The Influence of Casino Architecture and Structure on Problem Gambling Behaviour: An Examination using Virtual Reality Technology

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Abstract: The results of three studies are reported which were designed to provide converging evidence of the emotion and gambling behaviour that are induced by casino settings. Two overall macro casino designs were examined in this research: the *playground* design (high ceilings, spacious layout, the inclusion of elements of nature) and the *gaming* design (low ceilings, maze layout of machines, no extraneous décor). A conjoint study was conducted (n=275) that afforded the measurement of a number of décor variables in combination. Results confirmed that the propensity to gamble beyond planned levels and the level of restoration experienced are both higher for a *playground* casino than for a *gaming* casino; higher gambling was reported when travel distance to a casino was shorter; higher levels of restoration when a music soundtrack was played. Focus group research (n=24) provided rich descriptions of gambling settings, validating the provision of the desired overall macro designs and specific décor elements in casinos. Finally a study (n= 445) was conducted using virtual reality technology, a 360º Panoscope, which immersed participants in a casino settings varying in their overall macro design (*playground* versus *gaming)*, the type of emotion (arousal versus pleasure) induced by a landing strip (entrance setting) and the inclusion of restorative images in the gambling setting. The findings were particularly dramatic for females exposed to a *playground* setting: gambling by females was more conservative in a *playground* setting, with positively-valenced restorative images and with a pleasure-inducing landing strip. For both males and females exposed to a *gaming* design, at-risk gambling intentions were not influenced by landing strip and restorative image interventions. The different pattern of results yielded for at-risk gambling intentions and restoration underscores the potential for research on casino environments to uncover less harmful design elements which have separate effects on these two variables.

Keywords: casino environment, environmental emotion, restoration, at-risk gambling, environmental psychology, multi methods

1. Introduction

The goal of the current research was to examine how specific décor elements of gambling environments influence emotions engendered within a gaming setting and consequently affect problem gambling behaviour. Studies of vulnerability to develop problem gambling behaviour have tended to focus on biological, social, emotional, cognitive and gambling machine factors, while neglecting the role of environmental variables. Yet environmental features may combine to "trigger" the cognitive and behavioral consequences underlying problem gambling (Sharpe and Tarrier 1993). The Productivity Commission Inquiry into Australian Gambling Industries (1999) recognized the centrality of environmental factors in the constellation of influences on problem gambling: "we are referring to environmentally induced conditions which contribute to disassociating the person from the reality of the time and money spent, altering the states of mood or level of arousal and facilitating the opportunity to chase losses" (p. 188).

Several studies have been conducted examining the effects of casino environment as they interact with gambler personality on gambling behaviour (Finlay, Kanetkar, Londerville and Marmurek 2006; Finlay, Marmurek, Kanetkar and Londerville 2007; Marmurek, Finlay, Kanetkar and Londerville 2007). Two over-arching macro casino designs have been identified – the *playground* which corresponds to the form of casino design preferred by one consultant (Kranes 1995) and the *gaming* design, corresponding to the design prescription of a former casino manager (Friedman 2000). According to Kranes (1995), the challenge of casino design is to create legible spaces (i.e., where all design elements are recognizable) that are well ordered with familiar, pleasing and natural elements (e.g.,

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vegetation, water, sky design). Ceilings should be high with generous spacing among the structures within the casino. In contrast, Friedman (2000) identifies 13 principles of casino design that converge on the gambling equipment as the focus of the décor. Design features conforming to those principles include low ceilings and an absence of signage above machines that might draw the eye upwards, away from the machines. A *gaming* design casino would be divided into small, compact gambling areas with short, maze-like pathways.

We have identified two measures of emotional and cognitive effects that are impacted by environmental variations. At-risk gambling intentions (ARGIS) is a measure developed to gauge the extent to which individuals anticipate that they would gamble more money and spend more time than planned in a gambling situation (Finlay et al. 2006). Restoration (REST) is a cognitive state where the effects of mental fatigue are offset and there is an opportunity for attention mechanisms to replenish (Kaplan 1987). Gambling, such as playing slot machines, requires a high degree of directed attention that may lead to mental exhaustion. Repetitive decisions are necessary including those regarding the number of lines to play and the number of credits to bet per line. Expressions of mental fatigue include difficulty in directing attention to the task at hand and being "more likely to take risks, be impulsive and impatient" (Kaplan, Kaplan and Ryan 1998, p. 17). Restorative elements within an environment (e.g., a tropical beach onto which waves are lapping) will attract involuntary attention. The effect of restorative elements, therefore, is to interrupt the directed attention afforded to the monotonous task and refresh cognition.

