

*Playing Against the Odds: The Role of Mood, Experience and Risk
in Decision-making*

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Thesis submitted to the
Faculty of Graduate and Postdoctoral Studies

In partial fulfillment of the requirements
for the PhD degree in Experimental Psychology

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ACKNOWLEDGMENTS

There are many individuals that have provided support and helpful feedback on this project over the years that I would like to thank:

Dr. Celine Blanchard – Thank you Celine for giving me the freedom as my supervisor to be myself and explore my academic passions. There were no guarantees as to how it would all turn out. Thank you for taking the jump and believing in the project with me. Your support, constructive critiques and guidance have been invaluable in making this dissertation the best that it can be.

My thesis committee: Dr. Pierre Mercier, Dr. Silvia Bonaccio and Dr. Sylvain Chartier.

Thank you to my committee for helping me hone and improve this project. Your feedback was invaluable during the design stage. Thank you also for your encouragement and enthusiasm and sharing my excitement to see where this would lead.

People that consulted on the project:

Dr. Denis Cousineau – Thank you for helping me perfect the statistics of the analyses. Your patience and guidance was very appreciated.

Dr. Pietre Hofstra – Thank you for consulting on the quantification of risk and decisions. Your math and poker knowledge was invaluable.

My Poker Savvy friends – Thank you for your endless hours of brainstorming with me – and listening to me think aloud and groan about not knowing how to measure this hobby we love.

Thank you also to the Ottawa poker community for taking part and spreading the word!

Last but not least: To Chris: You have been my rock and number one fan. Words can't express my thanks. You have encouraged me, supported me and reminded me often of why I was doing this. Thank you to my family and close friends. The support and encouragement over the years got me through and helped me to persevere despite obstacles. Words don't capture my appreciation.

ABSTRACT

Past research in decision-making has typically utilized hypothetical measures or simplified gambles to investigate the decisions people make. This method has been criticized as it lacks ecological validity and omits background knowledge and experience from the decision process. Mixed findings in the literature have emerged in terms of the effects positive and negative affect on risk-taking. The Affect Infusion Model (AIM) consolidates the mixed findings by incorporating factors that affect the extent to which affect is infused in the judgment process (i.e. experience). The current research examined the effects of mood on risk-taking in a decision task that allowed for background knowledge and experience; the game of poker. Three studies were conducted to test the predictions of the AIM using a novel methodology. Mood was manipulated in all three studies. **Study 1** found evidence of the moderating role of experience in the relationship between affect and risk-taking in a hypothetical poker decision task. The decisions of more experienced participants were less infused with affect than less experienced participants. **Study 2** replicated the findings of Study 1 in a real-time poker task conducted in a laboratory setting. **Study 3**, using a similar design to Study 2, introduced a task incentive and an additional condition that provided real-time odds/expected value information during the decision task. An unexpected finding emerged with respect to the moderating role of experience in the relationship between affect and risk-taking. With the introduction of a task incentive, the decisions of more experienced participants were more infused with affect than less experienced participants during the first 20 minutes of the task. Evidence of a main effect of Mood and Odds Information was also found. An additional Mood X Odds Information effect on risk-taking emerged for decisions early in the decision task. The results obtained in the present research program are discussed with respect to their novel contributions to the decision-making and risk-taking literature.

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CHAPTER ONE

GENERAL INTRODUCTION

We are bombarded with decisions on a daily basis from the simplest ones like choosing what clothes to wear on a given day to more complex decisions such as choosing one's career path. Often, decisions carry risk and consequences and we are called on to make choices with these risks and consequences in mind. According to early decision-making theory, when faced with decisions involving risk, individuals were expected to make optimal, rational decisions with the highest expected value that both maximize gains and minimize losses (Expected Value Theory; Edwards, 1954). Within this traditional framework, the probabilities of certain outcomes and their monetary values were known. As decision theory developed and evolved, research emerged suggesting that individuals often do not make optimal decisions based on the expected profitability of a choice option. The Expected Utility Model (EU) was developed in an attempt to remedy this discrepancy (Schoemaker, 1982). The EU model instead takes into account the worth or utility of each choice for the decision-maker as well as their personal preferences, rather than the expected monetary value of an option. Building on the EU model, the Subjective Expected Utility Model was developed to include a decision-maker's subjective probabilities of outcomes, as individuals vary in the likelihood of outcomes. Though an improvement upon early work in Expected Value Theory, decision-making theories such as the Expected Utility Model and Subjective Utility Model have been challenged in recent decades because of their inability to describe and predict what people actually do in decision-making situations (Camerer, 1981; Denes-Raj & Epstein, 1994). Additionally, research in decision-making involving risk has traditionally utilized "gambles" or simplified gambling tasks with limited choice options as

methodology (Lopes, 1983). This methodology has been criticized for its lack of ecological validity and application to naturalistic decision-making (Ranyard & Charleton, 2006). Moreover, background knowledge and experience has been largely omitted in the study of risk in decision-making, despite being an important factor in the daily decisions people make (Huber, 1997). In an attempt to remedy the shortcomings of past models, Prospect Theory was developed within the behavioural economics field (Kahneman & Tversky, 1979). The theory posits that individuals make decisions based on their potential value of losses and gains rather than on final outcomes. Prospect Theory was concerned with more naturalistic decisions, rather than optimal ones. The model also put forth the concept of loss aversion; that losses are felt more than gains and most individuals are essentially loss averse. However, individuals are not risk-averse in all situations. Thus, research in the psychological domain has begun to investigate what psychological factors influence both the propensity towards taking risks (risk-seeking) and aversion to risk (risk-aversion). One factor that has been implicated within this context is mood. In this project, we investigated the influence of mood on risk-taking in decision-making in a complex, decision task that allowed for background knowledge and experience. Three studies were conducted to investigate this relationship.

Mood and Risk-Taking in Decision-Making

There is a large body of literature investigating the relationship between mood and decision-making. Several studies have investigated this relationship within the context of simplified gambling tasks or hypothetical risk scenarios (e.g. Forgas, 1999; Isen & Patrick, 1983; Isen & Geva, 1987; Leith & Baumeister, 1996; Mittal and Ross, 1998; Yuen & Lee, 2003) in which the participant is asked to decide among options of varying risk after a mood induction procedure (MIP). Positive mood states are associated with enhanced problem-solving and can

lead to more flexible, creative and efficient decision-making (Isen, 2001). A variety of studies by Isen and colleagues (Isen, Means, Patrick & Nowicki, 1982; Isen & Patrick, 1983, Isen & Geva, 1987) have examined the relationship between mood and risk-taking. In their research, they have found that positive mood states are associated with aversions to high-risk situations. In one study (Isen & Patrick, 1983) participants were assigned to either a positive mood or neutral condition. Participants in the positive mood condition were given a gift certificate to induce positive mood, whereas in the neutral condition, participants were not given a gift. All participants were then given chips to bet in a roulette gambling task. They were told that the chips represented the value of their experimental credit for participating and that they were given the option to gamble with the chips and potentially lose them all (and thus lose their experimental credit) or win their experimental credit plus additional prizes for any additional chips won. The participants were assigned to a low, medium or high risk condition. Participants were told that they had either a 17% (low-risk), 50% (medium-risk) or 83% (high-risk) chance of winning. They found that those in the positive mood condition placed significantly more bets than those in the neutral condition when chances of winning were high. When chances of winning were low, those in the positive mood condition placed significantly less bets than controls.

Similarly, Isen and Geva (1987) found that positive affect induction was associated with an unwillingness to gamble unless there was a high likelihood of winning. In a methodology similar to Isen and Patrick (1983), participants were given chips to place bets in a roulette game. Study participants were assigned to either a positive (given a gift) or neutral (no gift) mood condition. Participants were asked to report the riskiest bet they would be willing to place prior to playing the game. In other words, participants were asked what the probability of winning would have to be in order for them to place a bet. The probabilities of winning ranged from 10%

to 100%. Those in the positive mood condition reported significantly higher minimum probabilities of winning (or lower risk) for placing a bet than did those in the control group. Additionally, participants were asked to record their thoughts during the game task and those in the positive condition reported significantly more thoughts related to losses when the stake was higher (more risky) than did those in the control group at similar stakes. The positive affect group appeared to be more concerned with possible loss than were those in the control group.

In contrast, negative mood states are associated with higher risk-taking in decisions, particularly when the payout is high (Leith & Baumeister, 1996). In an effort to investigate the links between negative mood, risk-taking and self-defeating behaviour, Leith and Baumeister (1996) conducted several studies; one study examined autobiographical narratives of the participant's lives in relation to actions which led to bad and good outcomes and the other study examined risk-taking in a simple gambling task. In the first study, participants were asked to recount, in written form, a situation in their lives in which their actions led to negative consequences and a situation that led to positive consequences. Participants were asked to specify what state they were in before, during and after the situation. Individuals were then asked to describe the role of their mood in each story that they recounted. The researchers found that riskier decisions and actions seemed to emerge from prior negative moods and distress. In the second study, participants were assigned to a positive, negative or neutral mood condition. Mood in the positive and neutral conditions were induced by having the participants watch a video clip. In the negative mood condition, participants were assigned to a task of singing a "corny" song in front of the researcher to induce embarrassment. All participants were then asked to take part in a gambling scenario task that involved choosing between two options. The scenarios were divided into a "safe" option that offered a 70% chance of winning a \$2 prize and a "riskier" option

involving a 4% chance of winning a \$25 prize. The safer option had a higher expectation than the riskier option (i.e. in the long run a person will win more money with the safer option). Results of this study revealed that those in the negative mood condition significantly chose the high-risk option over the low-risk option. Additionally, participants in the positive mood condition significantly chose the safer option over the riskier one. Those in the neutral condition were divided equally in their preferences. The authors replicated this study, but instead induced anger in the negative mood condition and made the riskier decision even more risky by having a 2% chance (versus 4%) of winning \$25. The results of the study were identical to those found in the second study.

Mano (1992) examined the relationship between mood and risk-taking in a sample of students. Both the valence characteristics (positive, negative) and level of arousal of the mood states were manipulated. After mood induction, all participants took part in a gambling scenario task in which a series of scenarios were given that presented different probabilities for winning for various lottery tickets at different prices. They found that those in the distressed mood condition (negative mood/high arousal) were willing to pay more for tickets at a greater risk (lower probability of winning) than were individual who were not distressed. Similarly, Mittal and Ross (1998) also found that following a mood induction, the participants in their study were more willing to take risks in the negative mood condition versus those in the positive condition. Chuang and Kung (2005) examined mood and risk-taking in daily living in a sample of MBA students. After mood induction, participants were asked to fill out a questionnaire assessing risk-taking in daily life situations. Results revealed that those in a negative mood had significantly higher risk-taking scores than those in a positive mood.

Collectively, the studies outlined above illustrate a propensity towards risk aversion when one is in a good mood and risk-seeking when one is in a negative mood. The rationale behind the high-risk aversion in positive mood states and preference towards high-risk/high payout situations in negative mood states is interpreted within a motivational framework of the mood maintenance/repair hypothesis, whereby individuals in positive mood states are motivated to maintain their good mood and in so doing they opt for low-risk situations (Isen & Geva, 1987). Individuals in negative mood states are motivated to repair their mood and as a result opt for higher payouts; however such payouts are often at a higher risk (Leith & Baumeister, 1996). Knowing that a loss will affect mood adversely, individuals in a positive mood state are motivated to avoid situations and scenarios that have a higher risk of loss. Instead, they are only willing to take risks when the odds are in their favour. On the other hand, individuals in a negative mood state are motivated to have a “big win”, knowing that this win will make them feel good. They are more willing to take the risk no matter how unlikely a win may be.

Inconsistent Findings in the Mood-Risk Taking Literature

Opposing findings have emerged in the decision-making and risk-taking literature. Research from an information processing framework predicts that those in positive mood states are more likely to take risks and those in negative mood states are more likely to avoid risk. The rationale being that those in positive mood states adopt a more heuristic-based mode of information processing, whereas in negative mood states individuals adopt a more systematic and methodical mode of processing. Those in positive mood states are better able to access positive cues related to risk judgments and tend to have more favourable thoughts in relation to risk outcomes, which ultimately increases their tendency toward risk (Forgas & Bower, 1987). However, those in a negative mood may perceive situations as more threatening and may make

decisions more vigilantly and systematically in an effort to avoid loss (Chou, Lee & Ho, 2007), resulting in an avoidance of risky situations. This is thought to be due to a mood priming effect in which positive or negative memories or cognitions previously associated with a mood state are primed and accessed when that mood state occurs again (Forgas, 1995). Others have suggested a “mood-as-information” framework (Schwarz & Clore, 1983) in which the mood itself serves as information reference points on which an individual makes a decision, and this decision is based on how they currently feel. A more recent “risk as feelings” framework (Loewenstein, Weber, Hsee & Welch (2001) speaks to the direct role of affect on behavior in which the cognitive evaluation of choice options are not imperative (as other information processing frameworks assume) and feelings themselves can determine behaviours and judgment outcomes directly. These general cognitive biases in information processing are dependent upon one’s mood state and can ultimately affect one’s judgment of risk. Some studies have provided support for the propensity toward risk-taking when in a positive mood and risk aversion in negative mood states (e.g. Chou, Lee & Ho, 2007; Forgas, 1999; Yuen & Lee, 2003). Forgas (1999) examined the effect of mood on making requests of others. In the first study, participants were asked how they would make requests in hypothetical social scenarios. The request options varied in their degree of riskiness (with indirect and polite requests being less risky and more direct and impolite requests being more risky). Participants were assigned to either a negative, positive or neutral mood condition. Those in the negative mood condition made significantly less risky requests than those in neutral or happy conditions. In the second study, participants were asked to make requests in a live task. Participants were again assigned to either a negative, positive or neutral mood condition. Those in the negative mood condition made significantly less impolite requests than those in the happy or neutral conditions. A study by Yuen and Lee (2003), using an

undergraduate student sample, examined the effect of mood on risk-taking in hypothetical forced-choice scenarios. Participants were randomly assigned to either a positive, negative or neutral mood condition. They found that those in the positive mood condition had higher risk-taking decision scores than those in either the neutral or negative mood conditions. Chou, Lee and Ho (2007) examined the effect of mood on risk-taking tendency in older adults in a hypothetical forced-choice scenario task. Study participants were assigned to either a positive, negative or neutral mood condition. Those in the positive mood condition had significantly higher risk-taking scores than those in neutral or negative conditions. Similarly, those in the neutral condition had significantly higher risk-taking scores than those in the negative mood condition.

The findings within the mood-maintenance hypothesis and information processing framework appear contradictory. One is suggesting that positive mood decreases risk-taking while the other suggests that it increases risk-taking. Similarly, one asserts that negative mood states increase risk-taking while the other predicts a decrease. To integrate these inconsistent findings, Forgas (1995, 1998) developed the Affect Infusion Model (AIM) in an attempt to illustrate how mood affects the way in which information is processed, recalled and evaluated. The AIM distinguishes between the functional aspects of mood states in information processing (i.e. moods serve as signals to process information either more heuristically or more systematically), motivational aspects of mood states (moods serve as motivations for action, i.e. mood repair/maintenance) and the effects of mood states on cognitive capacity (mood states can limit or enhance cognitive capacity). Affect infusion is a process in which emotion-laden information influences the judgment process and its outcomes (Forgas, 1995).

According to the AIM, the degree to which affect infusion occurs in the judgment process is on a continuum of four information processing strategies (from least influenced by affect to most): direct access processing, motivated processing, heuristic processing and substantive processing (Forgas, 1995). Direct access and motivated processing are low affect infusion strategies, whereas heuristic and substantive processing are high affect infusion strategies. Direct access processing is the least cognitively demanding of the four processing strategies and it involves reproducing a stored reaction to a situation one has encountered in the past. Thus, affect infusion in direct access processing is the least involved of the four processing strategies. It is most likely to occur when a target is well known and/or familiar and there are no substantial situational factors (i.e. cognitive, motivational, affective) encouraging elaborate information processing. Motivated processing involves targeted informational search strategies with a direct goal or outcome in mind (i.e. mood regulation/repair) and like direct access processing, involves little mood influence, though it is higher on the continuum of mood involvement. This type of processing is most likely to occur when a situation is personally relevant and/or an individual has a specific goal or motivation for an outcome and can be used to attain mood maintenance and/or repair. Heuristic processing assumes that a judge wishes to make a judgment using minimum cognitive effort and only a portion of available information. This type of processing is akin to mental “shortcuts” and is more likely to occur when a target of judgment is simple or very atypical, when a situation has low personal relevance or when one does not have past experience with a situation and/or a specific motivational goal in mind for an outcome. Affect, in heuristic processing, is assumed to influence judgment outside of an individual’s awareness, with moods often serving as indicators of how an individual feels about a target (i.e. mood-as-information). Substantive processing, or systematic processing, is the most elaborate and constructive

cognitive processing strategy on the continuum and is the most affected by mood. This strategy necessitates that the judge selects, learns and interprets new information about a target of judgment and compares it with pre-existing knowledge structures. It is more likely to occur when a task or situation is complex, when there is no specific motivational goal, and when there are situational demands that call for more elaborate processing. Substantive processing is usually only adopted when less elaborate processing strategies are inadequate to a task or a situation. Affect is thought to influence judgment via memory structures (i.e. affect-priming) that facilitate retrieval of cognitions previously experienced in related mood states. Thus, affect can indirectly impact judgment via constructive processes (i.e. memory retrieval, learning, and interpretation of novel information).

