hand." Carlos reduced his risk of big losses when gambling online by playing four different "windows" in a card game. That is, instead of one game in which he would bet $20 per hand, he opened four separate windows with games of $5 per hand to diversify his risk. Barry also noted that one gambling website "keeps a running total" of his wins and losses, which lessened the need for his full attention to wins and losses. In contrast, the informants expressed hyperawareness in the casino envi-

ronment, such that they constantly self-monitored, manipulated their environment, and considered those around them. This "performance" became a strategic balancing act involving both cognitive and emotional effort, which was much more involving than the mindlessness of the online gambling environment.

Study 1 thus has provided evidence that people are affected by the context in which they gamble. In a face-to-face context, a heightened need for impression management may impair their ability to allocate the cognitive resources necessary for self-regulation. Online gambling appeared "safer" for those learning a new game or playing with strangers, so gamblers used it as a learning tool to prepare for riskier casino gambling. Gamblers often employed their physical environment to help impose spending controls, and environmental cues affected their perceptions of the experience. Some informants believed that the online context led to more rapid, sequential choices and consequently more difficulty keeping track of spending, so they often built in extra time to evaluate their account balances.

Through the use of a controlled experiment, in Study 2 we further investigate two factors that may affect people's ability to exert self-control when gambling. First, the use of intangible currency is unavoidable in computer-mediated gambling and may make monitoring of spending more difficult. Second, because online gambling enables click-speed decisions, we also consider the pace of betting or speed of decision making.

Characteristics of Online Environments

All computer-mediated transactions require intangible currency, such as credit or debit cards. Specifically, Internet gambling contexts demand that players pay with credits instead of tangible coins, chips, or cash. Typically a player sets up an account on the website, with credits deducted or added to the account as he or she wins or loses.

Offline, credit card use enhances spending (Borgen 1976; Huck 1976). Hirschman (1979) finds that people make larger total dollar purchases when they use a credit card than when they use cash. In addition, the use of credit cards during transactions decreases the perceived cost of purchases (White 1980). Feinberg (1986) shows that though the presence of credit card stimuli do not affect consumers' self-reported motivation to spend, they enhance the magnitude of spending and reduce decision time. Feinberg also suggests that as people spend with credit cards, they become conditioned and associate credit card stimuli with spending. Prelec and Simester (2001) also find that willingness to pay is significantly greater for people who expect to pay with a credit card rather than with cash. These findings, along with the results in Study 1, suggest that the use of intangible currency in a computer-mediated gambling context alters the way gamblers make spending decisions.

The existence of rapid, sequential choice is another common characteristic of computer-mediated environments. As suggested by the interviews in Study 1, online gambling contexts do not include naturally built-in wait times, as traditional casinos do (e.g., waiting for cards to be shuffled, coins to register in a slot machine). Koyuncu and Bhattacharya (2004) reveal that the speed of online transactions

significantly contributes to consumers' decision to shop online. Although the quickness of online transactions may be convenient in a shopping context, it may have a potential negative effect for gambling.

Research that has addressed mental accounting generally investigates the choice between two static options, whereas few studies consider situations in which rapid, multiple choices occur in sequence. Redelmeier and Tversky (1992) find that people tend to segregate multiple independent choices, viewing each as a separate event, and Antonides (1994) shows that a model of segregated evaluation of payoffs better explains choices than a model of integrated evaluation in a sequential prisoner's dilemma game. However, neither study examines in-the-moment spending.

Wedell and Bockenholt (1994) investigate mental accounting in a study in which they asked participants to accept either a 50–50 gamble once or a 1-in-100 chance in repetitive turns. In the single gamble scenario, participants justified their decision using economic probabilities, but they were more likely to use integration strategies for the repeated gambles scenario. With a repeated gambling opportunity, participants viewed the overall economic change in totality, rather than as 100 instances of a 50–50 chance. These findings suggest their reliance on previous outcomes in a decision sequence, similar to the findings from the interviews in Study 1. However, Wedell and Bockenholt's study also relied on the use of a hypothetical scenario rather than actual, real-time decision making, which may not provide an accurate representation of how people employ mental accounting in realistic situations. In Study 2, we conducted an experimental study to examine rapid, sequential decision making in a computer-mediated gambling context and thus determine the underlying process of mental accounting and self-control.