The effects of several décor elements have been examined within each of the *gaming* and *playground* designs on emotional reactions and judgments about gambling behaviour. In one study, gamblers responded to video simulations of casino scenarios varying in lighting, colouring, design layout and sounds. Variations in décor elements determined how positively gamblers judged the scenario; moreover, those judgments were directly related to estimates of the likelihood of excessive gambling behaviour (Finlay, Marmurek, Kanetkar and Londerville 2010). The complex pattern of outcomes over our research program have suggested that although restoration and gambling intention are positively correlated in general, it is possible to introduce décor variations in specific casino designs to increase restoration without increasing excessive gambling intention or to introduce décor variations that decrease at-risk gambling intentions while increasing or not affecting restoration.

In the current research: we tested additional design variations that decrease at-risk gambling intentions and/or increase restoration; we implemented multiple methods of data collection and analysis that will yield (a) measures of the relative importance of décor variations on emotion and gambling behaviours (conjoint analysis), (b) provide richer descriptions of gamblers' reactions to the design manipulations and (focus groups), and (c) provide stronger ecological validity (testing in a virtual reality environment). This research program afforded convergent validation of the effects of casino design on gambling behaviour and the development of an innovative 360° virtual reality environment which provides capabilities for exploring décor interventions with the potential to reduce problem gambling.

2. Conjoint Study

In our previous research, respondents provided judgments about videos representing a single level of casino décor variation (e.g., flashing lights) within a single macro design (e.g., *playground*). A conjoint study was designed to identify combinatory effects of manipulations. Conjoint analysis yields indices of the comparative strengths of stimulus element variations when they occur in combination (Dahan and Srinivasan 2000). For conjoint analysis, choice alternatives are described by sets of attribute levels. Respondents rate stimuli varying in the constellation of the levels of specific attributes (e.g., one alternative might combine flashing lights, 30 km travelled to venue, *gaming* design; another alternative might combine static lights, 90 km travelled to the venue, *playground* design). This conjoint analysis indexes the relative importance of each attribute to ARGIS and REST.

2.1 Method

A full-profile conjoint design tested the following attributes: macro design (*playground* or *gaming*); sound (music or ambient casino noise); décor variations (flashing or static lights; monotone or varied colours; crowded or uncrowded venue; symmetrical or asymmetrical layout; chunking or random layout of machines by theme); and, distance travelled to casino (30 km or 90 km). Each factor had two levels except for décor which had 10 levels.

Participants (N=275) in the conjoint study were recruited by newspaper and by posting flyers in a community in Ontario, Canada. To be eligible, participants had to be at least 19 years of age, and had to have played slot machines within the past four months. Individuals participated in groups ranging from 3 to 15 participants with an average of 10 participants per session over a total of 27 sessions. Each participant was paid $30 for his or her time and assistance with the study.

Participants viewed 10 one-minute videos in one of eight random order sequences. Each video portrayed one of two macro designs (*playground* or *gaming*), one of two soundtracks (*music* or *ambient noise*), and one of two levels of one of 10 micro décor element variations. Videos were produced by professional videographers who edited 3-minute versions of the videos used in a previous study down to the one-minute versions required for the conjoint study. Each video opened with a depiction of a highway with a sign that indicated "Casino 30 km" or "Casino 90 km."A full factorial experimental design would have required 80 different venue combinations. Four replicates (sets of videos) with 10 stimuli per replicate (each participant viewed one of the four replicates of 10 videos) would provide comparable statistical efficiency (greater than 90%) to a full factorial design. Accordingly, 40 videos were selected to achieve the desired statistical efficiency

Participant groups were tested in a lab on campus using "Resolver Ballot" software and hardware to monitor and collect responses using handheld keypads, similar to a TV remote control. The Resolver Ballot software controlled the display of the survey questions, collection of keypad responses, and storage of data.