Within the AIM framework, an important factor in the degree to which mood affects information processing and ultimately risk-taking is the degree of information to be processed and the degree of familiarity with the target of judgment (i.e. gambling task) (Forgas, 1995). In other words, when one is familiar with the subject or target of judgment and thus the information to be processed is not as substantial or novel and can be accessed more readily, one is less affected by mood state in making a judgment or decision. Familiarity in this context is not merely alluding to prior exposure to a target of judgment, but rather having detailed and thorough information about the target (Forgas, 1995). When one is more familiar and experienced with the judgment target, it is more likely that low affect infusion strategies will be adopted (i.e. direct access and motivated processing). For example, those familiar with a task are motivated towards certain outcomes regardless of mood state and this guides the processing of information (Forgas, 1995). This suggests a need for more research in a decision-making context in which familiarity or experience with a task is possible. In other words, the influence of mood

on risk-taking needs to be studied within the context of a task or activity that allows for an accumulation of a priori skill or experience. To date, studies investigating risk-taking within the AIM framework have done so only with hypothetical risk-taking scenarios or measures.

Mood and Decision-Making in a Complex, Skilled Gambling Task: Texas Hold'Em Poker

Studies investigating mood and risk-taking have done so primarily with simplified gambling tasks (i.e. tasks which have two choices) or hypothetical risk scenarios in which the choices options are limited to a specified number and the parameters of the decision are often known. Researchers have questioned whether such methodologies are representative of the decisions individuals would make in real-world contexts (Huber, Wider & Huber, 1997; Klein, Orasanu, Calderwood & Zsombok, 1993; Larrick, 1993). Often the decisions we make are complex, with many factors to be considered, and choice options may be numerous. Additionally, not all parameters are known in many decisions and there are often uncertainties. Ranyard and Charlton (2006) proposed that methodologies utilizing simple gambles may not generalize to real-world decisions under uncertainty because they do not allow for the opportunity to invoke background knowledge. Will the predictions of the AIM be supported in the context of a more complex decision task with unknown parameters? It is my intention to examine the relationship between mood and task experience on decision-making in such a context. The game of poker is a game in which players must continually make decisions, often with many unknowns. Additionally, it is a game that is more skilled than other purely chance-based gambling activities (i.e. roulette), allowing for an accumulation of background knowledge and experience. Decision-making within this dynamic environment will be explored in the present research program.

The popularity of Texas Hold'Em poker has exploded world-wide in recent years. The cause of this trend is multi-faceted and may include such factors as increases in the number of

celebrities playing and endorsing the game, it being available to watch via television and the Internet, the ability to learn for free on online poker software sites, the availability of low stakes games online (e.g. penny stakes) and 24-hour access to Texas Hold'Em on online poker websites (Wood, Griffiths & Parke, 2007). Some professionals in the poker world attribute the sharp rise in the popularity of poker partly to the results of the 2003 World Series of Poker Championship Main Event¹ in which an amateur poker player named Chris Moneymaker won as well as the advent of “hole cams” at major televised poker tournaments (Murphy, 2009). Hole cams are video cameras affixed strategically to a poker table that allow spectators to see each players cards when the tournament is televised, making poker more of a “spectator” sport.

Texas Hold'Em poker is a gambling activity that has a large skill component to the game, unlike other gambling activities that are purely chance-based (i.e. roulette, slot machines, craps) (See Appendix A for a detailed description of the game of Texas Hold'Em). The complexity and strategy involved in the game has attracted many and has incited players to try to master its nuances. In order to be generally successful in poker on a long-term basis one must continually make good, informed decisions that minimize losses and maximize wins. Because of the chance aspects of the game, short-term fluctuations or variance can and will happen (i.e. hands that are large statistical favourites can sometimes lose), however it is expected that skill will overpower chance in the long run (Fiedler & Rock, 2009). The rationale being that skilled players will continuously get in game situations where they are a statistical favourite and will have gained experience in other aspects of the game that give them an “edge” over their more unskilled opponents. Fiedler and Rock (2009) have identified several skilled components of the game of

¹ The World Series of Poker Championship event is an annual poker tournament that was traditionally dominated and won by poker professionals. Since 2003, the number of entrants into the tournament has increased substantially annually and thus the prize for winning has increased substantially, with the majority of entrants now being amateur players (non-professionals).

poker; mathematical understanding, analytical intellectual power, attentiveness, memory, ability to make fast decisions, elimination of emotions from one's decisions, knowledge of game theoretical insights, strategic thinking, adaptiveness, enjoyment of continuous learning and the ability to self-control and self-monitor. Debates in recent years about whether poker is predominantly a game of skill or chance have taken place, particularly in the area of gaming law (see Kelly, Dhar & Verbiest, 2007 for a review).

Recently, some researchers have attempted to illustrate the skilled aspect of poker. DeDonno and Detterman (2008) conducted two studies investigating skill in poker. In the first study, participants were asked to play 200 hands of poker on a lab computer using computerized simulation poker game software. Most of the participants had little to no knowledge of the game. Participants were assigned to either an instructional condition or a control condition. In the instructional condition, participants were given information on poker strategy such as the benefits of playing fewer hands, the quality and ranks of hands pre-flop and the importance of paying attention to how other opponents play. Those in the control group were not given such instruction. The results revealed that those in the instructional group significantly outperformed those in the control group. In their second study, they asked participants to play for a longer period of time (720 hands) to allow for more time to practice game strategies. Participants were asked to play three two-hour game sessions using the same software used in Study 1. Participants were again assigned to an instructional condition or a control condition. Those in the instructional condition were given poker strategy information at multiple times throughout the playing sessions. The instructional strategy information included concepts such as the value of playing hands in later position, statistical probability and card "outs" (cards that can help make a hand) and pre/post-flop strategies. The results revealed that those in the instructional group

played significantly fewer hands and outperformed those in the control group. The authors noted that playing fewer hands and choosing higher quality hands is recommended by poker professionals.

Fiedler and Rock (2009) attempted to quantify skill in poker using online poker playing data on two online poker sites. The authors recorded real-money online play for 51,761 poker players playing at mid-level money stakes in No Limit Texas Hold'Em (i.e. \$1/\$2 - \$5/\$10 blinds). They noted that skill in poker is relative, in that one's skill is determined by the skill of one's opponents. They defined chance in poker as the standard deviation of the outcomes of poker hands. Skill was defined as anything that is not due to chance, or what remains of an outcome after infinite repetitions of a game. The authors attempted to identify at what point in repetitions (i.e. after how many hands) skill outweighs chance elements. A player's level of skill was calculated using relative expected values of players by determining their average win rates (average amount of big blinds won per hand) and the standard deviation of the hand outcomes. Through the analysis of actual hands played and hand outcomes, they concluded that skill does overcome the chance influences of the game in the long run in their sample of players. Those more skilled played more frequently (i.e. played longer, had more hands recorded) and had a higher average win rate than those with lower skill.

Expected Value and Optimal Decision-Making

Early researchers in decision making asserted that individuals will make rational, optimal decisions based on the variances and the expected value of choice options (i.e. Edwards, 1954; Coombs & Pruitt, 1960; Lichtenstein, 1965). This early research was often conducted by giving participants simple "gambles" (simple, limited option gambling tasks). Expected value is a mathematical concept in probability theory and statistics that originated in the 17th century. It

was used by mathematician Blaise Pascal in identifying optimal choices in sets of possible choice options. The expected value of a choice is calculated by multiplying the possible outcome values (i.e. monetary value) by their probability of occurring. Expected value can be negative (one will lose money in the long run with this option), positive (one will profit in the long run with this option) or zero (one will neither lose nor gain with this option but will break even). The choice with the highest expected value is then chosen as the rational and optimal choice.

Past studies have found that basic statistical concepts can be ignored in favour of more personally salient factors such as availability (Fiske & Taylor, 1991). In one study, researchers had participants attempt to draw red jelly beans out of bowls of white jelly beans (Denes-Raj & Epstein, 1994). Participants were given a choice over multiple trials to attempt to draw from a small bowl that contained 1 red jelly bean and nine white jelly beans or a larger bowl that contained 100 jelly beans with the amount of red jelly beans varying from 5 – 9 (depending on the trial). For every red jelly bean drawn the participant won \$1. The odds of winning were explicitly available for the participants to see for each bowl. They found that participants drew from the larger bowl (5-9% to win) significantly more than the smaller bowl, despite worse winning odds than those offered when drawing from the smaller bowl (10%). The participants reported that although they knew the odds were better with the smaller bowl, they had a “feeling” that they had a better chance of winning from the larger bowl because of the larger number of red jelly beans.

Research has illustrated that expected value is often a poor predictor of the choices that individuals make (Lichtenstein, Slovik & Zink, 1969). Indeed, more recent research has illustrated that statistical knowledge or knowledge of risk or odds in gambling scenarios often do not predict gambling outcomes (i.e. wagering), with many continuing to gamble despite

knowingly having the odds stacked against them in purely chance-based gambling activities (i.e. lottery, roulette, craps) (Steenbergh, Whelan, Meyers, May & Floyd, 2004; Delfabbro, Lahn & Grabosky, 2006; Ranyard & Charlton, 2006; Williams & Connolly, 2006). Chance-based gambling activities typically made available in casinos and state/provincial lotteries are designed in such a way that the “house” or lottery corporation have the odds in their favor. Thus, continuous participation in such activities involves likely long-term losses for individuals. However, within the context of poker, individuals may find themselves in numerous situations that can have a positive expected value, a negative expected value or zero expectation. For example, a poker player may decide to make a risky call that has a negative expected value (i.e. low likelihood of winning the hand, paired with an insufficiently sized possible payout). A play with a negative expectation is, by definition, risky, whereas a play with a positive expectation is considered lower risk and profitable in the long-run (See Appendix B for a detailed explanation of expected value as it relates to the game of poker). Might an individual make more optimal decisions if expected value information is displayed during a decision task? Few studies have investigated this possibility. In an early study, Montgomery and Adelbratt (1982) conducted three experiments using undergraduate samples. In all three experiments, participants were presented with sets of gambles and asked to choose the gamble they would prefer to play. The concept of expected value was then explained to them and they were then presented with the sets of gambles again with the expected value of each gamble displayed clearly beside the options. They were then able to change their preference if they chose to do so or stick to their original choices. The third experiment differed from the first two in that it gave the option for repeated gambles rather than a single play or gamble. The authors found that the expected value information had only a marginal effect on the participant’s choices. However, when repeated

gambles were allowed, rather than just a single play, participants were more willing to base their choices on expected value information. In a more recent study, Samanez-Larkin, Wagner and Knutson (2011) gave both younger and older adults a financial decision-making task in which they were asked to make investments in virtual stock options. During decision trials, each participant was given a choice between two investment options and told to choose which one they preferred. A computer randomly selected a 'good' stock and a 'bad' stock to be included in each decision. Their total earnings were tallied at the end of the trials. In Study 1, no expected value information was displayed alongside the choice options. Results revealed that younger adults made significantly better or more optimal decisions than older adults. In Study 2, another sample of young and older adults was given the identical decision task given in Study 1. The results again showed that younger participants outperformed older participants. However, the participants in Study 2 also did a second set of trials with expected value information displayed alongside each stock option. They found that both younger and older adult's experienced improved decision-making, with both groups making significantly more optimal decisions. Additionally, there was no difference between the age groups in terms of performance. Thus, the addition of expected value information had significantly aided the sample in making more optimal decisions. In the context of poker, it is expected that providing real-time odds and expected value information during game play will aid players in making more optimal and consequently less risky decisions.

The Present Research

The first goal of the present research was to examine decision-making under uncertainty in a complex, decision environment that allows for background knowledge and experience. The objective was to examine decision-making in a context akin to naturalistic decision-making

(Raynard & Charlton, 2006). The second goal was to examine the direct influence of mood on risk-taking in such a context. Studies investigating mood and risk-taking in decision-making have done so by using either simplified “gambles” or hypothetical risk-taking measures or scenarios. By investigating decision-making in a more complex and naturalistic context, we sought to expand upon past methodology in the mood and risk-taking domain. The third goal of the present research was to test the AIM framework within a context that has opportunities for past experience. Poker experience was assessed in order to explore its moderating role in the relationship between mood and risk-taking in decision-making. It is expected that the more experience one has with the decision-making task, the less likely it is that mood will influence or be “infused” in decision-making process. What might affect infusion look like in terms statistical results? If decisions were infused with affect, a significant positive or negative relationship between affect and risk-taking is expected. Similarly, if decisions were not infused with affect, there would be no significant relationship between affect and risk-taking. The fourth goal was to examine decision-making when one is given explicit real-time statistics/knowledge of risk information (i.e. odds, expected value information). Previous research has illustrated that individuals often ignore such information when taking part in decision tasks, while other research suggests that it aids decision-making. This research program investigated whether providing real-time odds/expected value information decreased risk-taking in decisions. Three experimental studies were conducted to address the above goals.

CHAPTER TWO

STUDY 1

The first aim of Study 1 was to investigate decision-making in a task that allows for background knowledge and experience. The second aim was to examine the direct effects of mood on risk-taking in such a decision context. Past studies have found significant group differences in risk-taking across mood induction conditions in decision tasks (Chou, Lee & Ho, 2007; Forgas, 1999; Isen & Patrick, 1983; Isen & Geva, 1987; Leith & Baumeister, 1996; Mittal & Ross, 1998; Yuen & Lee, 2003). The third aim of this study was to provide preliminary support for the AIM's prediction that the decisions of experienced judges will be less infused with affect than those less experienced. The following specific hypotheses were tested in the current study:

- 1) There will be significant differences in both Chance and Poker Risk-Taking in decision-making across mood conditions.
- 2) Experience will moderate the relationship between affect and Poker Risk-Taking. The decisions of more experienced players will be less influenced by affect than those with less experience.

Method

Participants. This sample ($N = 448$) consisted of predominantly male (97.9%) poker players aged 14 to 65 ($M = 27.81$, $SD = 8.57$). Participants were recruited from online poker-interest message boards and forums (See Appendix C for recruitment text) and were asked to take part in an online study examining decision-making in poker players. The countries of residence of study participants spanned 52 countries with the majority residing in either Canada

(14.8%), United States (51.9%), United Kingdom (8.3%), Netherlands (2.5%) or Australia (3%). Slightly more than half (54.9%) identified as single, 21% reported being in a relationship, 15.9% reported being married, 4% reported being in a common-law relationship and 3% reported being widowed or divorced. Sample participants were predominantly Caucasian (83.1%) and the majority had reported at least some college/university (75.8%). Approximately 10% ($n = 54$) of participants identified themselves as professional poker players, while the remainder reported working full-time (34.3%), part-time (8.1%), or identified themselves as a student (27.3%) or unemployed (15.3%). Approximately half of participants reported yearly incomes between 10,000 – 49,999 USD (52.3%), 18.6% of the sample reported incomes between 50,000 – 99,999 USD and 15.2% reported incomes 100,000 USD and higher.

This sample is fairly experienced with 32% reporting having played poker for more than 5 years and 59.5% reporting having played for 1-5 years. Only 6.6% reported having played for under a year. Similarly, 72.7% reported playing poker everyday or almost every day, 22.9% reported playing once or twice a week and the remainder (3.6%) reported playing every couple of weeks or less. Most participants reported “always” playing for real money (85.6%), with less than 1% reporting “never” playing for real money. The most popular forms of poker played in the current sample was No-Limit Texas Hold’Em (99.2% of participants reported having played it), followed by Omaha (88.6%), Limit Texas Hold’Em (82.2%), Omaha (Hi-Lo) (69.9%), Seven-Card Stud (67.8%) and Razz (61.7%). Lastly, the vast majority reported “Online” as where they play most often (93.6%).

Measures.

Demographics and Poker Play Preferences. A series of questions related to demographic information were created for the purposes of the present study. The questions relate

to age, gender, income, work status, marital status and race/ethnicity. Additionally, several questions were asked in reference to their poker play preferences such as where they play most frequently, the types of games played, the stakes they typically play and where they have played in the past.

Poker Experience. An 8-item scale developed for the present study that assesses poker experience. Participants were asked questions related to how long they have played poker, how often they play and their degree of study or mastery of the game. See Appendix S for the full scale. This scale showed good reliability with an alpha of .70.

Positive and Negative Affect. Current mood was measured using a modified Visual Analog Scale (VAS) adapted for online survey administration. Participants were asked the degree to which they currently feel *happy, calm, sad, frustrated, bored and tired*. Similar VAS has been used in other mood induction studies (i.e. Birch et al., 2004; Grant, Stewart & Birch, 2007). Participants were asked to provide the degree to which they are currently feeling the listed mood states. Each online adapted VAS consisted of a horizontal line of circular clickable buttons that connect to an anchor on either end (*not at all* and *very*). They were asked to click on the horizontal line where they feel they fall on the line with regard to the specified mood state. The clickable buttons were not numbered in ascension for the participant (i.e. each clickable button did not have a number beside it) to make it more applicable to a pencil and paper VAS. Fifteen clickable buttons were available to give more variability with respect to mood for the modified VAS. Positive Affect was computed by averaging the scores for *happy* and *calm* and Negative Affect was computed by averaging the scores for *sad* and *frustrated*.

Mood Regulation. To measure an individual's ability to regulate their mood, an 11-item scale (Lischetzke & Eid, 2003) was utilized. Eight items assessed negative mood repair (e.g., “It

is easy for me to improve my bad mood'') and three items assessed positive mood maintenance (e.g. 'It is easy for me to maintain my good mood for a long time'). Response options were on a 4-point Likert scale (ranging from *almost never* to *almost always*). Items were summed to create an overall Mood Regulation score. Higher scores indicate better mood regulation. This scale showed good reliability in the current study, with an alpha of .84.

