GAMBLING RESEARCH REVEALS

ALBERTA GAMBLING RESEARCH INSTITUTE

Risky Choice Biases: 7 Questions with Dr. Marcia Spetch

Dr. Marcia Spetch is a professor in the Department of Psychology at the University of Alberta in Edmonton, Alberta. She has received two research grants from the Institute (#S24 & #58) and recently provided answers to the following questions related to her research:

What is your academic background and how did you first become interested in research related to gambling and risk?

My academic background is in experimental Psychology, and my main area of research is comparative cognition. I am interested in understanding the behavioral and cognitive processes that allow animals, including humans, to learn and make important decisions. I became interested in research related to gambling several years ago when I found that pigeons sometimes are so attracted to signals for reward that in certain risky choice situations, they make suboptimal choices that cause them to reduce their overall rewards. It appeared that processes which usually result in optimal behavior can, in some situations, lead to maladaptive behavior. I wondered whether this might have implications for human gambling behavior.

Your gambling research has focused on risk sensitivity among individuals... what inspired you to investigate risk-sensitive decision making?

Dr. Elliot Ludvig, who was then a post-doctoral fellow in computing science, approached me to collaborate on comparative studies of risky choice. He suggested that we test whether the biases people show in risky choice (as demonstrated in the work of Nobel prize winner, Daniel Kahneman) would also be revealed in pigeons. The plan was to use the pigeon data to develop computational models of how biases arise in risky choice situations. However, we found that the pigeons responded very differently. Before attributing this to a species difference, we tested humans on a task similar to the one used

The primary aim of the Alberta Gambling Research Institute, a consortium of the Universities of Alberta, Calgary, and Lethbridge, is to support academic research related to gambling.

MISSION

To facilitate evidence-based broad research that informs gambling public policy and educates Albertans and the wider audience about the effects of gambling.

with the pigeons. We found that humans responded much like the pigeons and opposite to what we expected based on the literature. The difference between our study and many previous studies is that we required people to learn through experience instead of describing the outcomes and odds.

What experimental design did you use to test your decision-making hypotheses?

We directly compared how people chose when they learned about the outcomes from experience with how they chose when the outcomes and odds were described. For the experience-based choices people were presented with a pair of doors to choose from. By trial and error they learned what was behind each door. One type of choice was between a door that always led to a 20-point win and a risky door that paid double or nothing (i.e., 50/50 chance of winning 40 points). Another type of choice was between a door that always led to a small loss (-20) and a door that led to a risky loss (0 or -40). The same people were also given equivalent described choices (i.e., choose +20 or take a 50/50 gamble of 0 or +40).

Results of your research investigations have found that people make different choices for explicitly described probabilities than for experienced probabilistic outcomes. Why might this be?

When the choices were described, people were more risk seeking for losses than for gains, as previously found in the economic choice literature. But when the same choices were learned through experience, people showed the opposite pattern and became more risk seeking for gains than for losses. We think this is because choices based on experience are susceptible to memory biases. In particular, we hypothesized that people over-weight the most extreme outcomes (biggest win and biggest loss). Together with Chris Madan, we tested this hypothesis and found that people show biased memories that over-weight the extremes, and these biases are correlated with choice behavior.

In your experiment, was there any attempt to cue memory recall amongst participants?

In these experiments, we did not attempt to cue recall during the risky choice task. After the choice task we tested for memory recall by presenting a door and asking people to tell us which outcome first came to mind. This test provided evidence for the extreme-outcome bias because people more frequently reported the extreme outcome than the equally probable non-extreme one. We also asked people how often each outcome had occurred and we found that people overestimated the frequency of extreme outcomes. In future research it would be interesting to see if cueing recall during a gambling task would temper these memory biases.

What might be some real-world implications for differences between described vs. experienced outcomes with respect to decision making?

The implications are that how people choose in risky or gambling type situations depends on how they acquire the information regarding the choice. Ironically, people do not always make completely rational choices in either case. When the choice is described, people are susceptible to framing biases (e.g., whether the choice is framed as a win or a loss), but when the choice is based on past experience, people are susceptible to memory biases.

Do you have any "next steps" planned for this line of research investigation?

We have many next steps planned for this research. In one set of studies we are investigating the neural bases of described and experience-based risky choices using fMRI. In another set of studies we will investigate whether memory biases are exaggerated in people who frequently gamble.

The following scholarly publications provided additional information about Dr. Spetch's research investigations:

Ludvig, E. A., Madan, C. R., & Spetch, M. L. (in press). Extreme outcomes sway risky decisions from experience. *Journal of Behavioral Decision Making*.

Ludvig, E. A., & Spetch, M. L. (2011). *Of black swans and tossed coins: Is the description-experience gap in risky choice limited to rare event? PLoS ONE 6(6)*, e20262. http://dx.doi.org/10.1371/journal.pone.0020262

Institute Research Director Dr. Nady el-Guebaly

Institute-Funded Neuroscientists Establish Collaborative Linkages

Institute Research Director **Dr. Nady el-Guebaly** invited researchers from the Universities of Alberta, Calgary and Lethbridge studying the cognitive and neural mechanisms of gambling behaviour to meet in Calgary on June 8th, 2013 to discuss potential connections and collaborative opportunities.