Participants were shown one practice video from a prior study before the 10 critical videos. Videos were projected on a screen at the front of the room. Participants were then asked to respond to ARGIS and REST items. After participants had watched each of the 10 videos, they responded to single questions measuring at-risk gambling intention and restoration as follows:

- ARGIS: "In this place, I would gamble….."
  scale from 1 to 7 where 1 = "about what I intended" and 7 = "much more than intended"
- REST: "I would feel refreshed in this place."
  scale from 1 to 7 where 1 = "totally disagree" and 7 = "totally agree"

2.2 Results

Consistent with previous findings, *playground* scored higher (M = 3.35, SD = 2.11) on ARGIS than *gaming* (M = 2.98, SD = 1.99) and higher (M = 4.25, SD = 1.88) in restoration than *gaming* (M = 3.52, SD = 1.82).

The conjoint analysis yielded coefficients which provide a measure of the relative importance of each of the tested attributes in explaining ARGIS and REST and thus, the priority in which attributes should be pursued for relevance in casino design to alleviate problem gambling. Macro casino design and sound had the largest effects in explaining ARGIS and REST. The *playground* design was associated with higher levels of both measures, consistent with previous research using more traditional single variable manipulations. Music (vs. ambient casino sound) had an enhanced impact, particularly on restoration. A shorter travel distance to a casino is associated with higher gambling intentions. The effect of only one micro décor element was significant: bright colours were associated with higher gambling intentions.

Table 1: *Importance coefficients of each independent variable for ARGIS and REST*

	Coefficient		Coding
Independent Variable	ARGIS	REST	
Macro Design	**-0.348**	**-0.540**	-1 = *playground*, 1 = *gaming*
Distance to casino	**-0.214**	-0.055	-1 = 30km, 1 = 90 km
Sound	**0.315**	**0.740**	-1 = ambient, 1 = music
Chunking	0.029	-0.097	-1 = not chunked, 1 = chunked
Colour	**0.211**	0.040	-1 = monotone, 1 = multiple colours
Lights	0.094	0.141	-1 = static, 1 = flashing
Symmetry	0.113	0.044	-1 = asymmetrical, 1 = symmetrical
Crowding	0.039	0.059	-1 = not crowded, 1 = crowded

Results in **bold** indicate $p < .05$.It was also found that distance and colour affected intention to gamble independently of any effects on restoration suggesting that intention to gamble is not mediated completely by restoration. Selective introduction of décor elements may reduce at-risk gambling while maintaining the restorative casino experience.

3. Focus Group Study

The goal of the focus group phase was to elicit richer descriptions of gamblers' reactions to the manipulations of the macro designs depicted in video representations of casinos. The focus groups provided introspections about how features of the video impacted judgments of gambling intention and restoration for individuals differentiated on the basis of gambling severity. Participants were paid $50.

3.1 Method

Thirty-two participants from the conjoint study accepted invitations to participate in the focus groups. Assignment to groups was based on scores from the Problem Gambling Severity Index (Ferris and Wynne 2001). Five focus groups were formed. The first group comprised non-problem gamblers (PGSI scale score of 0) and consisted of four females and four males. The other four focus groups were considered moderate to problem gamblers (PGSI score of 3 or more). Across those four groups there were 10 females and 14 males. Participants viewed four 3-minute videos that varied in macro design (*playground* vs. *gaming)* and in one of two levels of one of the five décor elements (lighting; crowding; colour; symmetry; chunking). The groups were asked to discuss what they had seen and to complete the mini-questionnaires assessing ARGIS and REST. The focus groups were audio and videotaped. Transcripts of the sessions were created from these tapes. NVivo software was used to code and analyze a variety of themes .

3.2 Results

Theme analysis revealed several differences between non-problem and at-risk groups. Comments about luck, gambling motivations, payoffs, gaming strategies, randomness and discussion of winnings were all highly popular themes within the at-risk groups (e.g., "the more expensive ones (slot machines) are supposed to pay out more, they're the higher paying ones", "I guess I believe they are random but I have no proof that they are random", "I also think they put certain machines near the entrance that will win frequently and it gets the flow going to that machine"). The most common themes in the non-problem group related to discussion of the atmosphere of the casino (i.e. lights, sky and sound in the casino) and included phrases such as "I think you

could concentrate more if the noise wouldn't be there", "I felt that the lighting for the most part felt very fluorescent", and "I like the sky look on the ceiling, very nice".