Decision-Making Assessment. Decision-making was assessed using two scales that determined the degree of risk within decisions: Chance Risk and Poker Risk. Chance Risk was assessed using a scale developed by Kim and Kanfer (2009). This scale presents ten dilemma-choice problems that have been adapted from problems used in other decision research (Hsee & Weber, 1999; Kahneman & Tversky, 1979; Li & Fang, 2004; Mancini & Gangemi, 2004). Respondents were given decision scenarios and asked to rate the degree to which they would commit to the options given on a 7-point scale (from *Definitely choose A* to *Definitely choose B*). Each item has two options given. Six items were framed with respect to a potential gain and four were framed with respect to a potential loss. An example of a gain-framed question is 'In a roll of a single die, which option would you choose?'. The answer options are: 'A: A \$30 payoff if the die lands on 6.' and 'B: A \$5 payoff if the die lands on 1 through 5'. An example of a loss-framed question is 'You are given \$1000. Which option would you choose?'. The answer options are: 'A: Losing \$500 for sure.' and 'B: 50% chance of losing \$1000'. Both options in each item offer identical expected values, but differ in their probability of occurring. The lower probability options are considered higher risk. All responses are summed to create an overall risk-taking score. Kim and Kanfer (2009) reported an acceptable level of reliability for this scale. Four items with low item-total correlations, with the remaining six item scores averaged to create a Chance Risk score. Cronbach's alpha for this scale was .60 in the present study, an acceptable level of

reliability for newly developed scales with fewer than ten items (Loewenthal, 1996). Please see Appendix S for this full scale.

Poker Risk was measured using the Poker Risk Scenario Scale designed for the purposes of this study. This scale was adapted from poker scenarios given in Harrington and Robertie (2006). This 10-item scale presented ten poker scenarios that contain a degree of risk. Respondents were asked what they would do in the scenarios listed. Participants were presented with a pictorial display of the poker scenario with a text explanation of the scenario below the picture. An item example is ‘You are playing in a cash game. Player 1 makes the minimum raise to \$4 before the flop. Player 2 calls for \$4. You have Ace ♦, 8 ♦. What do you do?’ Participants were given four answer options to choose from for each item. Answer options increase consecutively in their level of risk. To prevent response order effects, some items presented answer options in descending order of risk. In all items, the option ‘Push all-in’ was the riskiest choice. The answer options for the above item example are *Fold*, *Call \$2,000*, *Raise to \$6,000* and *Push all-in*. Please see Appendix S for this full scale.

Procedure and Materials. This study was conducted online using Psych Data online survey software. Psych Data allows for randomization into experimental groups. It does this by randomizing the survey that participants are directed to once they have provided consent to take part in the survey. Potential participants were provided a link to the study on various poker-related message boards (i.e. 2+2, Pocket Fives) and were then directed to an informed consent page (See Appendix D for the informed consent text). This software then randomly assigned them to either a Positive ($n = 157$), Neutral ($n = 129$) or Negative ($n = 162$) mood induction condition. Mood induction was employed by providing participants with a short text passage of a positive, negative or neutral nature. As a cover for the true intention of the text passage,

participants were told that they would be quizzed after the text passage on their memory of the content of the passage. Participants were asked simple, filler questions on the content of the passage. Online mood induction has been utilized in recent research (i.e. Goritz, 2007; Verheyen & Goritz, 2009). Short text passages have successfully induced the desired mood (Verheyen & Goritz, 2009). Despite potential drawbacks of online mood induction as compared to in-person lab studies (i.e. less control of participant's immediate environment), online mood induction is a viable option for researchers (Verheyen & Goritz, 2009). Advantages of an online methodology include more heterogeneous samples, time and cost effectiveness, the ability for participants to take part at their own leisure in the comfort of their own surroundings and lower potential for demand effects (Verheyen & Goritz, 2009).

After providing consent online (clicking button that says 'I have read the above informed consent and agree to proceed with the survey'), participants were directed to fill out measures assessing Baseline Positive and Negative Affect and Mood Regulation. Participants were then directed to the mood induction text that they were randomly assigned to (See Appendix J for the mood induction texts). The mood induction texts were identical to those used in Verheyen and Goritz, (2009) with the exception of the negative condition text. An English version of the negative text was not available and thus an alternative text was chosen. Three negative texts were piloted in a 10-person focus group. One text was chosen by nine of ten focus group respondents as the most negative affect inducing. This was the negative text chosen for the present study.

The positive mood text consisted of a short, humorous passage about a university professor that teaches his students about the important things in life (365 words). The negative text consisted of a news story outlining the death of a young boy that had committed suicide due to chronic bullying (678 words). The neutral text consisted of a modified excerpt of the first

chapter of Stephen Hawking's *The Illustrated A Brief History of Time* that described the human perspective of the cosmos from ancient times to present day (593 words). After the mood induction was complete, participants were directed to fill out their current mood again after filling out post-induction mood levels, participants were directed to complete the two risk-taking scales; Chance Risk Scale followed by the Poker Risk Scenario Scale. Participants were then given the remaining scales for Demographics, Poker Play Preferences and Poker Experience. Lastly, participants were directed to a debriefing page (See Appendix E for the debriefing text).

Results

Data Screening. A total of 951 individuals “clicked” on the link to fill out the online survey (329 in the positive condition, 314 in the negative condition and 308 in the neutral condition). Those that filled out 0-50% of the survey and/or those that did not complete the decision tasks were removed as non-completers. After removing non-responders, a total of 530 participants remained (177 in the positive condition, 181 in the negative condition and 172 in the neutral condition), indicating a total response rate of 56%. All participants were asked after completing the decision tasks “Did you read the text passage?” Answer options were *Yes*, *Most of it*, *Some of it*, and *No*. To ensure the integrity of both the mood manipulation procedure and any potential results, only those that answered *Yes* or *Most of it* were retained for further analyses. The number of participants removed from the positive, negative and neutral conditions were 19, 17 and 41 respectively.

To investigate whether those that read their assigned text passage differed from those that had not read their assigned text passage, independent samples *t*-tests were performed in each condition. Results revealed that those that had read the positive text ($M = 2.87$, $SD = .51$) had significantly higher mood regulation scores than those that had not read the text ($M = 2.56$, $SD =$

.62); $t(164) = -2.46, p = .015$. In the negative condition, those that had not read the text ($M = 1.96, SD = .32$) had significantly higher Poker Risk-Taking scores than those that had read the text ($M = 1.73, SD = .35$); $t(179) = 2.61, p = .01$. Lastly, in the neutral condition, those that did not read the text had marginally higher Poker Risk-Taking scores [$M = 1.88, SD = .51; t(170) = 2.53, p = .051$] and significantly higher baseline negative affect [$M = 4.07, SD = 1.99; t(169) = 2.1, p = .037$] than those that had read the text passage (Poker Risk-Taking, $M = 1.71, SD = .32$; baseline negative affect, $M = 3.31, SD = 2.10$). Additionally, those that had not read the text, had marginally lower baseline positive affect [$M = 6.72, SD = 1.80; t(169) = -1.85, p = .067$] and significantly lower mood regulation scores [$M = 2.67, SD = .44; t(169) = -2.40, p = .017$] than those that had read the text passage (baseline positive affect, $M = 7.25, SD = 1.55$; mood regulation, $M = 2.88, SD = .48$). One possible explanation for non-readership, particularly in the neutral group (as evidenced by 41 non-readers), may be their poorer baseline affect and mood regulation. Those in poorer moods may be less compliant and less motivated to read a long, dry text - or text of any length for that matter.

Skewness and kurtosis values for all variables of interest were examined in SPSS. All values were within reasonable bounds (between -1 and 1). Baseline positive and negative affect levels were slightly skewed with skewness values of -.85 and .68 respectively. This is consistent with previous online mood research (Goritz, 2007), as baseline mood of online respondents tend to be more positive than those brought in a lab. Evidence for univariate outliers was examined in the variables of interest. One outlier was identified with respect to Poker Experience, with a z-score of -4.47 (1.5 *SD* away from nearest neighbour). This individual was removed from future analyses. Four cases were identified as multivariate outliers through Mahalanobis distance with $p < .001$. These four cases were removed. A total of 448 respondents were included in subsequent

analyses (157 in the positive condition, 162 in the negative condition and 129 in the neutral condition).

Validity of Mood Induction. To determine the effectiveness of the mood induction procedures a one-way ANOVA and paired sample *t*-tests were performed.² A one-way ANOVA was performed to test whether there were significant group differences in positive and negative affect both before and after the mood induction. As expected, no group differences were found at baseline for either positive affect, $F(2, 439) = 1.02, p = .36$, or negative affect, $F(2, 439) = 2.16, p = .12$, indicating that randomization of participants was successful. There were group differences with respect to post-manipulation positive affect, $F(2, 440) = 27.80, p < .001$, and negative affect, $F(2, 440) = 29.87, p < .001$. Tukey post-hoc comparisons of the three groups indicate that those in the negative mood condition ($M = 4.70, 95\% \text{ CI } [4.34, 5.06]$) had significantly higher post-manipulation negative affect than those in the positive condition ($M = 3.14, 95\% \text{ CI } [2.80, 3.48]$), $p < .001$ and neutral condition ($M = 3.00, 95\% \text{ CI } [2.69, 3.32]$), $p < .001$. There was no difference in post-manipulation negative affect between the positive and neutral conditions, $p = .85$. Similarly, those in the negative condition ($M = 5.97, 95\% \text{ CI } [5.71, 6.23]$) had significantly lower post-manipulation positive affect than those in the positive condition ($M = 7.22, 95\% \text{ CI } [6.95, 7.48]$), $p < .001$ and neutral condition ($M = 7.13, 95\% \text{ CI } [6.85, 7.40]$), $p < .001$. Again, there was no difference in post-manipulation positive affect between the positive and neutral conditions, $p = .88$.

To investigate whether positive and negative affect increased or decreased in the desired direction, paired-sample *t*-tests were performed in each condition. The results of these analyses and effect sizes of the mean mood difference are depicted in Table 1. As shown, positive and

² The measures for positive and negative affect showed good external validity as illustrated in a significant relationship with mood regulation (see Table 3).

Table 1
Paired Sample t Tests of Mean Differences Between Pre and Post Mood Induction Affect Scores by Condition

Affect Type	M difference	SD	t^a	d
Positive Mood Condition (n = 157)				
Positive Affect	-.20*	1.06	-2.36	.19
Negative Affect	.62**	1.32	5.94	.47
Negative Mood Condition (n = 162)				
Positive Affect	1.25**	1.57	10.18	.80
Negative Affect	-1.29**	2.28	-7.22	.57
Neutral Mood Condition (n = 129)				
Positive Affect	.11	.87	1.47	.13
Negative Affect	.32**	1.24	2.95	.26

^a Positive condition, $df = 156$; Negative condition, $df = 161$; Neutral condition, $df = 127$.

* $p < .05$ ** $p < .001$

negative affect changed significantly in the desired directions in the positive mood condition, indicating that the positive mood induction was effective. However, as illustrated by Cohen's d values, there was only a modest effect on positive affect. The positive text exerted a larger effect on reducing negative affect, than inducing positive affect. In the negative mood condition, positive and negative affect increased and decreased in the desired directions. According to Cohen's d values, the negative mood induction had larger effects on affect than did the positive mood induction. These results are in line with the group effect on affect found only in the negative mood condition and are consistent with past mood research online (i.e. Goritz, 2007; Verheyen & Goritz, 2009) and in lab settings (Gasper, 2004; Westerman, Spies, Stahl, & Hesse, 1996). It is notoriously difficult to induce positive affect in experimental research to a large degree because of a ceiling effect, with most having high baseline levels of positive affect (Diener & Diener, 1996). Additionally, negative stimuli have consistently exerted a stronger

emotional response across a variety of contexts than do positive stimuli (see Baumeister, Bratslavsky, Finkenauer & Vohs, 2001). Thus, it is hardly surprising that the negative mood induction in the present study has illustrated a stronger effect than the positive mood induction.

As expected, no differences were found between pre and post-manipulation positive affect in the neutral mood condition. Contrary to expectations, the text passage in the neutral mood condition significantly decreased negative affect, although the effect was small. One explanation of this may be that reading a more complex, neutral text such as a historical account of a scientific theory, provided a distraction, thereby unintentionally reducing negative affect. Past research has shown that distracting tasks can reduce levels of negative affect (Blagden & Craske, 1996; Nolen-Hoeksema & Morrow, 1993). In particular, effortful, cognitive tasks have been found to be most effective in distracting individuals from their negative moods (Erber & Tesser, 1992; Morrow & Nolen-Hoeksema, 1990). To encourage compliance with the reading task, participants were told prior to reading the text that their memory would be tested on the content of the text passage. Supporting the idea that reading the neutral text may have been a more cognitively effortful activity than the positive and negative text, a one-way ANOVA revealed a significant difference in number of content questions answered correctly across conditions, $F(2, 440) = 40.81, p < .001$. Tukey post-hoc comparisons revealed that those in the neutral condition ($M = 2.27, 95\% \text{ CI } [2.13, 2.40]$), had significantly fewer correct content answers than those in the positive ($M = 2.84, 95\% \text{ CI } [2.77, 2.90]$), $p < .001$, and negative mood conditions ($M = 2.73, 95\% \text{ CI } [2.65, 2.80]$), $p < .001$. The number of correct answers did not differ between the positive and negative conditions, $p = .19$.

Table 2
Descriptive Statistics for Experienced vs. Less Experienced Players and Results of Independent Sample t Test

Variable	Experienced ^a		Less Experienced ^b		<i>t</i> (297)
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Baseline NA	3.25	2.01	3.81	2.15	2.35*
Baseline PA	7.39	1.54	6.87	1.76	-2.73**
Mood Regulation	2.95	.49	2.83	.49	-2.16*
Chance Risk-taking	3.87	1.15	3.52	1.03	-2.81**
Poker Risk-Taking	1.65	.31	1.79	.34	3.82***

Note: NA = negative affect; PA = positive affect

^a *n* = 148 ; ^b *n* = 152, * *p* < .05 ***p* < .01 ****p* < .001

Preliminary Analyses.

Characteristics of Experienced vs. Less Experienced Players. Preliminary analyses were performed to examine any differences between experienced players and their less experienced counterparts among variables of interest (See Table 2). Experience scores were ranked in tertiles according to experience level scores. The top third experience level was compared to the bottom third on variables by utilizing independent sample *t*-tests. Results revealed those with more experience had significantly higher baseline positive affect, mood regulation and Chance Risk-taking scores than those with less experience. Additionally, those with more experience had significantly lower baseline negative affect and Poker Risk-Taking scores than those with less experience.

Bivariate Relations. Preliminary relationships among variables of interest in the current study at the bivariate level are depicted in Table 3.³ Bivariate relationships between the affect

³ In the current analyses and subsequent analyses involving multiple testing in all three studies, an adjustment for multiple comparisons was not applied. Our rationale for not applying a conservative correction such as Bonferroni includes: utilizing novel methodology for assessing risk in decision-making, utilizing newly developed measures to assess risk-taking in a more naturalistic decision task and the exploratory nature of the three studies. Indeed, Bender and Lange (2001) caution that applying adjustments for family-wise error in exploratory studies may not be appropriate and risks increasing Type 2 error, and thus masks interesting lines of inquiry for future research. They suggest that corrections are most appropriate in confirmatory studies.

Table 3
Descriptives and Zero-Order Correlation Matrix of Affect, Experience, Mood Regulation and Risk-Taking for Each Condition

Measure	1	2	3	4	5	6	<i>M</i>	<i>SD</i>
Positive Condition								
1. Post PA	-	-.62**	.06	.54**	.12	-.15 [†]	7.23	1.67
2. Post NA		-	-.15 [†]	-.50**	-.11	.02	3.13	2.15
3. Experience			-	.13	.20*	-.20*	3.19	.42
4. Mood Regulation				-	-.01	-.05	2.90	.51
5. Chance Risk					-	-.02	3.67	1.11
6. Poker Risk						-	1.73	.32
Negative Condition								
1. Post PA	-	-.57**	.07	.33**	-.08	-.11	5.95	1.67
2. Post NA		-	-.10	-.19*	.03	.09	4.72	2.30
3. Experience			-	.02	.17*	-.23**	3.21	.40
4. Mood Regulation				-	-.06	.05	2.86	.49
5. Chance Risk					-	-.04	3.75	1.14
6. Poker Risk						-	1.71	.32
Neutral Condition								
1. Post PA	-	-.42**	.28**	.36**	-.01	-.04	7.14	1.55
2. Post NA		-	-.18*	-.21*	-.07	.12	2.99	1.80
3. Experience			-	.18*	.15 [†]	-.15 [†]	3.28	.39
4. Mood Regulation				-	.09	-.02	2.88	.48
5. Chance Risk					-	.17 [†]	3.78	1.15
6. Poker Risk						-	1.71	.32

Note. PA = Positive Affect; NA = Negative Affect.

** $p < .01$, * $p < .05$, [†] $p < .10$

and risk variables were first explored. In the positive condition, higher post-manipulation positive affect was marginally associated with less Poker Risk-Taking. Affect was unrelated to either type of risk in all three conditions. Because poker experience was related to both types of risk-taking in all three conditions, partial correlations between affect and risk-taking were performed after controlling for poker experience. Table 4 presents the associations between

Table 4
Partial Correlations between Affect and Risk-Taking for Each Condition after Controlling for Poker Experience

Affect Type	Positive		Negative		Neutral	
	Chance	Poker	Chance	Poker	Chance	Poker
Post PA	.10	-.16 [†]	-.09	-.09	-.05	.00
Post NA	-.08	-.01	.05	.07	-.06	.12

Note. PA = Positive Affect; NA = Negative Affect; Chance = Chance Risk-Taking; Poker = Poker Risk-Taking.

[†] = $p < .10$

affect and risk-taking after removing the effects of poker experience. The associations between affect and risk-taking did not change in any condition after controlling for poker experience.

More poker-related experience was significantly associated with less Poker Risk-taking in all three conditions (marginally so in the neutral condition). Interestingly, more poker experience was related to more Chance Risk-taking in all conditions (marginally so in the neutral condition). Perhaps more experienced players recognized that the chance-based options for each scenario were equal with respect to expected value in the long run and thus were more willing to take the risk and receive a larger payout? Another possibility is that more experienced players have higher incomes or play for higher stakes, and subsequently may go for higher payouts in general. In the Chance Risk scale, the higher payouts were deemed more risky as they carried more uncertainty. To explore these possibilities, experience was correlated with reported income and stakes played in both cash games and tournaments. More experience was significantly associated with higher income, $r(441) = .17, p < .001$, and higher stakes played in cash games, $r(445) = .19, p < .001$, and tournaments, $r(433) = .30, p < .001$. Thus, more experienced players may have felt more comfortable and willing to take chances, while recognizing that the expected value of the answer options was identical.