Group discussion revolved around the following research ideas: approaches to understanding gambling, the relationship between gambling and other addictions, comorbidity with other problems and disorders, imaging techniques, animal models of gambling, tasks for assessing gambling, and how best to recruit problem gamblers. Also discussed were ways to facilitate interaction among researchers at each of the three universities and the benefits that could ensue from collaboration. Key meeting outcomes included specific proposals for facilitating collaboration and three proposed collaborative projects.

Attendees: Dr. David Euston, Neuroscience (Lethbridge); Dr. Bradley Goodyear, MRI Physicist (Calgary); Dr. Marcia Spetch, Psychology (Alberta); Dr. Matthew Tata, Neuroscience (Lethbridge); Eric Legge, PhD Student (Alberta); Catherine Laskowski, MSc Student (Lethbridge); Christopher Madan, PhD Student (Alberta). Unable to attend but interested in collaboration: Dr. Aaron Gruber, Neuroscience (Lethbridge).

Special thanks to Dr. Marcia Spetch for her involvement in meeting facilitation and reporting on outcomes.

AGRI Conference 2013 - Summaries of Selected Day 2 Presentations:

In early April, 2013, approximately 100 people from jurisdictions across Canada and around the world came together at The Banff Centre in Banff, Alberta to attend the Institute's 12th Annual Conference on Gambling Research. The theme of the conference was "Research to Practice in Gambling Disorders." The completed conference program and links to all speaker PowerPoint presentations are available on the Institute web site.

Prevention of Problem Gambling: A Review of the Evidence

– Dr. Robert Williams
(University of Lethbridge, Lethbridge, AB, Canada)

Dr. Robert Williams' conference presentation provided an all-encompassing worldview of educational initiatives and policy practices that have been adopted to prevent problem gambling. He cautioned conferences attendees that "Educational and informational initiatives related to gambling are much less impactful, however, than policy changes… which is well known to those who work in fields of public health." Referring to his detailed review of the available evidence[1], he concluded his talk with what he considered to be twelve best practices to prevent problem gambling.

Personalized Normative Feedback as a Brief Intervention for College Student Gambling

– Dr. Clayton Neighbors
(University of Houston, Houston, TX, USA)

In his presentation, **Dr. Clayton Neighbors** described the effectiveness of social influence in changing potentially problematic gambling behaviour among college students who have indicated some level of being at-risk. "The idea here is to catch [students] when they're just starting to be involved in behaviours that show a potential for future problems," said Neighbors. Neighbors' research has involved incorporating findings about the perceived norms of college student gamblers into a brief computerized intervention. "This idea of presenting students with their own norms is almost universal in the alcohol preventative literature," said Neighbors who is attempting to apply a similar approach to problem gambling prevention. Though early results from an evaluation of Neighbors' gambling intervention indicate mixed intervention effects, social identity was found to moderate effects on gambling frequency and expenditure.
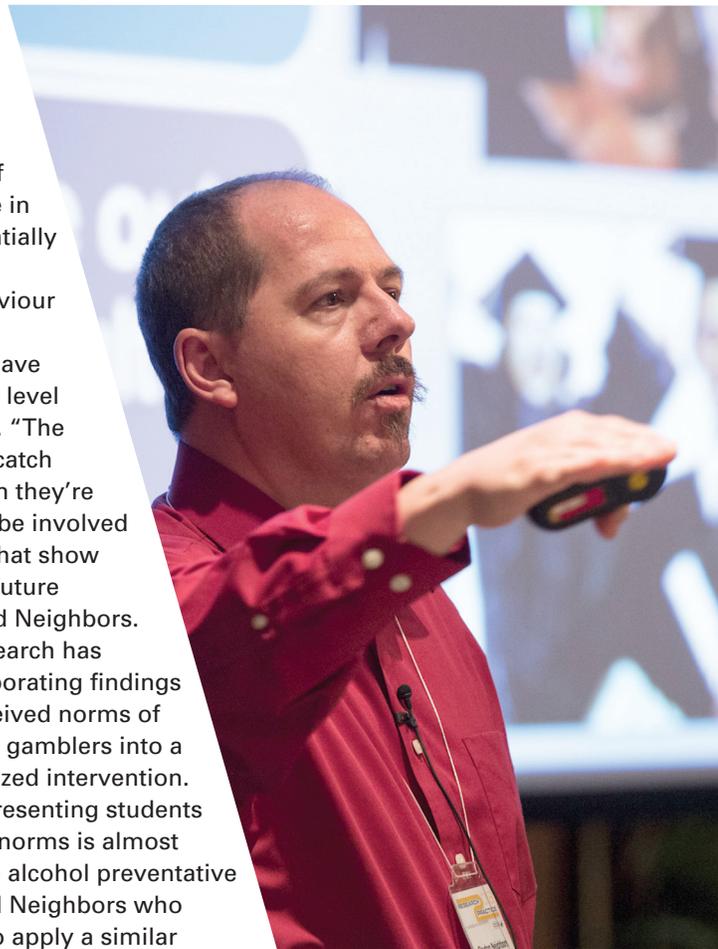
Pathological Gambling and the Space of Psychiatric Disorders