Word frequency analysis was preformed for the 150 most common words. Some words were expressed with similar frequency by participants in response to the *playground* or *gaming* videos. For example, those who viewed the *playground* casino designs verbalized 34 general references to "people", such as, "I knew the people at Grand River" and "there (aren't as) many young people". The word "machine" was also noted with similar frequency (38 times) in response to both *playground* and *gaming* videos, e.g., "I don't think I heard any machines going nuts" and "I saw a lot of machines that bored me". The words "loud" and "noise" or "noisy" were also mentioned after both *playground* and *gaming* videos with similar frequency (35 times) in comments such as, "I think it's really noisy" and "you can't help but notice when people win they are so noisy".

Word frequency analysis also indicated words that there were used more frequently in reaction to one or other of the macro designs. For example, words containing the stem "bright" (i.e., bright, brighter, brightest) were mentioned more frequently after viewing videos depicting the *playground* design (14 references compared with 6 references for videos with a *gaming* design).The word "atmosphere" appeared 7 times from those who had viewed a *playground* video and 3 times for the *gaming* videos. Upon inspection of these specific references, however, it appeared that the word was being used in a positive sense for the *playground* design and in a negative sense for the *gaming* design (e.g., "the atmosphere…was just horrendous").

The qualitative analysis of the focus group data indicate that participants noticed the pleasing décor of the *playground* design, such as high ceilings, sky designs and water features. In addition, participants notice micro décor elements in a video presentation of a gambling environment, such as the presence or absence of flashing lights and the crowdedness or relative spaciousness of gambling venues (detailed references can be obtained from the first author). More generally, the focus group data validated the use of videos in eliciting affective and evaluative reactions to video representations of casinos.

4. Virtual Reality Study

The primary goal of our research is to identify casino design and décor variations that enrich restorative experiences while lowering the likelihood of at-risk gambling. In the final study, two additional décor variations were hypothesized to influence restoration and at-risk gambling intentions: the presence of restorative images in the gambling venue, and the use of emotion-inducing landing strips (entranceways). An innovative Panoscope 360º virtual reality methodology was developed for the study to increase the ecological validity of casino representations in our research.

The choice of the restorative image décor variations for the final study follows Kaplan's (1987) identification of the benefit of "soft fascination" that emanates from scenarios such as a scene of waves lapping onto a beach with a single palm tree blowing in the wind. Images delivering soft fascination involuntarily attract attention. They tend to be familiar, easy to perceive and pleasant to view. Restorative images may provide a distraction from the directed attention and repetitive behaviour required when, for example, playing slot machines, much as natural images serve to restore cognitive capacity (Berman, Jonides and Kaplan 2008). The re-directive function of restorative images may remove a gambler from a trance-like state and thus re-establish a conscious attentive state. We tested three levels of restorative images: no restorative images as a control; images which positively deliver a high level of restoration; and, images which deliver a negative level of restoration. It was anticipated that restorative images introduced peripherally (at a 90º angle from the direction of sight within the 360º Panoscope) presented twice (for 20 seconds each time) during the viewing of a 3-minute video simulation of a casino environment might draw the attention of gamblers, thereby sufficiently distracting them from the gambling activity at hand to ground the rationality of decisions about their gambling behaviour.

Underhill (2004) refers to the entrance area (e.g. the entrance to a retail store or, by extension, the entrance to a casino) as a "landing strip" that triggers an orientation reaction: "You walk through any door and suddenly your brain has to take in a load of new information and process it so you will feel oriented" (Underhill 2004, p.48). Whatever lies in the transition zone between the outside and the inside of a venue is referred to as a landing strip. When a casino is not designed to ensure that there is a gentle, pleasurable transition between the outside world (the drive to a casino destination, the arrival from a hectic environment like the Las Vegas strip) to the inside environment of the casino, transition tension or anxiety may be induced before the gambler even consciously begins to perceive the casino floor. Those conditions of induced emotional tension may contribute to riskier decision-making (Starcke, Wolf, Markowitsch and Brand 2008) that may be harmful to the gambler.