Investigating Group Differences in Decision-Making. To test Hypothesis 1, a one-way, between subjects ANOVA was performed with Chance and Poker Risk-Taking entered as dependent variables. No group differences were found in either Chance, $F(2, 446) = .32, p = .73$, or Poker Risk-Taking, $F(2, 446) = .42, p = .66$.

The Interaction of Affect and Experience in Decision-Making. The AIM predicts that information processing (which precedes decision-making and ultimately risk-taking) with respect to an unfamiliar, complex task will be more infused with affect than tasks that are familiar and not complex. To test Hypothesis 2, six separate hierarchical multiple regressions (two in each condition) were performed to investigate the interactive effect of experience and affect on poker risk-taking in a poker scenario decision task. The results of these analyses are presented in Table 5. Positive and negative affect are highly correlated variables, as evidenced in Table 3, and their effects on risk-taking were examined in separate analyses. In the first regression model (Model 1), post-induction negative affect and poker experience were entered in the first step and their interaction term was entered in the second step.⁴ This analysis was repeated in each condition. Prior to computing the interaction terms, both variables were centered by subtracting the subject's raw scores on these variables from their mean score (West, Aiken & Krull, 1996). In Model 1, poker experience was a significant predictor of poker risk-taking in the positive and negative conditions. However the first step was only marginally significant in the positive mood condition. No significant interaction was found in either the positive or negative conditions. In the neutral group, a significant post-induction negative affect X poker experience was found. The interaction accounted for 4% of the variance in poker risk-taking. The total variance accounted for in this model was 8%. To better understand this interaction, poker experience was

⁴ Baseline affect was included in models in initial analyses and did not contribute significantly to the models. It was not used in subsequent analyses.

Table 5
Hierarchical Regression of Affect, Poker Experience and their Interaction on Poker Risk-Taking by Condition

Predictor	Positive			Negative			Neutral		
	ΔR^2	<i>B</i>	95% CI	ΔR^2	<i>B</i>	95% CI	ΔR^2	<i>B</i>	95% CI
Model 1									
Step 1	.05*			.04*			.03		
NA		-.00	[-0.24, 0.22]		.07	[-0.01, 0.03]		.02	[-0.01, 0.05]
Experience		-.16*	[-0.28,-0.05]		-.17*	[-0.26,-0.02]		-.10	[-0.25, 0.04]
Step 2	.01			.00			.05*		
NA x Experience		.04	[-0.02, 0.10]	.	-.01	[-0.06, 0.04]		-.09*	[-0.16,-0.02]
Total R^2	.06			.04 [†]			.08**		
Model 2									
Step 1	.06**			.04*			.02		
PA		-.02	[-0.05,0.01]		-.02	[-0.05, 0.01]		-.00	[-0.04, 0.04]
Experience		-.16**	[-0.28,-0.05]		-.14*	[-0.26,-0.01]		-.12	[-0.27, 0.03]
Step 2	.01			.00			.01		
PA x Experience		-.04	[-0.11, 0.03]		-.02	[-0.09, 0.05]		.05	[-0.03, 0.13]
Total R^2	.07*			.04 [†]			.05		
<i>n</i>	157			162			129		

Note. PA = Positive Affect; NA = Negative Affect.

** $p < .01$, * $p < .05$, [†] $p < .10$

dichotomized into high and low by splitting this variable into +1 and -1 SDs from the mean (West, Aiken & Krull, 1996). This relationship is depicted in Figure 1. As shown, it appears that risk-taking scores change little as a function of negative affect in those with a high degree of poker experience. Conversely, negative affect appears to be positively related to risk-taking in those with low poker experience. To explore the significance of the individual slopes in this relationship, simple slopes tests were performed using ModProbe (Hayes & Mathes, 2009). ModProbe is a macro used in conjunction with SPSS statistical software to assist in further exploration of interactions in ordinary least squares and logistic regression. Results of the simple slopes test revealed that the slope for those low in experience was significantly different from

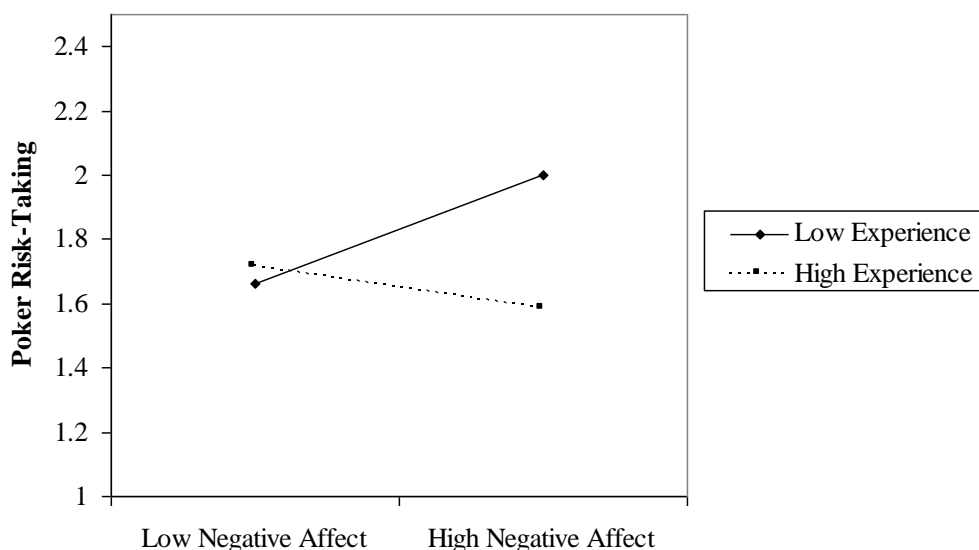


Figure 1. Graphical depiction of the interaction of negative affect and experience on poker risk-taking in the Neutral condition.

zero ($b = .05, p < .01$). The slope was not significantly different from zero for those high in poker experience ($b = -.02, p = .42$).

In Model 2, post-induction positive affect and poker experience were entered in the first step and their interaction term was entered in the second step. Again, variables were centered prior to computing the interaction term and the analysis was repeated in each condition. A significant, negative, main effect of experience was found in Model 2 in the positive and in the negative conditions. No significant main effects emerged in the neutral condition. The interactive effect of positive affect and experience on risk-taking was not significant in any of the mood conditions.

Discussion

The results of this study partially supported the main hypotheses. It was hypothesized that the degree of risk-taking in the decision-making tasks would significantly differ across mood conditions. Evidence to support Hypothesis 1 was not found in the current study. These results

ran counter to previous research in the mood and risk-taking domain (Chou, Lee & Ho, 2007; Forgas, 1999; Isen & Patrick, 1983; Isen & Geva, 1987; Leith & Baumeister, 1996; Mittal & Ross, 1998; Yuen & Lee, 2003). This study provided encouraging preliminary support for the second hypothesis. By providing a hypothetical decision task that allowed participants to invoke their background knowledge, we were able to test the prediction that the decisions of more experienced players would illustrate less affect infusion than those less experienced. The results are in line with the predictions of the AIM and suggest that more experienced players utilized a low affect infusion strategy. Interestingly, a positive relationship between negative affect and poker risk-taking was found in those with less experience. This runs counter to the AIM's prediction that those experiencing negative affect will have more deliberate and substantive information processing, resulting in lower risk-taking. Rather, results that support the findings in the MMH framework emerged. Indeed, at the bivariate level, all associations found between affect and risk-taking were consistent with the predictions of the MMH; positive affect was associated with less risk-taking and negative affect was associated with more risk-taking. The present results provide a preliminary test of our hypotheses. Albeit interesting, the design presents limits that are worth addressing. First, the online nature of the methodology may have presented confounds with respect to the decision task. For example, it cannot be verified that participants did not partake in mood affecting activities (i.e. watching television, listening to music) during the decision task. Second, it is not known whether the findings from hypothetical decision tasks translate to live decision-making. In order to gain confidence in the present results and expand upon a hypothetical decision task, these hypotheses were tested in the context of a more naturalistic, real-time decision task in a separate study.

CHAPTER THREE

STUDY 2

The first aim of Study 2 was to examine decision-making in a more naturalistic, real-time decision task that allowed for background knowledge and experience. The second aim of the current study was to examine the direct effects of mood on risk-taking in the context of a live decision task. Indices of risk in the current study were defined primarily within the context of the expected value of decisions during game play. Third, the current investigation sought to examine whether the decisions of more experienced players were less infused with affect than the decisions of their less experienced counterparts during an actual poker playing session. Thus, a goal of the current study was to examine whether the findings of Study 1, in support of the AIM, could be replicated in Study 2. Specific hypotheses in the current study were as follows:

- 1) There will be significant differences in risk-taking in decision-making across mood conditions.
- 2) Experience will moderate the relationship between affect and the risk-taking during play. The decisions of more experienced players will be less influenced by affect than those with less experience.

Method

Participants. This sample consisted of 83 university students (79.5% male) that play poker (individuals that have played for at least 6 months and/or more than 10 times). Each participant was randomly assigned to one of three mood conditions; Neutral ($n = 27$), Positive ($n = 29$) and Negative ($n = 27$). Participants were recruited from the University of Ottawa campus through recruitment flyers posted around campus (See Appendix *F* to view this flyer) and for

course credit in introductory psychology classes through the Integrated System of Participation in Research (See Appendix G for the recruitment text for course credit). All potential participants were told that they would be entered in a prize draw to win a 6-month subscription to Poker Virtual Trainer (valued at \$200), an online poker training and learning website and forum. Prior to taking part in the study, all potential participants were asked whether they had sought medical/psychological assistance for a gambling problem in the past; any that answered that they had were not invited to participate in the study. More than half of the sample (54.4%) reported being in the first year of their degree program and ranged in age from 17 to 47 years old ($M = 20.7$, $SD = 4.27$). The sample was fairly heterogeneous with approximately 55% of individuals identifying as Caucasian and the remainder of participants identifying as Arabic/West Asian (7.2%), South Asian (8.4%), Latin American (4.8%), Black (2.8%), Japanese (2.4%), Chinese (8.4%), and Filipino (1.2%) and of mixed origin (4.8%). The majority of participants identified as single (60.2%) or in a relationship (30.1%).

Most participants reported playing poker for 1-5 years (60.2%), with the remaining playing for more than five years (26.5%) and under a year (13.3%). The large majority of participants (88%) had played poker online before in some capacity. Participants reported playing poker most often online (41%) or at someone's house (51.8%), with most playing at least once every couple of weeks (67.5%). The most popular forms of poker played were No-Limit Texas Hold 'Em (95.2%), Limit Texas Hold 'Em (88%) and 5-Card Draw (44.6%). Only 15.7% of players reported never playing poker for real money before, with the remainder reporting that they play poker for money at least sometimes. Of those that play poker for real money, players on average spend \$232.66 in buy-ins at poker tournaments and/or ring games online and/or at live games. This average does not take into account wins and losses.

Measures. Participants were asked to fill out a series of scales identical to those listed in Study 1 (See Appendix S to view these measures). All constructs (Demographics and Poker Play Preferences, Poker Experience, Mood Regulation) were assessed identically with the exception of affect and risk-taking (described below). In addition, Task Performance was included in the current study.

Positive and Negative Affect. Current mood states were measured using visual analog scales (VAS) to assess the degree to which respondents were *happy, calm, sad, frustrated, bored, and tired*. Participants were asked to provide the extent to which they are currently feeling the above mood states. Each VAS consisted of a horizontal line (100 mm long) that connects to an anchor on either end (*not at all* and *very*). They were asked to place a tick on the horizontal line where they felt they fall on the scale with regard to the specified mood state. Each scale was scored as distance in millimetres from the left anchor (*not at all*). Due to a methodological error, only Sadness and Happiness was measured for the first 30 participants. Thus, Sadness and Happiness were used in the present study to assess positive and negative affect. Happiness and Sadness were measured at four time points during the lab session: at baseline (Time 1), post mood induction (Time 2), after 20 minutes of poker play (Time 3) and after 50 minutes of poker play (Time 4; at end of playing session).

Decision-Making Assessment. Decision-making was assessed by determining the degree to which a player takes risks during game play. Risk-taking was assessed both pre-flop and post-flop (Please see Appendix A for a definition of these terms). *Pre-Flop Risk-Taking* measurements consisted of the percentage of negative expected value hands played voluntarily out of all negative EV hands dealt for a session (% Neg. EV Preflop). Play is considered more

risky the higher this percentage becomes.⁵ A negative expected value pre-flop indicates that these hands are of low value (i.e. a Jack and a Two). A low value hand has a low likelihood of winning in any given hand, thus if an individual chooses to play more low value hands they are playing riskier and are often losing chips needlessly. It is also more difficult to make decisions with lower value hands (i.e. A Ten and a Six) as even if you hit the flop and make a pair (i.e. a pair of 10s), it can be difficult to ascertain whether this hand is best at the table. Additionally, the more hands an individual plays the greater the likelihood of making a blunder or bad decision while playing. Playing a hand is defined as voluntarily putting money in the pot pre-flop. When a player posts a blind, this is not considered voluntary. It is only considered voluntary in a blind position when the small-blind puts in enough money to match the big-blind or a larger raise from an opponent (calls) or the person themselves makes a raise. It is also voluntary when the big-blind has put more money in the pot than the posted blind by either calling a raise or raising themselves. Pokerroom.com is an online poker website that has accumulated statistics on the expected values of pre-flop hands from millions and millions of real-money hands played on their online poker software site. This online database was publicly available and was used to determine the pre-flop expected value of hands played. This EV took into account the number of players at the table and the individual's position at the table. Each hand that was dealt to an individual was coded as either "1" positive EV, "0" negative EV or "2" neutral EV. The number of Negative EV hands played voluntarily were then summed across the playing session and divided by the number of negative EV hands dealt to calculate a Pre-Flop Negative EV Score for each participant.

⁵ This statistic is similar to the commonly used poker statistic VPIP (percentage of hands where one voluntarily puts money in pot), however only voluntarily played negative EV hands were used in the calculation. It is common knowledge that a high VPIP in general (barring certain situations and skill levels) equates to riskier play.

Post-Flop Risk-Taking was measured in two ways. First, the number of negative EV decisions or blunders across the playing session was assessed (Post-flop Risk A). Negative EV decisions post-flop entail making decisions while playing in which you commit chips to the pot voluntarily when you do not have odds to do so. Essentially, one is making a risky play that doesn't provide a sufficient return in order to make the play profitable in the long run. The general idea is that the more blunders or mistakes one makes, the greater the potential for losses, and thus the riskier one is playing. For all post-flop decisions, the expected value of decisions was determined by comparing the ratios of pot odds to win odds. Please refer to Appendix B for a detailed review of determining pot odds, win odds and expected value in poker. Win odds were determined using a manual odds calculator in Hold'Em Indicator software. Hold'Em Indicator is a software that provides instant, real-time pot odds while a person plays online poker. It displays the EV of each hand dealt pre-flop, pot odds (pre and post-flop) and odds of hitting hands (i.e. flush, straight) post-flop. Within this software, there is a manual win odds calculator. Please see Appendix K for a screenshot of this manual calculator. The win odds in Hold'Em Indicator are based on several factors: the cards dealt to an individual, the cards on the board, the number of individuals left in the hand, the number of individuals that previously folded, the combined odds of getting cards by the river that can improve one's hand, the total probability of your opponents having certain hands by the river (i.e. flush, straight). The win odds are thus calculated using a proprietary, complex algorithm utilizing all of these factors.⁶ After comparing pot-odds to win odds for each post-flop decision, an expected value score was given for each decision made. A negative expected value decision was coded as "0", a positive expected value decision was coded

⁶ The range of hands that one can put a given opponent on is important when calculating the potential win odds and expected value of a decision. In the present study, it was not possible to know what range of hands a participant put their opponents on, thus opponents hands are left unknown and random when calculating win odds in Hold'Em Indicator.

as “1” and a zero or neutral expected value decision was coded as “2”. Actions such as checking or folding have zero expectation. This process was conducted identically for all flop, turn and river decisions. The percentage of decisions made with a negative expected value was determined by dividing the number of negative expected value decisions made by the total number hands dealt to calculate a Post-Flop Negative EV Score across the playing session.

The second way Post-Flop Risk-Taking (Post-Flop Risk B) was measured was to assess the total number of decisions a player made across the session. A higher number of decisions implies several things: 1) those making more decisions are playing more hands, 2) those making more decisions are more heavily involved in the hands they play (may be involved in more decisions on each street i.e. raises/reraises) and those making more decisions may stay in hands longer (i.e. may see river or go to showdown more). Being highly involved in too many hands is inherently risky, as mentioned previously. Additionally, staying in a hand longer often implies (i.e. to the river or showdown) more commitment of chips to a pot and you need a strong hand that can hold up in a show down against other players to see a profitable return. Thus, going to too many showdowns with too many hands carries risk if hands are not particularly strong. Lastly, the more decisions one makes, the more potential there is for mistakes or blunders. The total number of decisions were summed and divided by the total number of hands dealt to give a Total Decisions Score across the playing session.