Study 2: Experiment

To investigate some of the findings from Study 1, in Study 2 we employed a controlled experiment using a computer-mediated gambling task. Study 1 suggested two elements of online gambling that may affect the accuracy with which a gambler maintains in-the-moment mental account balances. First, the pace of decision making depends on temporal delays between intervals in a series of gambles. The longer a person can think between choices, the more accurately he or she should be at assessing changing balances. Whereas online gambling enables click-speed decisions, thus reducing the time gamblers think about and account for their spending, social pressures to "hurry up and bet" in a casino context may result in faster decisions too. Second, the vividness of the gain or loss can be manipulated by altering the currency tangibility. Most informants in Study 1 used physical cues (coins, chips) to keep track of their spending. Because more concrete and imaginable information is easier to retain in memory, the use of physical money (tangible currency) should help people keep better track of their gains and losses than the use of intangible currency. This prediction depends somewhat on the degree of effort the person expends trying to track his or her spending, and the degree of cognitive effort expended could account for some variance in accuracy. In line with this discussion, we propose the following hypotheses:

H$_1$: Gamblers given a long delay between choices (a) are more accurate at maintaining their in-the-moment account balance and (b) give more accurate assessments of their overall ending balance than gamblers given a short delay.

H$_2$: Gamblers using intangible currency (a) are less accurate at maintaining their in-the-moment account balance and (b) give less accurate assessments of their overall ending balance than gamblers using tangible currency.

Method

Participants and Design Overview

The participants were 150 male and female undergraduate students, assigned randomly to each cell in a 2 (time between decisions) × 2 (type of currency) design. The conditions for time between decisions corresponded to the amount of time that participants had between intervals in a series of computerized sequential gambles (short vs. long delay). The conditions for the type of currency varied according to whether they had tangible or intangible currency to bet with during the game.

Experimental Procedure

The experiment was conducted in a laboratory setting, and all data were collected using MediaLab Version 2002.2.10 software. Participants were informed before the experiment that they would receive $2 as compensation for participating in a study involving a series of computerized choices. Participants entered the computer lab in groups of ten and were seated at individual computer terminals divided by partitions. They then received either a voucher for $2 or an envelope containing $2 in dimes as compensation for participating in the experiment. Participants were told that to make the task more interesting, they would have the opportunity to increase or decrease their $2 by betting on the outcome of their choices. To avoid subject suspicion or hypothesis guessing, the participants in the intangible/tangible currency conditions were block randomized and run in separate sessions.

A controlled computer program, similar to a roulette game, was developed specifically for this study. For a sequence of 20 choice intervals, participants selected a color (red or black) and number (1–5) combination, chose the amount to bet ($.00, $.10, $.20, or $.30), and activated a button on the computer screen to trigger the computer to generate a color/number combination. Several times throughout the choice sequence, participants were prompted to estimate their current balance, and a control computer recorded each person's estimated and actual balances throughout the computerized sequence. To maintain the consistency of the experience across all participants, all computers were programmed to "win" and "lose" the same number of times. For example, on intervals programmed to win, the computer automatically generated the same color/number combination chosen by the subject. Participants were unaware that the sequence of outcomes was controlled by the experimenter. All participants won both their first and last gamble, to control for primacy and recency effects.

Participants in the intangible currency condition kept track of their account balance mentally throughout the

game. Those in the tangible currency condition had two cups at their computer terminal, one labeled "your money" and one labeled "bank." They deposited their $2 in dimes into the "your money" cup and then physically added or removed coins from this cup, depending on the outcome of each choice interval. They were instructed not to look in their cup or count the coins when estimating their balance, which ensured that the physical task of transferring the dimes was the only difference between the two conditions. Any differences in accuracy thus could not be attributed to the participants being able to count their dimes at any given time. Two experimenters carefully monitored compliance with these instructions during the experiment. To ensure no differences in task effort across the tangible and intangible currency conditions, a pretest was conducted in which subjects in the intangible currency condition performed a similar physical task to those in the tangible currency condition (i.e., transferring jelly beans rather than dimes). If the added task of transferring dimes in the tangible currency condition created an unfair advantage for those participants in the intangible currency condition, it also would emerge when the task involved transferring jelly beans. However, the pretest results indicated that the task effort was equal across conditions, regardless of the presence or absence of the physical task ($p = .34$).

Before beginning the experiment, participants in all conditions received written instructions on their computer screen. Simultaneously, the instructions were projected on a video screen and read aloud by the experimenter. Those in the tangible currency condition were shown how to move their wins and losses from the "bank" to the "your money" cup. Participants also were informed that their beginning balance for the game was $2 and that they could assign a bet for each outcome combination, corresponding to their confidence that their guessed outcome would be correct. The experimenter then projected a demonstration of the computerized choice sequence on the video screen, including five practice intervals, before the participants began their gambling sequence.