– Dr. Carlos Blanco
   (Columbia University, New York, NY, USA)

In his talk, **Dr. Blanco** stated that, "There has been a growing interest in where to classify psychiatric disorders… [classification] can give us ideas about treatment response and what's useful." Blanco's particular research interest has focused on the analysis of similarities between specific disorders. Part of this work involves the determination of where pathological gambling (pg) fits within an addictions nosology[2].

Data for Blanco's analyses have come from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). This sample is representative of U.S. adults (N=34,653) and contains diagnoses of 22 conditions. Blanco used factor analysis and other statistical techniques to develop a three-dimensional "map" of each disorder. The resultant "neighborhood" clusters on his map based on their relative distances from one another.

Findings from Blanco's investigation indicated that a limited number of dimensions explain the comorbidity of mental disorders. It also suggested that pg was clearly located close to other addictive disorders[3]. "The fact that gamblers often show signs of impulsivity, anxiety, depression and distress all seems to make sense as pathological gambling is in the neighborhood of other substance disorders but is not necessarily the same as them." This knowledge has implications for clinicians who treat these individuals. "For instance, if you have pg, it will not protect you from depression… in fact it will increase the risk," said Blanco. Likewise, disorders "close" to one-another on the map likely have similar risk factors and this knowledge can provide clues as to which treatments might be most beneficial.

The Brain and The Soul: Lessons from an Evidence-Based Treatment Centre

– Dr. Henrietta Bowden-Jones
   (National Problem Gambling Clinic, London, UK)

Dr. Bowden-Jones described her involvement in "the adventure" of setting up and developing the United Kingdom's first and only problem gambling treatment centre. The National Problem Gambling Clinic has grown rapidly since being founded in 2008. It currently receives in excess of 700 referrals per year for both group and individual treatment. Past cases provides a wealth of treatment information which are accessible from an in-house database containing over 2,000 referrals. This gambling data has been used by Bowden-Jones' team for various purposes – including the assessment of treatment success.

A particular strength of the clinic has been putting research into practice. "While giving a talk at a homeless facility I realized we didn't know anything about gambling and homelessness in the UK," said Bowden-Jones. The clinic subsequently undertook a homeless survey (n=468) and found "an incredibly high problem gambling prevalence rate and details of the types of gambling they were doing." Since that time, a treatment group for homeless people was created and has functioned extremely well. A next phase of the study is planned to be more "research-based" regarding data collection and causation. Research data has also been used at the clinic to improve day-to-day service delivery. For instance, waiting hours, DNA (did not attend) rates, discharges, and assessment appointments have all been improved based upon analysis of data. Bowden-Jones concluded by noting that, "Since this is the only gambling clinic in the UK, [we've] have more leeway to try different things."

Conference 2013 Attendee Feedback

Attendee evaluation forms indicated that the plenary sessions were well received in terms of clarity and relevance. Breakout sessions were found to be particularly valuable as they allowed attendees to select areas of interest and actively participate in these facilitated small-group discussions. Special thanks to those who provided their suggestions and ideas as this feedback is essential for the development of future Institute conferences.

1   *Prevention of Problem Gambling: A Comprehensive Review of the Evidence and Identified Best Practices (2012)* is available from <http://hdl.handle.net/10133/3121>.

2   Nosology is a branch of medicine that deals with classification of diseases.

3   Caution is warranted as data used to generate this finding was from a general population sample and not one which was gambling-specific.

2013-14 Scholarship Recipients

The Institute is pleased to announce the following 2013-14 Scholarship and Research Allowance Award Recipients:

• **Jennifer Arthur** (Psychology – PhD, Lethbridge)
• **Shadi Beshai** (Psychology – PhD, Calgary)
• **Sarah Farstad** (Clinical Psychology – PhD, Calgary)
• **Carrie Leonard** (Psychology – MA, Lethbridge)
• **Christopher Madan** (Psychology – PhD, Alberta)
• **Tanya Mudry** (Counselling Psychology, Education – PhD, Calgary)
• **Leanne Quigley** (Clinical Psychology – PhD, Calgary)
• **Victoria Suen** (Psychology – PhD, Alberta)
• **Jennifer Swan** (Psychology – MA, Calgary)
• **Ulric Wong** (Clinical Psychology – PhD, Calgary)
• **Igor Yakovenko** (Clinical Psychology – PhD, Calgary)
• **Gabriel Yanicki** (Anthropology – PhD, Alberta)

Descriptions of individual gambling-related research areas for scholarship recipients are available on the Institute web site.