Task Performance. Performance in the poker task was measured two ways; *Chip Profit* and *Win/Loss Score*. Chip Profit for a playing session was calculated using Poker Tracker, a computer program that analyzes hand histories. Poker Tracker determines the amount of profit a player has earned for a given session from their buy-ins, wins and losses. Win/Loss Score was a more explanatory measure of how a session went in terms of wins and losses. For example, an

individual could win many large pots in the last five minutes of a playing session and end up profiting a fair amount; however, this does not give information on the proportion of wins vs. losses in the session, nor does it give information on the magnitude of those wins and losses. One's Win/Loss Score takes into account both the proportion of wins vs. losses in a given session, as well as the magnitude of those wins and losses. Win/Loss Score was computed by recoding all wins and losses in a session according to their magnitude. A small win or loss was determined by losing or winning between 0 and 10 big blinds (0 – 10,000 chips) and was coded as "1"; a medium win or loss was determined by winning or losing between 10 and 40 big blinds (10,001 – 40,000 chips) and was coded as "2"; and a large win or loss was determined by winning or losing more than 40 big blinds (40,001 and up) and was coded as "3". A Total Win Score was determined by summing all coded win amounts across the session. A Total Loss Score was created using the same method. The total Win/Loss Score was created by subtracting the Total Loss Score from the Total Win Score. Thus, high Total Win/Loss Scores indicate a larger proportion of wins to losses and/or larger win magnitudes than loss magnitudes.

Procedure and Materials. Participants were brought to a lab on campus and asked to read and sign an informed consent document (See Appendix H for the informed consent text). Participants were then asked to fill out a number of measures assessing poker experience, demographics, poker play preferences, mood regulation and positive and negative affect. Each participant was randomly assigned to either a positive mood induction, a negative mood induction or a control condition), with the intent of experimentally inducing either positive affect (i.e. happiness, amusement) or negative affect (i.e. sadness, distress) in those in the induction conditions. Participants then underwent a mood induction procedure which consisted of watching a film clip (under 5 minutes long) to induce either a positive or negative mood for those in the

mood induction conditions. For those in the control condition, a neutral video clip was used (under 5 minutes long). In a chapter from the *Handbook of Emotion Elicitation and Assessment* (Coan & Allen, 2007), Rottenberg, Ray and Gross (2007) recommend validated film clips that can be used for positive and negative affect induction. Three recommended validated clips were used in the present study. To induce positive affect, participants watched a short clip (3'25") from "Robin Williams Live" (1986). In the clip Robin Williams does a stand-up comedy routine. This clip has successfully induced amusement in mood induction validation studies (i.e. Gross & Levenson, 1995). Negative affect was induced using a short clip (2'51") from the movie "The Champ" (1979). In this scene a little boy is crying over the loss of his father, the "Champ", a boxer who has just died of injuries after a boxing match. Rottenberg, Ray and Gross (2007) reported that this film has successfully induced sadness in prior studies. The neutral clip (3'52") is a short scene from the BBC Wildlife documentary "Beavers - The Master Builders" (2003). This clip describes how beavers build their lodge and is an example of a *pleasant-neutral* clip; it is expected to elicit low levels of contentment (Rottenberg, Ray & Gross, 2007) and is well tolerated. This is in contrast to a *plain-neutral* film clip (i.e. no emotional elicitation whatsoever) and is less tolerated by participants (i.e. boring, monotonous).

As a cover for the true intent of inducing mood in the participants, all were told prior to viewing the clip that the researchers were pilot testing the clip that they were about to view for a separate study. After viewing the short clip, the participants were given a short filler questionnaire that asked about the content of the clip (i.e. sound and image quality, likes and dislikes about clip) to aid in masking the true intention of the clip. A manipulation check was also performed (i.e. current mood level was again assessed). Participants were then asked to play

No Limit Texas Hold'Em poker, for approximately fifty minutes on a lab computer using Full Tilt online poker software.

Combining mood induction techniques can increase the effectiveness of mood induction procedures and maintain induced moods (Westermann, Spies, Stahl & Hesse, 1996; Fox, Knight & Zelinski, 1998). To enhance and prolong the film mood induction technique, participants in the positive and negative mood conditions were asked to listen to classical music for the entire duration of the time that they played. Those in the neutral condition did not listen to any music while they played. Music chosen for the negative and positive mood inductions were selected from validated classical music pieces used by Eich, Ng, Macaulay, Percy and Grebneva (2007).

Full Tilt online poker software⁷ allows individuals to play against other players from around the world using free “play money” or real money. Participants in the present study played with “play money” at a ring game table. Please see Appendix L for a screen shot of a typical game table on this software. The play money is represented as different coloured virtual poker chips that represent different chip values (i.e. black chips equal one hundred dollars in play money). Ring games are poker games that allow for continuous play, where blinds (forced bets) before the flop are held constant. This is in contrast to a tournament, in which the blinds go up at timed intervals. The aim of a tournament is to be the last person with chips. Unlike ring game chip values, chip values in tournaments do not equal corresponding values in play money. Instead, tournaments will give a certain amount of players a prize (i.e. last nine players in a tournament) and the amount of prize each person wins depends on how many players have entered a tournament. Once you have lost all of your chips, you can no longer play in the tournament and are automatically removed from the game. In a ring game, players are able to

⁷ The Full Tilt Poker site shut down in April, 2011, in a well publicized legal battle with the US Department of Justice. Full Tilt was bought by another major poker site (PokerStars) this year and will be relaunched within the coming months.

play as long as they please and can reload their chips as many times as they wish. There are two different types of ring game play money tables on Full Tilt poker software: short-handed and full tables. Short-handed games have a maximum of six seats at the table and full tables have a maximum of nine. Participants played at a full table, play-money ring game. Poker hands were recorded by Full Tilt software for later analysis. The chat feature was turned off during game play to avoid confounding any mood effects.

After participants played for 20 minutes, they were asked to finish the hand that they were playing and sit out at the table temporarily. They were then asked to fill out their mood state for a third time. Participants then continued to play for the remaining 30 minutes. After play was completed, they were asked to fill out their mood state for a fourth and last time. Participants were then debriefed (See Appendix I for the debriefing text) and told the true intention of the study.

Coding of Poker Hands. The coding of all poker hands for all participants involved several steps. As mentioned previously, a text-based hand history file is recorded automatically by a player's online poker game software during play for each table a player sits at. All play-money text hand history files (for an example of a hand history, please see Appendix N) for each participant were first converted to real-money hand history files to enable Poker Tracker software to read the files. These files were converted by placing a "\$" in front of each dollar amount in the hand history file (in play money files, there are no dollar signs in front of play money dollars). This was done using a "find and replace" word processing method. Poker Tracker is a computer software program available for individuals that play online poker (See Appendix O for a screenshot of Poker Tracker). It enables the creation of multiple databases and a database was created for each participant. Players' hand histories were imported into their

respective databases to allow for review and coding of player decisions. Poker Tracker is typically used to track and display player statistics for playing sessions and enables the replaying of hands. The replayer tool allows the step-by-step replaying of all decisions made at a poker table for each hand in a playing session and assisted in the coding of each decision.

After a players' hand history file(s) was imported into Poker Tracker, several steps were involved in the coding process. A summary and detailed list of these steps is available in Appendix P. To assist in coding, a coding sheet was created (See Appendix Q for a typical filled in coding sheet), as many of the counts used to create the needed poker statistics could only be done manually (i.e. number of negative EV hands played voluntarily). Two individuals completed the coding, with one individual coding approximately 23% of the participants and the other coding approximately 77%. The integrity of the coding was ensured by randomly selecting 10 coded participants from each individual's coding list and rechecking the coding and counts. If an error was found, all of that individual's work was rechecked. The total amount of time needed for coding one participant (including preparation of necessary files etc.) was, on average, approximately 3 hours.

Results

Data Screening. All skewness and kurtosis values in variables of interest were examined using SPSS software. All values were within reasonable bounds (between -1 and 1) with the exception of baseline sadness (skewness value = 2.02, $N = 83$) and number of negative EV decisions over session (skewness values determined for each condition). The skewness values for the positive, negative and neutral conditions were .62, 1.69 and 1.18 respectively. The positive skew in baseline sadness was consistent with the results in Study 1 and previous mood research in lab settings (Westermann, Spies, Stahl & Hesse, 1996). Baseline levels of Sadness were not

transformed as it was essential that it remain in its original scale to ascertain whether a mood induction was effective. The number of negative EV decisions over session variable (Post-Flop Risk A) was transformed through a square root transformation to remedy the positive skew. After the transformation, the skewness values improved in all three conditions (positive, -.17; negative, .07; neutral, .13). Evidence for outliers was examined in the variables of interest. No univariate or multivariate outliers were identified.

Validity of Mood Induction. To validate the effectiveness of the mood induction procedures, several analyses were performed.⁸ To view estimated marginal means in Happiness and Sadness scores across all time points by condition, see Figure 2. First, a one-way between groups ANOVA was performed to test whether there were significant group differences in happiness and negative affect both before and after the mood induction. As expected, no group differences were found at baseline for either Happiness, $F(2, 80) = 1.03, p = .90$, or Sadness, $F(2, 80) = 0.39, p = .68$, confirming that the randomization of participants was successful. There were group differences with respect to Time 2 Happiness, $F(2, 80) = 59.80 (p < .001)$, and Sadness, $F(2, 80) = 64.22 (p < .001)$. Tukey post-hoc comparisons of the three groups indicate that those in the negative mood condition ($M = 5.53, 95\% \text{ CI } [4.43, 6.63]$) had significantly higher Time 2 Sadness than those in the positive condition ($M = .72, 95\% \text{ CI } [.42, 1.03]$), $p < .001$ and neutral condition ($M = .98, 95\% \text{ CI } [.55, 1.40]$), $p < .001$. Consistent with results in Study 1, there was no difference in Time 2 Sadness between the positive and neutral conditions, $p = .85$. Similarly, those in the negative condition ($M = 3.13, 95\% \text{ CI } [2.27, 3.99]$) had significantly lower Time 2 Happiness than those in the positive condition ($M = 8.00, 95\% \text{ CI } [7.14, 8.86]$), $p < .001$.

⁸ The measures for happiness and sadness showed good external validity. Baseline happiness correlated $r = .47$ with mood regulation, $p < .01$ and baseline sadness correlated $r = -.37$ with mood regulation, $p < .01$.

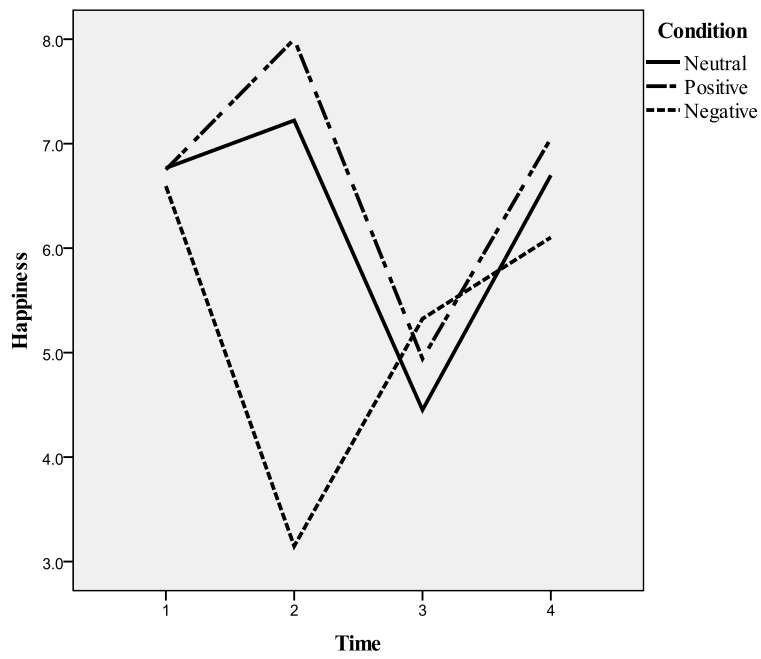
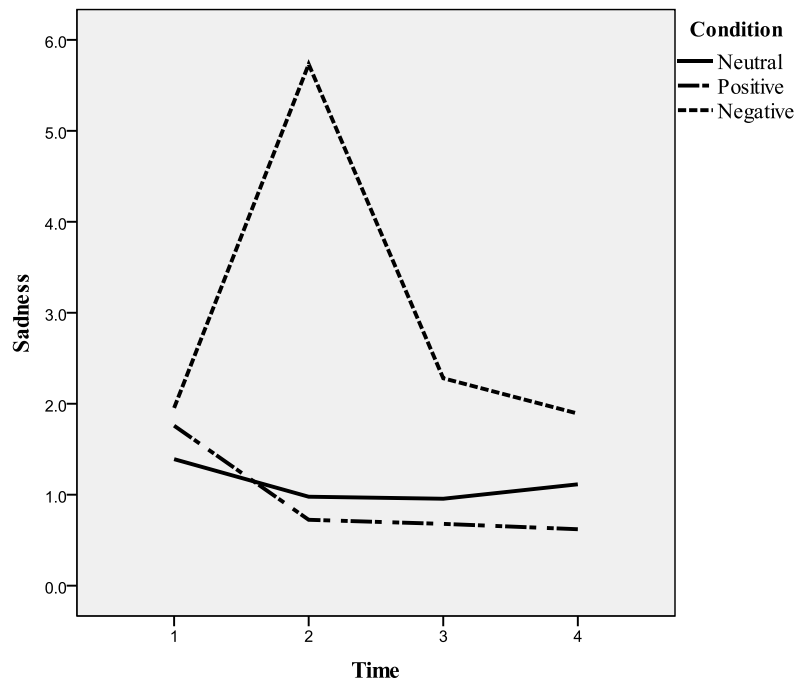
A**B**

Figure 2. Estimated marginal means of affect by condition and time. A: Happiness B: Sadness.

Note: Time 1 = Baseline; Time 2 = Post-Induction; Time 3 = After 20 minutes of play; Time 4 = After 50 minutes of play.

Table 6
Paired Sample t Tests and Effect Sizes of Mean Differences between Pre and Post Affect Scores by Condition

Affect Type	<i>M</i> difference	<i>SD</i>	<i>t</i> ^a	<i>d</i>
Positive Mood Condition (<i>n</i> = 29)				
Happiness	-1.25***	1.39	-4.83	.90
Sadness	1.03**	1.78	3.13	.58
Negative Mood Condition (<i>n</i> = 27)				
Happiness	3.45***	2.71	6.62	1.27
Sadness	-3.68***	3.45	-5.57	1.07
Neutral Mood Condition (<i>n</i> = 27)				
Happiness	-.46*	1.10	-2.15	.42
Sadness	.41	1.43	1.50	.29

^a Positive condition, *df* = 28; Negative condition, *df* = 26; Neutral condition, *df* = 26.

* *p* < .05 ***p* < .01 ****p* < .001

[7.42, 8.58]), *p* < .001 and neutral condition (*M* = 7.22, 95% CI [6.61, 7.86]), *p* < .001. There was again no difference in Time 2 Happiness between the positive and neutral conditions, *p* = .88

To investigate whether positive and negative affect increased or decreased in the desired direction, paired-sample *t*-tests were performed in each condition. Results of these analyses and effect sizes are depicted in Table 6. As shown, Happiness and Sadness changed significantly in the desired directions in the positive mood condition, indicating that the positive mood induction was effective. Cohen's *d* values indicate that the positive mood induction had a large effect on happiness and a moderate effect on Sadness. The positive induction exerted a larger effect on positive affect induction than negative affect reduction. In the negative mood condition, Happiness and Sadness increased and decreased in the desired directions. According to Cohen's *d* values, the negative mood induction had larger effects on affect than did the positive mood induction. These results are consistent with results found in Study 1, as well as past mood

Table 7
Paired Sample t Tests and Effect Sizes of Mean Differences in Affect Scores across Playing Session

	<i>F</i>	Positive		Negative		Neutral	
		<i>t</i> ^a	<i>d</i>	<i>t</i> ^a	<i>d</i>	<i>t</i> ^a	<i>d</i>
Happiness							
Time 3	.39	Time 2-3: 4.21***	.78	Time 2-3: -2.60*	.50	Time 2-3: 4.39***	.85
Time 4	1.53	Time 3-4: -3.88**	.72	Time 3-4: -1.16	.23	Time 3-4: -3.63**	.70
Sadness							
Time 3	11.09***	Time 2-3: .34	.06	Time 2-3: 4.94***	.95	Time 2-3: .17	.03
Time 4	7.88**	Time 3-4: .38	.07	Time 3-4: .81	.16	Time 3-4: -.68	.13

^a Positive condition, *df* = 28; Negative condition, *df* = 26; Neutral condition, *df* = 26.

* *p* < .05 ***p* < .01 ****p* < .001

research in lab settings (Gasper, 2004; Westerman, Spies, Stahl, & Hesse, 1996). In the neutral group, Happiness increased significantly, though this effect was small/moderate (*d* = .42). This result is not unexpected as Rottenberg, Ray and Gross (2007) noted that *neutral-pleasant* clips do indeed elicit some emotion and can induce feelings of mild contentment and relaxation, for example. Both the positive and negative induction video clips had more than twice the affect on Happiness scores than did the neutral clip. Sadness scores did not change significantly when individuals watched the neutral film clip.

To investigate whether the effects of the mood induction lasted throughout the playing session, two separate mixed models ANOVAs were conducted for Sadness and Happiness scores with time (3 levels: Time 2, Time 3, Time 4) as a repeated factor and condition (3 levels) as a between-subjects factor. A significant interaction of Time X Condition was found for both Sadness, $F(2, 156) = 23.20, p < .01, \eta^2 = .37$, and Happiness $F(3.22, 125.54) = 10.82, p < .01, \eta^2 = .30$. To examine these significant interactions and any mood changes throughout the playing session, one-way between-subjects ANOVAs were performed at Time 3 and 4 to investigate

group mood differences, followed by paired sample *t*-tests to explore the stability of Happiness and Sadness scores from Time 2-3 and Time 3-4 for each condition. The detailed results of these analyses can be found in Table 7. Results revealed no significant group difference in Happiness scores at Time 3 (20 minutes into playing session) and Time 4 (end of playing session); however, there were significant group differences in sadness scores at both Time 3 and 4. Tukey post-hoc analyses revealed that those in the negative mood condition ($M = 2.41$, 95% CI [1.51, 3.32]) had significantly higher Time 3 Sadness scores than those in the positive condition ($M = 0.68$, 95% CI [0.39, 0.96]), $p < .001$, and neutral condition ($M = 0.96$, 95% CI [.60, 1.31]), $p < .001$, indicating that the negative mood induction was successfully maintained after 20 minutes of play time. Similarly, those in the negative mood condition had higher Time 4 Sadness scores than those in the positive and neutral groups (marginally significant: $M = 3.00$, 95% CI [2.69, 3.32], $p < .001$), indicating that the negative mood induction was reasonably maintained throughout the playing session.