Three levels of "landing strip" were tested in the panoscope study: a no landing strip control condition, a landing strip inducing pleasure (e.g., Wynn Restort, Las Vegas) and, in contrast, a landing strip inducing anxiety(e.g., Imperial Palace, Las Vegas). It was anticipated that the pleasure-inducing landing strip would positively orient gamblers to a gambling venue that induced pleasure and a positive restorative experience.

4.1 Method

The Panoscope study was conducted as a 2 x 3 x 3 between-subject design featuring two macro design (MD) levels (*gaming*, *playground*), three restorative image (RI) levels (none, positive restorative images, negative restorative images) and three landing strip (LS) levels (none, pleasure-inducing, anxiety-inducing).

The Panoscope features networked immersive displays where individuals are absorbed in a environment (12 feet in diameter) that surrounds them on a 360-degree basis. Video for the Panoscope is shot using a panoramic, 360-degree lens. The software accompanying the Panoscope (Flash Cut) permits video "panels" to be overlaid during the panoramic play of the video. Use of these panels creates a totally immersive, life-like experience and facilitates the delivery of the manipulations. The Panoscope 360 degree unit is acknowledged as a means of studying environmental effects in a setting as close to reality as possible when researchers had no means of doing so in an actual casino in Canada.

The goal of stimuli presentation in the 360º Panoscope was to provide an immersive reality experience (n= 445) in order to elicit and measure responses to various stimuli in casinos. Participants were recruited from our database of previous participants. They were asked to sit on a chair in the 360º Panoscope where they were shown an introductory video of a neutral environment (inside of an office) with an audio track that provided an overview of the virtual reality technology and that participants were free to turn around in the swivel chair while viewing the videos so they could see what was in front of them or what was behind them in the scenario. Participants were then instructed to imagine how they would feel if they were in the gambling venue they were about to view.

Three-minute videos of a casino setting were produced according to one of the 18 experimental conditions, defined by the 2 x 3 x 3 between-subject design. Each participant viewed one, after which a survey was completed on a laptop computer. The survey included several measures; this manuscript will focus on two key outcomes: At-Risk Gambling and Restoration, including Being Away, Fascination, Coherence and Compatibility components. (Korpela and Hartig 1996). Participants were paid $30 for their participation.

The interaction between type of LS and type of RI was examined. In general terms, it was expected that a landing strip that induced positive emotion would provide a smoother transition into a casino venue than would a landing strip that induced anxiety, particularly when that venue was designed to generate a high level of pleasure (*playground*). Positive restorative images were also expected to decrease ARGIS and increase REST, particularly in conditions where a pleasure-inducing landing strip eased the transition to a casino characterized by a high degree of pleasure (*playground*). Given

gambling differences due to gender (Finlay et al. 2010), this pattern of effects was expected to be more pronounced among females than among males.

4.2 Results

The effects of environmental variables (MD, LS, and RI) and GENDER were analyzed separately for each of the dependent measures (i.e., ARGIS, REST and its four components). Each of those analyses was conducted as a 2 x 3 x 3 x 2 (MD x LS x RI x GENDER) between-subjects ANOVA. Post-hoc contrasts were conducted.

The analysis of ARGIS yielded a significant four-way interaction among MD, LS, RI and GENDER, $F(1, 436) = 2.62$, $p = 04$, indicating that the interaction of LS and RI was qualified by gender and by MD (lower ARGI are preferable from a health policy perspective). The four LS x RI interactions broken out by MD and gender are depicted in Figure 1. The LS x RI interaction was only significant for females exposed to the *playground* design, $F(2, 104) = 2.43$, $p = .05$ (bottom right graph). When females were exposed to a *playground* design with no LS, ARGIS was the lowest with positive RI ($M = 1.99$, $SD = 0.96$). Positive RI, however, did not reduce ARGIS with either an anxiety- ($M = 3.40$, $SD = 1.72$) or a pleasure-inducing LS ($M = 3.24$, $SD = 1.65$). Among females exposed to the *playground* design and negative RI, ARGIS decreased progressively from when no LS was included ($M = 3.97$, $SD = 1.36$), to when an anxiety-inducing LS was included ($M = 3.42$, $SD = 1.30$), to when a pleasure-inducing LS was included ($M = 2.73$, $SD = 1.52$).