After completing 20 gambles, all participants electronically responded to a survey with the dependent measures. Next, each person was ushered individually into a separate room to settle his or her balance and receive a printout of his or her ending balance, as recorded by the control computer. People in the tangible currency condition counted the number of dimes in their money container, and any errors in accounting were noted. They were then allowed to take any remaining money and were dismissed. Participants in the intangible currency condition traded in their voucher for an envelope containing $2 in dimes. They then paid the experimenter for any losses that they incurred during the task and were dismissed with any remaining money.

Dependent Measures

Each person's account balance was recorded throughout the gambling sequence. Participants in all conditions were prompted six times during the task to enter their current balance in a space provided on their computer screen. The prompts followed wins and losses an equal number of times. The control computer recorded their actual adjusted balance after each interval. For example, if a participant

chose the combination of black/5 and bet $.30 and the actual outcome was red/6, $.30 was deducted from that participant's actual recorded balance. Similarly, if the actual outcome was red/5, they received an additional $.30 in their balance. This accounting enabled us to compare participants' self-reported account balance with their correct computer-recorded balance. At the end of the sequence, a prompt also asked the participants to enter their overall ending balance, which we compared with their computer-recorded balance to assess overall accuracy.

Participants who concentrated more on the task should be more accurate in maintaining their balance because of the cognitive nature of the task. Therefore, we assessed cognitive effort as a potential covariate. The measure of cognitive effort (Cooper-Martin 1993) used a five-item, seven-point Likert scale, with the endpoints "strongly disagree/strongly agree" (Cronbach's α = .75, sample item, "I concentrated a lot while making this choice").

To test the hypotheses pertaining to participants' accuracy in maintaining their in-the-moment account balance, we computed a difference score by calculating the discrepancy in the absolute values of their estimated and actual balances. For example, if a participant estimated that his or her balance was $1.80 and the actual balance was $1.30, the difference score was $.50. To test the hypotheses regarding maintaining an updated balance, we took an average of the difference scores across all six balance prompts. Each difference score for the balance prompt at the end of the choice sequence served to assess the accuracy of the estimated final balance.

Finally, as a manipulation check for the time delay, each participant responded to two five-point Likert items: "I did not have enough time between intervals while playing the game" and "I felt that there was too much time between game intervals" (1 = "strongly agree," 5 = "strongly disagree"). Participants in the short delay condition should agree more strongly with the first statement, whereas participants in the long delay should agree more strongly with the second statement. A one-way analysis of variance (ANOVA) indicated that the difference in agreement with both items across conditions was significant and in the expected directions ($p < .01$). Therefore, the time delay manipulation was successful.

Results

We predicted main effects of time delay and currency tangibility on accuracy in maintaining an updated balance during the gambling sequence. The cognitive effort covariate was not significantly correlated with accuracy in maintaining an in-the-moment account balance and therefore was not included in the analyses. To test H_{1a} and H_{2a}, we ran an ANOVA with currency tangibility and time delay as independent variables and average in-the-moment accuracy as the dependent variable. The results of the overall ANOVA showed a significant effect of both currency tangibility and time delay on maintaining an updated in-the-moment balance ($ps < .05$). No significant interaction emerged between the two factors. An analysis of the main effects revealed that participants using intangible currency were significantly less accurate ($F(1, 92) = 6.47, p < .05,$

$M_{intangible} = 10.54, M_{tangible} = 4.06$). In addition, participants in the short time delay condition were significantly less accurate in maintaining their in-the-moment balance ($F(1, 92) = 4.40, p < .05, M_{shortdelay} = 9.97, M_{longdelay} = 4.62$). These findings support H_{1a} and H_{2a}.

We also predicted main effects of time delay and currency tangibility on the accuracy of the overall ending balance. The cognitive effort covariate correlated significantly with this dependent variable but not with the independent measures. Therefore, we included the covariate in the analyses for overall balance. To test H_{1b} and H_{2b}, we ran an analysis of covariance (ANCOVA) with currency tangibility and time delay as independent variables and overall balance accuracy as the dependent variable. The results of the ANCOVA showed a significant effect of currency tangibility ($p < .05$) but only a marginally significant effect of time delay ($p = .07$). There was no significant interaction. The analysis of the main effects revealed that participants using intangible currency were significantly less accurate in assessing their ending account balance ($F(1, 91) = 5.08, p < .05, M_{intangible} = 17.04, M_{tangible} = 7.28$), in support of H_{2b}. Those who experienced a short delay between choices were somewhat less accurate in assessing their overall balance than the participants in the long delay condition, but the difference was only marginally significant ($F(1, 91) = 3.47, p = .07, M_{shortdelay} = 16.23, M_{longdelay} = 8.07$). Thus, H_{1b} does not receive support.