The results of the paired-samples *t*-tests (see Table 7) indicate that Happiness scores significantly decreased from Time 2 (post-induction) to Time 3 (after 20 minutes of play) for those in the positive and neutral conditions. This is not unexpected as many situations during poker play may affect mood negatively (i.e. losses, lack of quality starting hands, etc.). There were no significant changes in Sadness scores in the positive or neutral group from Time 2 to Time 3. Those in the negative mood experienced improved mood after 20 minutes of play with significantly higher Happiness scores and significantly lower Sadness scores. This finding is not unexpected as one might reasonably expect some mood improvement post-induction while one is focused on a complex decision task such as poker. However, the higher group mean in Sadness scores in the negative group indicates that despite the improvements in mood after 20 minutes of

Table 8
Descriptive Statistics for Experienced vs. Less Experienced Players and Results of Independent Sample t Test

Variable	Experienced ^a		Less Experienced ^b		<i>t</i> (55)
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Baseline Sadness	1.35	1.46	1.99	2.30	1.23
Baseline Happiness	6.91	1.25	6.51	1.83	-.96
Mood Regulation	3.11	.48	3.11	.44	.06
Online Poker Play (Frequency)	21.24	9.44	6.03	6.08	-7.31***
Real Money Play (Frequency)	16.30	8.63	3.97	5.12	-6.64***
Online Real Money Play (Frequency)	9.67	7.22	0.68	2.95	-6.27***
Pre-flop Risk-Taking	.47	.23	.62	.19	2.15*
Post-flop Risk-Taking (A)	.14	.11	.24	.21	2.33*
Post-flop Risk-Taking (B)	1.32	.57	1.73	.45	2.99**
Chip Profit	-77,624	327,032	-184,367	275,290	-1.34
Win/Loss Score	-10.67	13.16	-21.47	11.71	-3.28**

Note: NA = negative affect; PA = positive affect

^a *n* = 27; ^b *n* = 30

* *p* < .05 ***p* < .01 ****p* < .001

play, the effects of the negative mood induction are still present. From Time 3 to Time 4 (end of session), Happiness scores significantly increased in the positive and neutral conditions.

Happiness scores did not change significantly from Time 3 to Time 4 in the negative mood condition. Sadness scores did not change significantly from Time 3 to Time 4 in any of the conditions.

Preliminary Analyses.

Characteristics of Experienced vs. Less Experienced Players. Preliminary analyses were performed in Study 2 to examine any differences between experienced and less experienced players among variables of interest. Similar to Study 1, experience scores were ranked in tertiles according to experience level scores. The top third experience level was compared to the bottom

third on variables by utilizing independent sample *t*-tests. Results revealed that those with more experience did not significantly differ from those with less experience with respect to baseline Happiness and Sadness and Mood Regulation scores. More experienced players also reported playing online poker, playing poker for real money (whether live or online) and playing online poker for real money more frequently than those with less poker experience. With respect to poker play variables, experienced players played significantly fewer poor hands pre-flop, made significantly fewer post-flop negative EV decisions and made significantly fewer post-flop decisions across the playing session than less experienced players. Though experienced and inexperienced players did not differ with respect to Chip Profit at the end of the playing session, experienced players had significantly higher Win/Loss Scores than those less experienced.

Bivariate Relations among Variables of Interest. To investigate preliminary relationships between variables, intercorrelations amongst variables of interest in the current study were examined (See Table 9). A negative relationship between experience and risk-taking was found in both the positive and neutral conditions. However, poker experience was unrelated to any of the poker risk indices in the negative condition. Table 9 illustrates the bivariate relationships between the affect and risk variables. Affect variables (Sadness and Happiness) were not significantly related to the risk indices in any condition. Because poker experience was related to risk-taking in all three conditions to a degree, partial correlations between affect and risk-taking were performed after controlling for poker experience. No changes emerged in the bivariate relationships between affect and risk-taking once the effects of poker experience were partialled out.

Table 9
Descriptives and Intercorrelations among Variables of Interest for Each Condition

Measure	1	2	3	4	5	6	7	8	<i>M</i>	<i>SD</i>
Positive Condition										
1. Post Sad	-	-.66**	.11	.05	.21	-.06	.12	.29	.72	.81
2. Post Happy		-	.13	-.14	.30	-.16	-.02	-.10	8.0	1.52
3. Experience			-	-.44*	-.24	-.42*	.13	.39*	2.12	.40
4. Pre-flop Risk				-	.64**	.73**	-.54**	-.53**	.58	.23
5. Post-flop Risk (A)					-	.49**	-.44*	-.04	.17	.14
6. Post-flop Risk (B)						-	-.31	-.59**	1.46	.52
7. Amount Won							-	.51**	-147,775	260,729
8. Win/Loss Score								-	-18.93	12.10
Negative Condition										
1. Post Sad	-	-.56**	-.08	.13	.12	.10	.02	.03	5.53	2.78
2. Post Happy		-	.24	-.04	.14	-.08	-.08	.02	3.13	2.18
3. Experience			-	-.08	-.06	-.22	.13	.23	2.06	.50
4. Pre-flop Risk				-	.61**	.81**	-.22	-.32	.56	.20
5. Post-flop Risk (A)					-	.60**	-.34	-.23	.15	.13
6. Post-flop Risk (B)						-	-.24	-.26	1.57	.45
7. Amount Won							-	.79**	-73,025	304,742
8. Win/Loss Score								-	-16.19	14.06
Neutral Condition										
1. Post Sad	-	-.56**	-.12	-.04	-.00	-.02	.04	-.00	.98	1.08
2. Post Happy		-	.24	.06	-.04	.07	-.12	.12	7.22	1.55
3. Experience			-	-.64**	-.61**	-.73**	.28	.49**	2.19	.48
4. Pre-flop Risk				-	.69**	.87**	-.56**	-.57**	.51	.23
5. Post-flop Risk (A)					-	.73**	-.54**	-.46*	.22	.19
6. Post-flop Risk (B)						-	.47*	-.49*	1.51	.58
7. Amount Won							-	.76**	-140,676	297,479
8. Win/Loss Score								-	-15.96	11.43

Note. Post Sad and Happy = Sad 2 and Happy 2; Pre-flop Risk = Percentage of negative EV hands played pre-flop; Post-flop Risk (A) = Number of negative EV decisions over session; Post-flop Risk (B) = Total number of decisions over session.

** $p < .01$, * $p < .05$, † $p < .10$

Investigating Group Effects in Decision-Making. To test Hypothesis 1, levels of risk-taking were examined across mood conditions to test for significant differences.⁹ A one-way, between subjects ANOVA was performed with Pre-flop Negative EV session score, Post-flop Negative EV session score and Total Decisions session score entered as dependent variables. No

⁹ Preliminary analyses indicated that groups did not significantly differ with respect to Task Performance.

group differences were found in either Pre-Flop Negative EV Score, $F(2, 80) = .60, p = .55$, Post-Flop Negative EV Score, $F(2, 80) = 1.33, p = .27$, or Total Decisions Score, $F(2, 80) = .28, p = .78$. Because the effect of the mood manipulation significantly decreased in the negative condition after 20 minutes of poker play, the poker risk indices were calculated for the first 20 minutes of play using the same method utilized for risk scores across the session. The poker risk indices were calculated for play during a temporal window (i.e. first 20 minutes) when the effects of the mood induction on risk may presumably be stronger (as opposed to including poker play that is temporally farther from the mood induction). Results again revealed no group effects with respect to Pre-Flop Negative EV Score, $F(2, 80) = .60, p = .55$, Post-Flop Negative EV Score, $F(2, 80) = 2.25, p = .11$, or Total Decisions Score, $F(2, 80) = .28, p = .78$, during the first 20 minutes of play.

The Interaction of Affect and Experience in Decision-Making. To test Hypothesis 2, six regression models were performed to investigate the interactive effect of experience and affect on poker risk-taking in a real-time poker decision task. The results of these analyses are presented in Tables 10 and 11. Happiness and sadness were highly correlated variables, as depicted in Table 9, thus their effects on risk-taking were examined in separate analyses. In Models 1, 2 and 3, post-induction Sadness and Poker Experience were entered in the first step and their interaction term was entered in the second step. Prior to computing the interaction terms in all regression models, both variables were centered by subtracting the subjects raw scores on these variables from their mean score (West, Aiken & Krull, 1996).

Models 1 to 6 were non-significant in the negative mood condition. Thus, neither affect nor experience predicted risk during the playing session for those that had undergone a negative mood induction. Results however emerged in the positive and neutral conditions. In the first

regression model (Model 1) predicting Pre-Flop Negative EV Scores, a significant post-induction Sadness X Experience interaction was found in the positive condition. This interaction accounted for 14% of the variance in poker risk-taking (total variance accounted for = 43%). To better understand this interaction, Poker Experience was dichotomized into high and low by splitting this variable into +1 and -1 SDs from the mean (West, Aiken & Krull, 1996). This relationship is depicted in Figure 3. As shown, it appears that Pre-Flop Negative EV Scores change little as a function of Sadness in those with a high degree of Poker Experience; consistent with the AIM. Conversely, Sadness appears to be positively related to pre-flop risk in those with low poker experience. To explore the significance of the individual slopes in this relationship, simple slopes tests were performed using ModProbe (Hayes & Mathes, 2009). Results of the simple slopes test revealed that the slope for those low in experience was significantly different from zero ($b = .15$, $p < .05$). The slope was not significantly different from zero for those high in Poker Experience ($b = -.12$, $p = .16$). In Model 1, Poker Experience was a significant predictor of Pre-Flop Negative EV Scores in the neutral condition (total $R^2 = .43$). Post-induction Sadness did not emerge as a significant main effect in any of the conditions for Models 1, 2 and 3. No significant interactions were found in either the neutral or negative conditions.

In Model 2, a significant main effect of Experience was found in the neutral group; a higher degree of Poker Experience was associated with lower Post-Flop Negative EV Scores. Experience accounted for approximately 38% of the variance in Post-Flop Negative EV Scores. When predicting Total Decisions Scores in Model 3, Poker Experience emerged as a significant main effect in the positive (step was only marginally significant) and neutral conditions. Experience accounted for approximately 55% of the variance in Total Decisions Scores in the in.

Table 10
*Hierarchical Regression of Post-Induction Sadness, Poker Experience and their Interaction on
 Poker Risk Indices by Condition*

Predictor	Pre-Flop Risk (Model 1)			Post-Flop Risk (A) (Model 2)			Post-Flop Risk (B) (Model 3)		
	ΔR^2	<i>B</i>	95% CI	ΔR^2	<i>B</i>	95% CI	ΔR^2	<i>B</i>	95% CI
Positive Condition									
Step 1	.21*			.15			.18 [†]		
Sad		.03	[-0.08, 0.06]		-.05	[-0.12, 0.01]		-.01	[-0.25, 0.23]
Experience		-.27*	[-0.48,-0.05]		-.07	[-0.20, 0.06]		-.54*	[-1.02,-0.07]
Step 2	.14*			.00			.00		
Sad x Experience		-.32*	[-0.61,-0.03]	.	-.03	[-0.22, 0.16]		.01	[-0.70, 0.72]
Total R^2	.43**			.15			.18		
Negative Condition									
Step 1	.02			.02			.06		
Sad		.01	[-0.02, 0.04]		-.01	[-0.13, 0.10]		.01	[-0.05, 0.08]
Experience		-.03	[-0.20, 0.14]		-.02	[-0.01, 0.03]		-.19	[-0.57, 0.18]
Step 2	.00			.00			.00		
Sad x Experience		-.00	[-0.08, 0.08]	.	-.00	[-0.05, 0.05]		-.00	[-0.18, 0.18]
Total R^2	.02			.02			.06		
Neutral Condition									
Step 1	.41**			.38**			.55**		
Sad		-.01	[-0.08, 0.06]		-.01	[-0.07, 0.05]		-.06	[-0.21, 0.10]
Experience		-.31**	[-0.47,-0.15]		-.24**	[-0.37,-0.11]		-.90**	[-1.25, 0.56]
Step 2	.02			.02			.00		
Sad x Experience		-.05	[-0.19, 0.09]	.	-.05	[-0.17, 0.07]		-.04	[-0.35, 0.27]
Total R^2	.43**			.40**			.55**		
<i>n</i>	157			162			129		

Note. Sad = post-induction Sadness.

** $p < .01$, * $p < .05$, [†] $p < .10$

the neutral condition. Sadness was not a significant predictor of Total Decisions Scores in any condition. Additionally, no significant interactions emerged in Model 3.

In Models 4, 5 and 6, post-induction Happiness and Poker Experience were entered in the first step and their interaction term was entered in the second step. No significant post-induction Happiness X Poker Experience interaction was found in either Models 4, 5 or 6 across any of the conditions. In Model 4, predicting Pre-flop Negative EV Scores, no main effects emerged for

Table 11
Hierarchical Regression of Post-Induction Happiness, Poker Experience and their Interaction on Poker Risk Indices By Condition

Predictor	Pre-flop Risk (Model 4)			Post-flop Risk (A) (Model 5)			Post-flop Risk (B) (Model 6)		
	ΔR^2	<i>B</i>	95% CI	ΔR^2	<i>B</i>	95% CI	ΔR^2	<i>B</i>	95% CI
Positive Condition									
Step 1	.20 [†]			.17 [†]			.20 [†]		
Happy		-.01	[-0.07, 0.04]		.03 [†]	[-0.00, 0.06]		-.04	[-0.16, 0.09]
Experience		-.25*	[-0.46,-0.04]		-.10	[-0.23,-0.03]		-.53*	[-1.00,-0.06]
Step 2	.00			.00			.01		
Happy x Experience		.00	[-0.03, 0.03]	.	.00	[-0.02, 0.02]		.02	[-0.06, 0.09]
Total R^2	.20			.17			.20		
Negative Condition									
Step 1	.01			.03			.05		
Happy		-.00	[-0.04, 0.04]		.01	[-0.02, 0.04]		-.01	[-0.09, 0.08]
Experience		-.03	[-0.21, 0.15]		-.03	[-0.15, 0.09]		-.19	[-0.58, 0.19]
Step 2	.01			.03			.00		
Happy x Experience		-.01	[-0.05, 0.03]	.	-.01	[-0.03, 0.02]		-.01	[-0.09, 0.08]
Total R^2	.02			.06			.05		
Neutral Condition									
Step 1	.46**			.38**			.60**		
Happy		.03	[-0.01, 0.08]		.01	[-0.03, 0.06]		.10 [†]	[-0.01, 0.20]
Experience		-.34**	[-0.49,-0.18]		-.25**	[-0.38,-0.12]		-.97**	[-1.30,-0.63]
Step 2	.00			.03			.00		
Happy x Experience		.00	[-0.04, 0.04]	.	.02	[-0.02, 0.05]		.02	[-0.07, 0.11]
Total R^2	.46**			.41**			.60**		
<i>n</i>	157			162			129		

Note. Happy = post-induction Happiness.

** $p < .01$, * $p < .05$, [†] $p < .10$

post-induction Happiness across any conditions. A significant main effect of Experience was again found in the positive (Total $R^2 = .46$) and neutral (the step was only marginally significant) conditions. Model 5 predicted Post-Flop Negative EV Scores; Happiness emerged as a marginally significant predictor in the positive mood condition. A higher degree of post-induction Happiness was associated with higher Post-Flop Negative EV scores, consistent with predictions of the AIM. However, this result must be interpreted cautiously due to its marginal

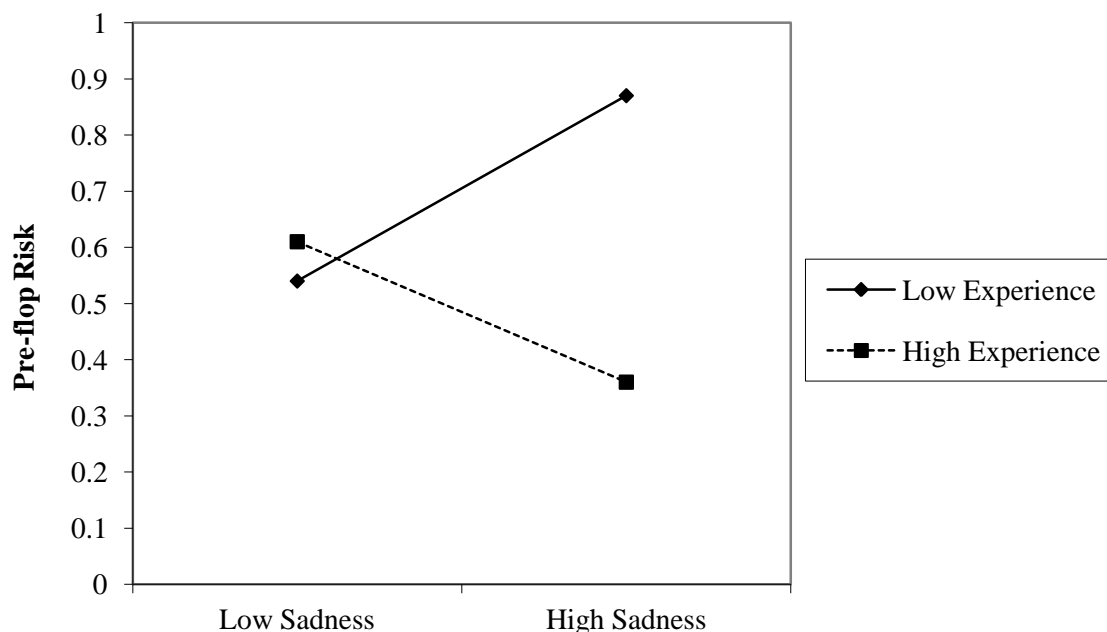


Figure 3. Graphical depiction of the interaction of post-induction sadness and experience on pre-flop risk in the positive mood condition.

significance and 95% CI (i.e. contains 0). Similar to results found for Model 2, Experience did not emerge as a significant predictor of Post-Flop Negative EV scores in the positive condition. Experience was again a significant negative predictor of Post-Flop Negative EV scores in the neutral sample, accounting for approximately 38% of the variance. In Model 6, Poker Experience emerged as a significant negative predictor of Total Decisions Scores in both the positive (the step was marginally significant) and neutral conditions, accounting for approximately 20% and 60% of the variance in Total Decisions Scores respectively.