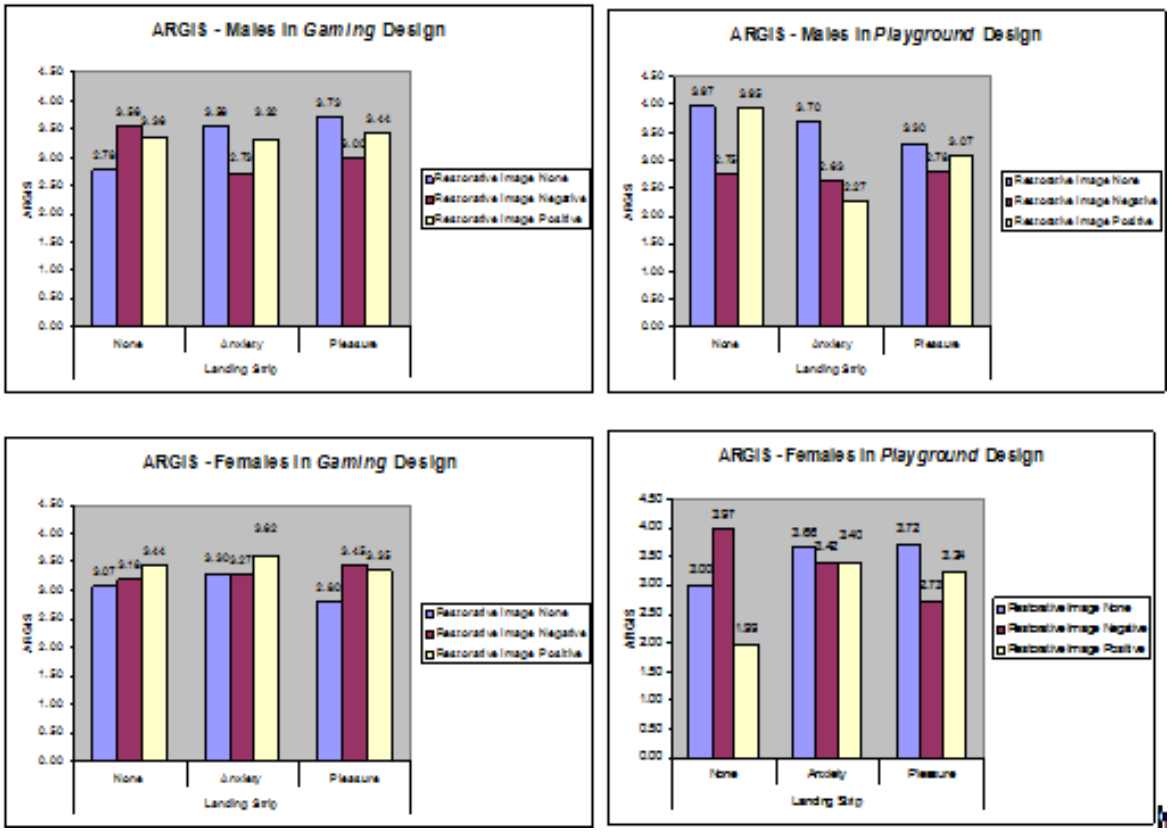

Figure 1: Interaction among LS, RI, MD and Gender on At-risk Gambling Intentions

While the LS x RI interaction among males exposed to the *playground* design was not reliable (top right graph, Figure 1), the main effect of RI was significant, $F(2, 92) = 3.82$, $p = 0.03$), no RI ($M = 3.66$, $SD = 1.42$), negative RI ($M = 2.71$, $SD = 1.70$), positive RI ($M = 3.14$, $SD = 1.41$). The lowest level of ARGIS for males in a *playground* MD, however, was with an anxiety-inducing LS and positive RI ($M = 2.27$, $SD = 1.06$). This ARGIS score was significantly lower than when positive RI were included alone

(no landing strip), (*M* = 3.95, *SD* = 1.22), *t*(31) = 3.29, *p* = 0.004. For males in a playground setting, the beneficial influence of positive restorative images (distraction from a trance-like state) appears to have been most intensely experienced in stark contrast to the initial emotion induced by an anxiety-inducing LS. When both females and males were exposed to the *gaming* design, there was no significant effect of LS, no significant effect of RI, and no interaction between LS and RI (bottom left and top left graphs respectively, Figure 1).