Discussion

The results of Study 2 indicate that it is more likely that people lose track of their spending when using intangible currency, a prerequisite of online gambling. If a person does not keep an accurate mental account balance when gambling, he or she might make different betting choices. At the end of the gambling session, the gambler also may realize that he or she spent a different amount than that amount mentally calculated.

Study 2 featured a real-money choice sequence and thus contributes to mental accounting literature. Study 2 extends this body of research by investigating the implications of rapid, sequential choices on a gambler's ability to keep track of his or her in-the-moment account balance. Tests of the effects of a time delay showed that participants in the long delay condition were more accurate than those in the short delay condition in terms of maintaining an accurate in-the-moment balance. The length of the delay did not seem to have any effect on the accuracy of the end balance though. Finally, the use of intangible currency resulted in significantly less accuracy for both an in-the-moment balance and an overall balance.

General Discussion

Gambling is arguably one of the most regulated (and controversial) consumer services worldwide, subject to geo-, regional-, national-, and state-level parameters. In the United States, the accessibility of online gambling, as a result of the expansion of the Internet, has raised further regulatory and legal issues. In countries where online gambling is legal and regulated, online gambling service providers enable people to self-exclude from websites or

place deposit limits on their accounts (Chambers and Wilcox 2009). The degree of control that U.S. and state governments should apply, including consumer protection issues related to the security of payments and the exclusion of children and compulsive gamblers, remains under debate and development. The effects of UIGEA initially caused a precipitous drop in the weekly usage of Internet gambling sites among some demographic segments (Annenburg Study 2008). Federal and state governments have begun to reconsider regulated online gambling as a source of revenue, with new legislation to that effect pending as of this writing (e.g., H.R. 2266; H.R. 2267). Yet hundreds of thousands of people participate in gambling every month, whether or not the practice is legal. The combined results of our two studies add further information to the discussion of the regulation of online gambling and have direct implications for public policy makers, as well as for consumer researchers.

The interviews we conducted in Study 1 suggest that gamblers often employ physical controls, whether extracted from their external environment or created by themselves, to manage their own behavior and keep track of their money. The Study 2 results reveal that a person's ability to track his or her mental accounts accurately can be impeded by the speed of decision making and the incorporation of intangible currency.

Mental Accounts and Context Dependency

These findings support the assertion that mental accounts can be affected by categorization and that mental accounting occurs differently in online versus face-to-face contexts. This finding is consistent with prior research that concludes that context determines mental accounts in a spending situation (Henderson and Peterson 1992; Kahneman and Tversky 1984; Thaler 1985); the categorization of an expense or payment affects the mental account with which it is associated (Henderson and Peterson 1992).

A schema or categorization explanation may account for these differences. The informants in Study 1 developed schemas associated with casino gambling that involved cues, such as the casino's lobby, coins to touch, music, and people. In the absence of these cues, they accessed different schemas and recategorized their online gambling experience as playing rather than gambling. This recategorization led to a change in their mental accounting processes.

Although gambling in a computer-mediated context seemed less risky to our informants than gambling in a casino, people still spend large amounts of money in this context, without any physical cues that normally would help them manage their mental accounts. Observers concerned about the social impact of Internet gambling suggest that players often forget they are playing with actual money.

Our research also suggests that the tangibility of the currency used during a transaction has important implications for mental accounting. In Study 2, we found that participants who used a voucher were significantly less accurate when keeping track of their money than those who used real coins during the gambling sequence. The people in the intangible currency condition also were less accurate at reporting their balance at the end of the sequence. This

inability to maintain an accurate mental account while using intangible currency remained consistent, regardless of the pace at which they proceeded through the game. Even with ample time to count their wins and losses, the imprecision of their calculations persisted. In contrast, participants using physical currency were more accurate in keeping an updated balance and reporting their ending balance, even though they were not permitted to count their money during the game.

Along the same lines, a universal theme in the Study 1 interviews was the use of physical surroundings to help manage gambling decisions and assist with mental accounting. Tangible currency helped the informants maintain control over the amount of money that they gambled. For example, Phillip said that when playing with computer credits (intangible currency), he tended simply to "bet the maximum" and pay less attention to the game. In the casino environment, Phillip noted that merely "touching the chips" allowed him to slow down his betting and spend less money. When Nick became so absorbed in the game that he could not keep track of his winnings, he physically removed chips from the table and placed them in his pocket so that he could not overspend.