Discussion

After having transitioned from a hypothetical poker decision task in Study 1 to actual poker play in Study 2, our results illustrated partial support for our main hypotheses in the current study. Similar to Study 1, we sought to examine whether risk-taking differed at the group

level, though in the context of a real-time task. By quantifying the level of risk for each decision made in the playing session in terms of expected value and number of decisions made, it was determined that there were no significant differences across mood conditions with respect to the risk indices. Thus, Hypothesis 1 was not supported. These results were consistent with the findings in Study 1, and ran counter to findings in the mood and risk-taking literature (Chou, Lee & Ho, 2007; Forgas, 1999; Isen & Patrick, 1983; Isen & Geva, 1987; Leith & Baumeister, 1996; Mittal and Ross, 1998; Yuen & Lee, 2003). In the second hypothesis, we examined whether the decisions of experienced players in a real-time, game context would illustrate less affect infusion than their less experienced counterparts. Hypothesis 2 was supported in the current study and fully replicated the findings of Study 1. The results were again in line with the AIM and bolster the findings in the first study that suggest that more experienced players utilize low affect infusion strategies. In sum, it is encouraging to see an identical result in both a hypothetical and real-time decision task with respect to poker experience as a moderator, lending credence to the importance of examining decision-making in a context that allows for background knowledge and experience. Unlike the hypothetical nature of the potential pay-offs of choices in Study 1, the current study did have some degree of consequence and pay-off in the form of virtual chips. It is unclear how rewarding it may be to win virtual chips that have no real-world value or sense of personal ownership. It would thus be fruitful to examine these hypotheses in a context that creates value in the virtual poker chips and gives an incentive to perform well in the poker task.

CHAPTER FOUR

STUDY 3

The first aim of the present study was to investigate decision-making in a real-time poker task that involved an incentive to give value and a sense of ownership to the virtual poker chips. The second aim was to investigate the direct effect of mood on risk-taking in decision-making in the above context. It was posited that significant differences in risk-taking at the group level may emerge with the introduction of a prize incentive, as it created a more ecologically valid gaming situation. Third, we sought to replicate the findings of our previous two studies with respect to experience as a moderator in the relationship between affect and risk-taking. Fourth, with the introduction of a new Odds Information condition, we sought to examine risk-taking when one is given explicit real-time statistics/knowledge of risk information while one plays (i.e. odds, expected value information). It appeared that the effects of a positive and neutral induction were largely redundant in Study 1 and 2, as they could not be differentiated with respect to their effects on affect. Thus, the positive mood condition was dropped in the current study and negative and neutral mood inductions were utilized only. The following hypotheses were investigated in the current study:

1. There will be significant differences in risk-taking in decision-making between the two mood conditions.
2. Those with access to real-time odds/expected value information during play will have lower risk-taking than those without access to odds information.
3. A Mood X Odds Information interaction will be investigated. If an interaction is found, it is expected that those in a negative mood, without access to odds/EV information, will have higher risk-taking scores than those in other conditions.

4. Experience will moderate the relationship between affect and risk-taking during play. The decisions of more experienced players will be less affected by affect than those with less experience.

Method

Participants. This sample consisted of 104 (89.4% male) university students ($n = 84$) and individuals in community ($n = 20$) that play poker. Participants were randomly assigned to one of four conditions: Mood Manipulation/Odds Information ($n = 26$), Mood Manipulation/No Odds Information ($n = 26$), No Mood Manipulation/Odds Information ($n = 26$), No Mood Manipulation/ No Odds Information ($n = 26$). The participants were recruited from the University of Ottawa campus through recruitment flyers posted around campus and for course credit in introductory psychology classes through the Integrated System of Participation in Research. Participants in the community were recruited through flyers posted in the community at restaurants and bars, as well as through postings in local online classified ads. Those that had previously participated in Study 1 or 2 were limited from taking part in Study 3. Participants ranged in age from 17 – 53 years ($M = 22.4$, $SD = 7.22$) and 87.5% of the sample were age 30 and below. Almost half (48.1%) reported being single, with the remainder in a relationship (39.4%), living common-law (2.9%) or married (9.6%). The majority of this sample identified themselves as Caucasian (72.1%), with remaining participants identifying as Arab/West Asian (5.8%), Chinese (3.8%), mixed origin (3.8%), Latin American (2.9%), Filipino (1.9%), Black (1.9%), South Asian (1%), Korean (1%) or Native American (1%). Of those in school, the majority were in school full-time (92.9%) and were in their first year of their degree program (60.7%). Of those from the community ($n = 20$), 15 reported working full-time, with the remainder working part-time ($n = 1$), on leave ($n = 1$), or unemployed ($n = 1$) (one individual did

not report employment status). Lastly, of those in school ($n = 84$), 46.4% were unemployed, 39.3% were working part-time and 14.3% reported being on-leave from work.

The majority of the sample reported playing poker for 1-5 years (57.7%), with the remaining playing for more than five years (33.7%) and under a year (5.8%). Similar to Study 2, participants reported playing poker most often online (42.4%) or at someone's house (51.9%), with most playing at least once every couple of weeks (68%). The most popular form of poker played was No-Limit Texas Hold'Em (97.1% reported playing it), followed by Limit Texas Hold'Em (80.8%), 5 Card Draw (29.8%), and Omaha (27.9%). A minority of the sample (18.3%) reported never having played poker for real money, with the remainder reporting that they play poker for money at least sometimes. Of those that play poker for real money, players on average spent \$608.35 in buy-ins at poker tournaments and/or ring games online and/or at live games in a month. This average does not take into account wins and losses.

Measures. The constructs in the current study (Positive and Negative Affect, Mood Regulation, Poker Experience, Demographics, Poker Play Preferences, Decision-Making Assessment, Task Performance) were measured identically to those assessed in Study 2. All risk indices were coded identically to the method used in Study 2. An additional poker play statistic was calculated for those in conditions with Hold'Em Indicator software available (real-time odds information displayed during play); the degree to which a player's decisions agreed with the information displayed by Hold'Em Indicator software during play.

Odds Information Agreement. For those in Odds Information conditions, the degree of agreement of players' decisions with the information displayed by Hold'Em Indicator was assessed during the coding of players' decisions. Hold'Em Indicator is supplemental software that provides instant, real-time pot odds and the EV of each hand dealt pre-flop, pot odds and

odds of hitting hands (i.e. flush, straight) post-flop during play. Please see Appendix M for a screenshot of this software in real time. When an action decision is put to a player that involves calling another player's bet or raise, Hold'Em Indicator displays two bars. The green bar represents win odds and the red bar represents pot odds. When the green bar is higher than the red bar, this is a positive EV decision (according to Hold'Em Indicator) and the individual is encouraged to make the call. Conversely, if the red bar is higher than the green bar, this is a negative EV decision according to Hold'Em Indicator and the individual is encouraged to fold. The agreement of players' action decisions with the information displayed by Hold'Em Indicator was calculated using four coding categories. The decision was coded as "1" if an individual called when Hold'Em Indicator indicated a call was optimal; "2" if they folded when Hold'Em Indicator indicated a fold was optimal; "3" if the individual called when Hold'Em Indicator indicated a fold was optimal; "4" if the individual folded when Hold'Em Indicator indicated a call was optimal; "5" if the decision was neutral or break-even. A *Risky Calls Score* was calculated by summing the number decisions where they called when Hold'Em Indicator suggested a fold and dividing by the number of cards dealt to give a session score. A *Conservative Folds Score* was calculated by summing the number of decisions where they folded when Hold'Em Indicator suggested a call.

Procedure and Materials. The current study was a 2X2 factorial design. Each participant was randomly assigned to one of four conditions: Negative Mood Manipulation/Odds Information, Negative Mood Manipulation/No Odds Information, No Negative Mood Manipulation/Odds Information and No Negative Mood Manipulation/No Odds Information (control). Participants were brought into a lab and asked to read and sign an informed consent. After providing informed consent, all participants read a short text passage. Those in Odds

Information conditions read a passage (686 words) introducing the concept of expected value in poker (See Appendix B for this passage). This was to enable all participants in the Odds Information conditions to have at least a basic understanding of expected value as it applies to poker. Those that were not in the Odds Information conditions read a short text passage (714 words) on the history of poker (See Appendix R for this passage). All participants then filled out a questionnaire assessing Poker Experience, Mood Regulation, Demographics and Poker Play Preferences. After the questionnaire, all participants watched a video tutorial. Those in the Odds Information conditions watched a 14-minute video that explained the basics of using Full Tilt poker software and gave a tutorial of using and understanding the statistics displayed in Hold'Em Indicator. Lastly, the video tutorial explained a prize draw and ability of participants to win/lose tickets during game play. Those not in the Odds Information watched an identical 5-minute video with just the Hold'Em Indicator tutorial removed. The prize draw/tickets were introduced in the current study to give value to the chips won/lost during a playing session. Each participant was told that they started out with three tickets for a draw to win a 6-month membership to an online poker learning forum. During the video, all participants were told that they could lose their three tickets. For every \$80,000 (buy-in) in play chips they lost, they would lose one of their tickets. This was a deception to create a sense of real loss if they lost chips. In reality, no participants could lose their initial three tickets. They were told they could win back their lost tickets if they built their stack back up in \$80,000 increments. Participants were also told they had the ability to win more tickets for every \$80,000 in chips they won above their original \$80,000 buy-in. The opportunity to win additional tickets was not a deception.

After the tutorial video, all participants filled out the first mood state measure to get baseline mood states. All participants then watched a short video. Those in the Mood

Manipulation conditions watched the identical negative mood induction video utilized in Study 2 to induce negative affect. Those in the No Mood Manipulation conditions watched the identical neutral video clip used in Study 2. Again, as a cover for the true intent of watching the video, all participants were told that the video was being piloted for use in another study. After watching the video, participants were asked to fill out a second mood state measure as a manipulation check. Filler questions about the quality and context of the clip were again placed at the back of the mood state questionnaire and respondents were asked also to fill out their opinions of the clip. Once complete, all participants were asked to leave the room briefly while the researcher prepared the lab computer for the poker task. Screen recording software was then turned on for those in the Odds Information conditions to allow for visualization of what was displayed by Hold'Em Indicator for each participant. Participants were not told about the screen recording software and it was not visible to the participant while they played. Those not in the Odds Information conditions did not have screen recording software during play. The researcher then chose a seat at a poker table on Full Tilt for the participant to play at and called the participant back in. Those in the Mood Manipulation conditions were instructed to listen to classical music during the entire duration of play. The music chosen was identical to the negative mood induction music list used in Study 2. All participants were instructed that they would be playing poker for 50 minutes. After 20 minutes, participants were asked to finish playing the rest of their hand and sit out at their table. All participants then filled out a third mood measure. After completion, all were instructed to play another 30 minutes of poker. At the end of the 30 minutes of play, participants were told that play was now completed and to play out the rest of their current hand then sit-out. All participants were then given a fourth and final mood measure. Participants were then fully debriefed and any deceptions used in the study were explained.

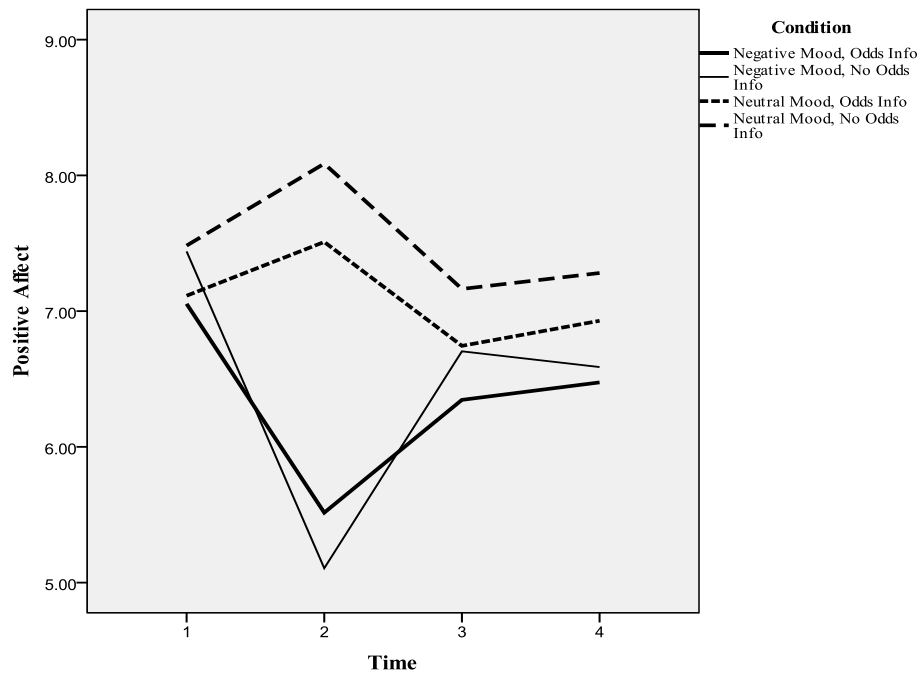
Results

Data Screening. All skewness and kurtosis values of the variables of interest in Study 3 were examined using SPSS software. All values were within reasonable bounds (between -1 and 1) with the exception of baseline Negative Affect (skewness value = 2.02, $N = 104$) – consistent with the skewness values of baseline Negative Affect found in Study 1 and 2. Baseline Negative Affect was not transformed as it was essential that it remain in its original scale to ascertain whether a mood induction was effective. Evidence for outliers was examined in the variables of interest. No univariate or multivariate outliers were identified.

Validity of Mood Induction. To investigate the effectiveness of the mood induction procedures, several analyses were performed.¹⁰ See Figure 4 for estimated marginal means in Positive and Negative Affect scores across all time points by condition. First, an independent samples *t*-test was performed to test whether there were significant group differences between neutral and negative mood conditions (neutral conditions were combined and negative conditions were combined) in Positive and Negative Affect both before and after the mood induction procedure. As expected, no group differences were found at baseline for either positive affect, $t(101) = 0.19, p = .85$, or negative affect, $t(101) = -0.88, p = .38$, validating the randomization of participants. There were group differences with respect to Time 2 (post-induction) Positive Affect, with those in the negative mood conditions ($M = 5.31, SD = 2.10$) having significantly lower Time 2 Positive Affect than those in the neutral conditions ($M = 7.80, SD = 1.39$), $t(101) = 7.08, p < .001, d = 1.40$. Similarly, those in the negative conditions ($M = 3.47, SD = 2.04$) had significantly higher post-induction Negative Affect than those in the neutral conditions ($M = 0.70, SD = 1.03$), $t(101) = p < .001, d = 1.71$.

¹⁰ The measures for positive and negative affect showed good external validity. Baseline positive affect correlated $r = .34$ with mood regulation, $p < .01$ and baseline negative affect correlated $r = -.58$ with mood regulation, $p < .01$.

A



B

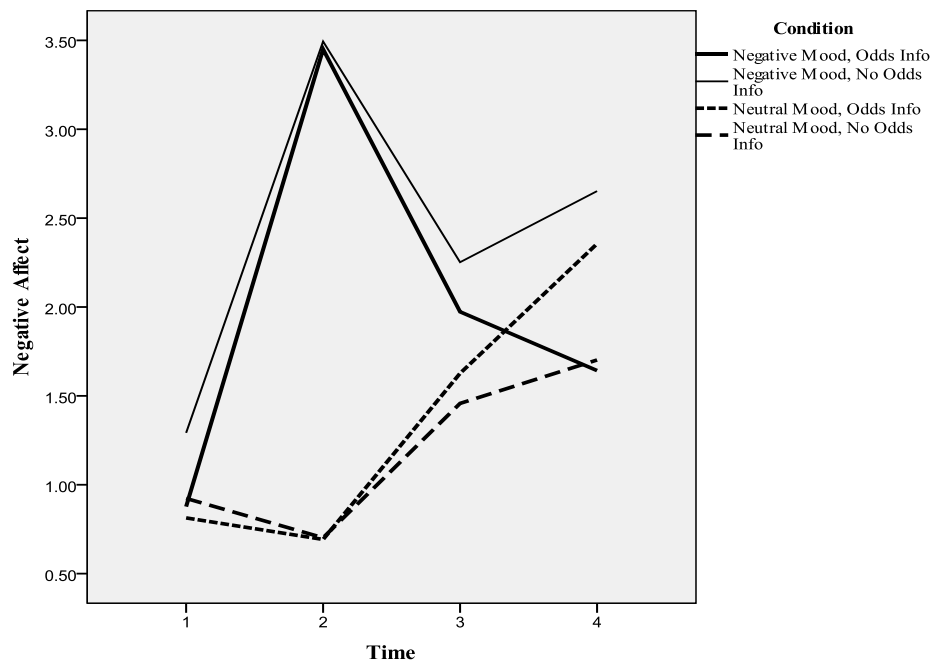


Figure 4. Estimated marginal means of affect by condition and time. A: Positive affect B: Negative affect.

Note: Time 1 = Baseline; Time 2 = Post-Induction; Time 3 = After 20 minutes of play; Time 4 = After 50 minutes of play.