5. Discussion

Consistent with past findings, all three research methodologies confirmed that casino design affects ARGIS and REST experienced in a gambling setting. Given these and reported findings (Finlay et al., 2006; Finlay et al., 2007; Marmurek et al., 2007, Finlay et al., 2010), casino design should be ranked as having high effectiveness potential for problem gambling prevention. No longer is there a "lack of empirical evidence on this issue" (Williams, Best & Simpson, 2007, p. 38).

Macro casino design has a reliable effect on both ARGIS and REST. The *playground* design consistently scores higher on both of these variables. The inclusion of emotion-inducing landing strips prior to entering a casino and the presentation of restorative images during the gambling experience both have a differential impact on gambling intention. The original premise of the current research was therefore validated; casino design variables can be selected to impact variables differentially, decrease at-risk gambling; increase restoration).

For females, if no landing strip is included with a *playground* design, exposure to positive restorative images further reduces ARGIS When females were exposed to a *playground* design with no LS, ARGIS was the lowest with positive RI (*M* = 1.99, *SD* = 0.96). Positive RI, however, did not reduce ARGIS when either an anxiety- (*M* = 3.40, *SD* = 1.72) or a pleasure-inducing LS was included (*M* = 3.24, *SD* = 1.65). Among females exposed to the *playground* design and negative RI, ARGIS decreased progressively from when no LS was included (*M* = 3.97, *SD* = 1.36), to when an anxiety-inducing LS was included (*M* = 3.42, *SD* = 1.30), to when a pleasure-inducing LS was included (*M* = 2.73, *SD* = 1.52).

The added pleasure provided by exposure to restorative images for a *playground* casino design has no negative impact on gambling intentions when no landing strip is included. If a pleasure-inducing landing strip is added to a *playground* design for females, exposure to negative restorative images may provide a distraction that reduces gambling intentions. This finding was unexpected. Either a positively or a negatively restorative image can distract females and return them to a healthier cognitive state. While the LS x RI interaction among males exposed to the *playground* design was not reliable (top right graph in Figure 1 below), the main effect of RI was significant, *F* (2, 92) = 3.82, *p* = 0.03), no RI (*M* = 3.66, *SD* = 1.42), negative RI (*M* = 2.71, *SD* = 1.70), positive RI (*M* = 3.14, *SD* = 1.41). The lowest level of ARGIS for males in a *playground* MD, however, was recorded with an anxiety-inducing LS and positive RI (*M* = 2.27, *SD* = 1.06). This ARGIS score was significantly lower than when positive RI were included alone (no landing strip), (*M* = 3.95, *SD* = 1.22), *t*(31) = 3.29, *p* = 0.004. For males in a playground setting, the beneficial influence of positive restorative images (distraction from a trance-like state) appears to have been most intensely experienced in stark contrast to the initial emotion induced by an anxiety-inducing LS.

For males in a *playground* design, exposure to negative restorative images results in consistently lower at-risk gambling intentions, whether a landing strip (anxiety-inducing or pleasure-inducing) was included or not. At-risk gambling intentions were lowest for males in a *playground* design, however, with an anxiety-inducing landing strip and positive restorative images. For males in a *playground* setting, the beneficial influence of positive restorative images appears to have been most intensely experienced in stark contrast to the initial emotion induced by an anxiety-inducing landing strip. Overall, males respond well to exposure to restorative images (positive or negative) in

a *playground* macro design when a landing strip (pleasure- or anxiety-inducing) is included. For both males and females exposed to a *gaming* design, at-risk gambling intentions were not influenced by landing strip and restorative image interventions. Gambling interventions to reduce harm are contingent on macro, gender and micro design variables.

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