In computer-mediated environments, such "forced waits" are removed from the consumption setting. Our results confirmed that an increased pace of decision making led to less accurate accounting. As illustrated by Nick, when the pace of the game is fast, gamblers do not monitor their spending; instead, they wait for forced delays to evaluate their account balance. When we investigated this behavior experimentally, we found that participants who encountered a 15-second delay between making bets in a gambling sequence kept more accurate in-the-moment mental account balances than those who only had a 5-second delay. The absence of the forced wait applies not only to gambling contexts but to a wide variety of other consumption scenarios as well. For example, the time it takes a person to walk through a retail store, place items in a cart, and then wait in the checkout line gives that consumer time to consider and think about the purchases. When shopping in a virtual storefront, consumers can add items to the virtual shopping cart with the click of a mouse, and the entire shopping experience may last only a matter of minutes.

The use of intangible currency and rapid decision making reduced participants' accuracy in keeping track of their money. In a casino environment, tangible currency serves as a self-control mechanism that enforces mental accounting guidelines and provides a cue about account balances. In computer-mediated environments, the absence of tangible currency removes these cues, such that inaccuracies and loss of self-control affect cumulative spending. These inaccuracies become intensified by the more rapid pace of the spending decisions.

This research also provides evidence that accurate monitoring of spending is necessary for self-control, even among noncompulsive gamblers. As we noted previously, service providers that operate in countries with legal online gambling offer means for users to exclude themselves from the sites or place deposit limits on their accounts (Chambers and Wilcox 2009); several U.S. states enforce self-exclusion and betting limit rules for casinos (American

Gaming Association 2008). Our research suggests that legislative provisions that slow down or briefly stop betting activities could further protect consumers.

The implications of these findings also may be extended to recent technological advances in ticket in/ticket out (TITO) coinless casino slot machines (Palmeri 2003). These commonly used machines pay consumers with paper vouchers that can be inserted into other machines. Managers of casinos are implementing these coinless slot machines in part because they reduce the cost of labor and speed up playing time by decreasing the number of breaks needed to get change and refill machines. The technology also eliminates the need for consumers to wait to be paid by a floor worker after winning a jackpot. Our findings suggest that coinless machines could reduce players' awareness of the money they are spending and reduce their accuracy in maintaining mental accounts. Vouchers necessitate the use of intangible currency and also speed up the pace of the game, both of which compromise mental accounting. As with online gambling, coinless slot machines also eliminate a built-in delay. The voucher enables people to keep playing until their entire balance is gone, never needing to stop and count their money. Yet TITO technology is a bridge to more electronic-based gambling in casinos. Anticipated innovations include interactive slot machine interfaces, credit promotions (e.g., tour promoters hand out slot machine credits to customers), and the acceptance of debit cards in the machines (Palmeri 2003; Terdiman 2003), all of which merge the characteristics of computer-mediated and face-to-face environments.

Several opportunities for additional research arise from our findings. First, studies might provide a more abstract representation of the tangible currency, such as using chips that represent varying levels of currency rather than actual coins. The informants in Study 1 used their casino chips to manage their mental accounts; further investigation is needed to clarify the mental accounting that involves a more abstract cue.

Second, further research should explore other areas of experiential consumption and contextualize and add external validity to our findings. Researchers might investigate forms of consumption beyond experiential goods, such as tangible products and services.

Third, considering the relevance for current consumption, research should investigate the mental accounting implications of using fast-pay, contactless payment methods (e.g., RFID). Not only do such technologies enable consumers to pay without tangible currency, but they also reduce the necessary transaction time and eliminate the need for the physical handling of any product or payment. According to research related to children's and adolescents' uses of computer games (Griffiths and Wood 2000), it is important to examine possible links between currency-free, computer-mediated game playing and youth adoption of intangible, currency-intensive, computer-mediated gambling.

Conclusions

This research represents a step toward understanding the impact of Internet-mediated gambling for individual consumers, particularly as government and industry efforts continue to develop. The studies provide evidence that computer-mediated gambling creates a different experiential context for participants, which may put online gamblers at greater risk than that faced by gamblers participating in non-electronic gambling environments. It is useful to consider individual characteristics and behaviors related to gambling in both contexts, as well as the potential for government or industry controls that would work in conjunction with internal, individual, self-regulatory, psychological and behavioral mechanisms.

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