To investigate whether positive and negative affect significantly increased or decreased in the desired direction, paired-sample *t*-tests were performed in the two mood conditions. Results of these analyses and effect sizes are depicted in Table 12. As shown, positive and negative affect changed significantly in the desired directions in participants in the negative mood conditions, indicating that the negative mood induction was effective. Cohen's *d* values indicate that the negative mood induction had a large effect on positive and negative affect. In the neutral mood conditions, positive affect significantly increased and negative affect decreased. This result is consistent with Study 2 and other *neutral-pleasant* clips (Rottenberg, Ray & Gross, 2007), as some emotional elicitation is expected. Also consistent with Study 1 and 2, the negative mood induction had a larger effect on affect than did the neutral induction. In sum, the mood induction procedures were successful and induced the desired mood states post-induction.

To investigate whether the effects of the mood induction lasted throughout the playing session, analyses proceeded identically to those conducted in Study 2; two separate mixed model ANOVAs were conducted for Positive and Negative Affect scores with time (3 levels: Time 2, Time 3, Time 4) as a repeated factor and condition (4 levels) as a between-subjects factor. A significant interaction of Time X Condition was found for both Positive, $F(6, 198) = 6.60, p < .01, \eta^2 = .17$, and Negative Affect, $F(5.24, 172.82) = 11.30, p < .01, \eta^2 = .26$. To examine these significant interactions and any mood changes throughout the playing session, one-way ANOVAs were performed at Time 3 and 4 to investigate group mood differences, followed by paired sample *t*-tests to explore the stability of Positive and Negative Affect scores from Time 2-3 and Time 3-4 for each condition. The detailed results of these analyses can be found in Table 13. Results revealed no significant group difference in Positive or Negative Affect scores at

Table 12
Paired Sample t Tests and Effect Sizes of Mean Differences between Pre and Post Affect Scores by Condition

Affect Type	M difference	SD	t^a	d
Negative Mood Conditions ($n = 52$)				
Positive Affect	1.93***	2.26	6.10	0.85
Negative Affect	-2.39***	1.93	-8.08	1.23
Neutral Mood Conditions ($n = 52$)				
Positive Affect	-.50**	.97	-2.15	0.51
Negative Affect	.17*	.58	1.50	0.29

^a Negative condition, $df = 50$; Neutral condition, $df = 51$.

* $p < .05$ ** $p < .01$ *** $p < .001$

Time 3 (20 minutes into playing session) and Time 4 (end of playing session). This is not consistent with Study 2 and indicates that the negative mood induction was not maintained after 20 minutes of play time, although the initial induction was successful. One possible explanation for this is the addition of the ticket incentive in the current study. Perhaps players were motivated to regulate their moods more during play when there was a value placed on win/losses and a potential reward? To investigate this possibility, exploratory analyses were performed comparing individuals in Study 2 and 3 on their Time 3 (20 minutes into play) Sadness and Happiness scores. To ensure similarities of design across studies, those in the Neutral ($n = 27$) condition in Study 2 and those in the Neutral Mood/No Odds Info ($n = 26$) condition were compared with one another. Similarly, those in the Negative condition in Study 2 ($n = 29$) were compared to those in the Negative Mood/No Odds Info condition ($n = 26$). Results of two independent samples t -tests revealed that Neutral players in the current study ($M = 7.41$, $SD = 2.03$) had significantly higher Time 3 Happiness scores than Neutral players in Study 2 ($M = 6.09$, $SD = 1.63$), $t(51) = -2.63$, p

Table 13
Paired Sample t Tests and Effect Sizes of Mean Differences in Affect Scores across Playing Session

	<i>F</i>	Negative Mood/ Odds Info <i>t</i> ^a	Neutral Mood/ Odds Info <i>t</i> ^a	Negative Mood/ No Odds Info <i>t</i> ^a	Neutral Mood/ No Odds Info <i>t</i> ^a
PA					
Time 3	1.00	Time 2-3: -2.18* (.43)	Time 2-3: 2.98** (.58)	Time 2-3: -2.78* (.56)	Time 2-3: 3.50** (.74)
Time 4	3.42	Time 3-4: -0.35 (.07)	Time 3-4: -0.72 (.14)	Time 3-4: 0.21 (.04)	Time 3-4: -0.43 (.08)
NA					
Time 3	1.24	Time 2-3: 3.67** (.72)	Time 2-3: -3.63** (.71)	Time 2-3: 2.88** (.58)	Time 2-3: -2.23* (.44)
Time 4	1.67	Time 3-4: 1.10 (.22)	Time 3-4: -2.53* (.50)	Time 3-4: -1.66 (.33)	Time 3-4: -0.72 (.14)

Note: Cohen's *d* values are within the brackets; PA = Positive Affect, NA = Negative Affect

^a *df* in each condition = 25

* $p < .05$ ** $p < .01$ *** $p < .001$

$< .05$, $d = .72$. They did not differ in Time 3 Sadness, $t(51) = .97$, $p = .34$. Similarly, Negative players in the current study ($M = 1.40$, $SD = 1.87$) had significantly lower Time 3 Sadness scores than Negative players in Study 2 ($M = 3.56$, $SD = 2.87$), $t(51) = 3.24$, $p < .01$, $d = .89$. These results support the possibility that Study 3 players were regulating their moods to a larger extent than players in Study 2.

The results of the paired-samples *t*-tests (see Table 13) indicate that Positive Affect scores significantly increased from Time 2 (post-induction) to Time 3 (after 20 minutes of play) for those in the negative conditions. Likewise, Negative Affect scores significantly decreased from Time 2 to Time 3. It is likely that these participants experienced mood improvements via focus on a complex decision task they enjoy (i.e. poker), the passage of time and/or mood regulation efforts. Positive Affect significantly decreased for those in the neutral conditions from Time 2 to Time 3. Similarly, Negative Affect scores also increased. Again, many aspects of the game may affect mood during game play (lack of good quality starting hands, large losses, and bad beats). There were no significant changes in Positive Affect scores in any conditions from

Table 14
Descriptive Statistics for Experienced vs. Less Experienced Players and Results of Independent Sample t Test

Variable	Experienced ^a		Less Experienced ^b		<i>t</i> (67)
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Baseline NA	.72	1.02	.97	1.47	.81
Baseline PA	7.74	2.71	7.14	1.57	-1.75 [†]
Mood Regulation	3.23	.38	3.04	.48	-1.74 [†]
Online Poker Play (Frequency)	34.74	18.81	5.35	6.91	-8.56***
Real Money Play (Frequency)	22.43	12.71	3.03	6.91	-8.52***
Online Real Money Play (Frequency)	12.51	7.81	0.44	1.80	- 6.27***
Pre-flop Risk-Taking	.32	.18	.50	.16	4.43***
Post-flop Risk-Taking (A)	.13	.09	.18	.09	2.40*
Post-flop Risk-Taking (B)	1.03	.43	1.59	.41	5.49***
Play Seriously	8.03	1.61	5.98	2.86	- 3.70***
Chip Profit	941	179,057	-102,282	226,332	-2.10*
Win/Loss Score	-11.86	8.35	-18.94	11.57	-2.92**
Risky Calls ^c	.01	.02	.05	.04	4.08***
Conservative Folds ^c	.04	.03	.06	.04	1.12

Note: NA = negative affect; PA = positive affect; All poker play variables are calculated for play across whole session.

^a *n* = 34 ; ^b *n* = 35; ^c *df* = 32, *n* = 16 for Experienced, *n* = 18 for Less Experienced

[†] = *p* < .10 * *p* < .05 ***p* < .01 ****p* < .001

Time 3 to Time 4. In sum, the mood induction procedures were initially effective, but were not maintained throughout the playing session. Thus, further analyses will be split up into time chunks: within the first 20 minutes of play and during the last 30 minutes of play.

Preliminary Analyses.

Characteristics of Experienced vs. Less Experienced Players. Preliminary analyses were performed in the current study to examine any differences between experienced and less experienced players among variables of interest (See Table 14). As conducted in Study 1 and 2,

Experience scores were ranked in tertiles according to Experience level scores. The top third Experience level was again compared to the bottom third on variables by utilizing independent sample *t*-tests. Results revealed that those with more experience did not significantly differ from those with less experience with respect to baseline Positive and Negative Affect or Mood Regulation; though results were trending towards significance for Positive Affect and Mood Regulation. Similar to Study 2, more experienced players reported playing online poker, playing poker for real money (whether live or online) and playing online poker for real money more frequently than those with less poker experience. With respect to poker play variables, experienced players played significantly fewer poor hands pre-flop, made significantly fewer post-flop negative EV decisions and made significantly fewer post-flop decisions across the playing session than less experienced players. These results are consistent with Study 2. With respect to Task Performance, experienced players performed better across the session than less experienced players; experienced players profited more across the session and had significantly higher Win/Loss Scores than those less experienced. When asked how seriously they played during the poker task, more experienced players reported having played more seriously during the session than those with less experience. Lastly, more experienced players did not differ with respect to conservative folds; however, experienced players made fewer Risky Calls that disagreed with the suggestions of the Odds Information software.

Bivariate Relations. Zero-order correlations between affect, experience and poker play variables are depicted in Table 15. As the effects of the mood induction procedures did not last beyond the first 20 minutes of play, analyses utilized poker risk indices calculated from the first 20 minutes of poker play. More experience was associated with playing less negative EV hands pre-flop (Pre-flop Risk) in all conditions (Pearson *r*'s ranging from -.29 to -.63), with the

exception of the Neutral Mood/Odds Info condition (the direction of relationship was consistent with other conditions though it did not reach significance). Likewise, more experience was associated with fewer post-flop decisions (Post-flop Risk B) in all four conditions, with Pearson r values ranging from $-.33$ to $-.61$. However, poker experience was unrelated to the number of post-flop negative EV decisions (Post-flop Risk A), with the exception of a marginal negative relationship in the Negative Mood/No Odds Info group.

Table 15 illustrates the bivariate relationships between post-induction affect and risk-taking during the first 20 minutes of play. In both negative mood conditions, higher post-induction (Time 2) Negative Affect scores were associated with making more negative EV post-flop decisions (Post-flop Risk A). In the Negative Mood/ No Odds Info condition, higher post-induction Negative Affect scores were also associated with choosing to play poorer hands pre-flop and making more post-flop decisions. Though the direction of the relationship was similar (positive), the above relationships did not emerge as significant in the Negative Mood/ Odds Info group. In both negative conditions, higher post-induction Positive Affect scores were associated with making fewer post-flop decisions. In the Negative Mood/ Odds Info condition, higher post-induction positive affect scores were also associated with choosing to play poorer hands pre-flop and making more post-flop negative EV decisions. Though the direction of the relationship was similar (negative), the above relationships did not emerge as significant in the Negative Mood/ No Odds Info group. In the Neutral Mood/ No Odds Info condition, higher post-induction Negative Affect scores were associated with playing a larger proportion of poor starting hands pre-flop and making more post-flop decisions (marginal significance).

Table 15

Descriptives and Zero-Order Correlations of Affect, Experience and Poker Play Variables within each Condition

Measure	1	2	3	4	5	6	7	8	M	SD
Negative Mood/ Odds Info										
1. Post NA	-	-.59**	.04	.29	.52**	.27	-.13	-.00	3.45	2.13
2. Post PA		-	.24	-.43*	-.52**	-.49*	.14	.06	5.51	2.13
3. Experience			-	-.44*	-.08	-.46*	.21	.42*	2.20	.64
4. Pre-flop Risk (First 20)				-	.51**	.80**	-.17	-.19	.42	.19
5. Post-flop Risk (A) (First 20)					-	.41*	-.12	.15	.13	.14
6. Post-flop Risk (B) (First 20)						-	-.00	-.13	1.33	.53
7. Amount Won							-	.76**	-42608	153,154
8. Win/Loss Score								-	-16.20	9.24
Negative Mood/ No Odds Info										
1. Post NA	-	-.37 [†]	-.41*	.45*	.50*	.43*	-.21	-.15	3.49	1.99
2. Post PA		-	.53**	-.34	-.32	-.43*	.19	.21	5.11	2.09
3. Experience			-	-.59**	-.31	-.55**	.30	.34	2.26	.62
4. Pre-flop Risk (First 20)				-	.48*	.88**	-.44*	-.51**	.48	.20
5. Post-flop Risk (A) (First 20)					-	.48*	-.32	-.06	.15	.14
6. Post-flop Risk (B) (First 20)						-	-.49*	-.46*	1.59	.60
7. Amount Won							-	.67**	-88,816	250,566
8. Win/Loss Score								-	-16.68	12.17
Neutral Mood/ Odds Info										
1. Post NA	-	-.44*	-.17	-.21	.04	-.09	-.10	.00	.69	1.13
2. Post PA		-	.38	.04	-.11	-.05	-.15	.02	7.51	1.16
3. Experience			-	-.32	-.17	-.33	-.05	.11	2.28	.54
4. Pre-flop Risk (First 20)				-	.36 [†]	.79**	-.00	-.13	.36	.21
5. Post-flop Risk (A) (First 20)					-	.26	.29	.47*	.16	.13
6. Post-flop Risk (B) (First 20)						-	.007	-.075	1.23	.48
7. Amount Won							-	.56**	-68,153	133,479
8. Win/Loss Score								-	-16.65	7.90
Neutral Mood/ No Odds Info										
1. Post NA	-	-.29	-.11	.44*	-.03	.35 [†]	.10	-.18	.70	.95
2. Post PA		-	-.02	-.29	-.12	-.08	-.40*	-.32	8.09	1.56
3. Experience			-	-.47*	-.14	-.59**	.24	.52**	2.37	.76
4. Pre-flop Risk (First 20)				-	.39*	.85**	-.04	-.27	.42	.21
5. Post-flop Risk (A) (First 20)					-	.36 [†]	.20	.11	.12	.11
6. Post-flop Risk (B) (First 20)						-	-.03	-.42*	1.29	.43
7. Amount Won							-	.71**	-38,108	220,785
8. Win/Loss Score								-	-17.04	10.70

Note. Pre-flop Risk = Percentage of negative EV hands played pre-flop ; Post-flop Risk (A) = Number of negative EV decisions over session; Post-flop Risk (B) = Total number of decisions made during over session.

** $p < .01$, * $p < .05$, [†] $p < .10$

Because poker experience was related to risk-taking in all conditions to a degree, partial correlations between affect and risk-taking were performed after controlling for poker experience. No changes emerged in the bivariate relationships between affect and risk-taking once the effects of poker experience were partialled out.

Investigating the Effects of the Manipulations on Decision-Making. Hypothesis 1 predicted that levels of risk-taking will significantly differ across mood conditions and Hypothesis 3 predicted that those with odds/expected value information during play will have lower risk-taking scores than those without access to such information. We investigated the above hypotheses in the present analyses.¹¹ The effect of the negative mood manipulation largely dissipated in the two negative mood conditions by 20 minutes into poker play. As a result, the poker risk indices were calculated (using same method as risk scores across the session) for play during a temporal window (i.e. first 20 minutes) when the effects of the mood induction on risk may presumably be stronger. All three risk indices were each subjected to a two-way analysis of covariance (ANCOVA) with Mood Manipulation and Odds Manipulation entered as independent variables. Poker experience was entered as a covariate to examine the unique effects of the manipulations after controlling for a players' level of background knowledge. Each independent variable had two levels: Mood Manipulation (Negative Mood and Neutral Mood) and Odds Manipulation (Odds Information and No Odds Information). Preliminary analyses evaluating the homogeneity-of-regression assumption indicated that the relationships between the covariate and the dependent variables did not differ significantly as a function of the Mood Manipulation or Odds Manipulation. Thus, ANCOVA could be conducted for all three dependant variables.

¹¹ As found in Study 2, preliminary analyses indicated that groups did not significantly differ with respect to Task Performance. Additionally, those with and without access to Odds Information did not differ with respect to Task Performance.

Table 16
ANCOVA Results for the Effects of Mood Induction and Odds Information on Risk Indices during First 20-minutes of Play after Controlling for Experience

Predictor	Pre-flop Risk (First 20 Minutes)			Post-flop Risk (A) (First 20 Minutes)			Post-flop Risk (B) (First 20 Minutes)		
	<i>F</i>	<i>df</i>	η^2	<i>F</i>	<i>df</i>	η^2	<i>F</i>	<i>df</i>	η^2
Covariate									
Poker Experience	25.59**	1	.205	2.91 [†]	1	.029	30.22**	1	.234
Main Effects									
Mood Manipulation	2.11	1	.021	.01	1	.000	3.38 [†]	1	.033
Odds Manipulation	4.43*	1	.043	.23	1	.002	4.39*	1	.042
Interaction Effect									
Mood X Odds	.00	1	.000	1.46	1	.015	1.28	1	.013
Error		99			99			99	
R^2			.25			.05			.29
<i>n</i>			104			104			104

** $p < .01$, * $p < .05$, [†] $p < .10$

The results from the ANCOVA analyses are presented in Table 16. The ANCOVA was significant for Pre-Flop Negative EV Scores (first 20 minutes), $F(4, 103) = 8.05, p < .001$. A significant interaction between Mood Manipulation and Odds Manipulation was not found to indicate that levels of risk differed across the four conditions. Additionally, no main effect was found for Mood Manipulation. However, a main effect of Odds Manipulation was revealed, indicating that those without access to odds information ($M = .46$) chose to play a significantly higher proportion of negative EV hands dealt to them than those with odds information ($M = .38$). This effect accounted for approximately 4% of the variance in Pre-Flop Negative EV scores in the first 20 minutes of play. With respect to Post-Flop Negative EV scores (first 20 minutes), the ANCOVA was not significant for $F(4, 103) = 1.19, p = .32$. When predicting Total Decisions Scores (first 20 minutes), the ANCOVA was significant, $F(4, 103) = 9.95, p < .001$. The interaction term was not significant. However, a marginally significant main effect of Mood Manipulation was found. Those that had undergone a negative mood manipulation ($M = 1.44$)

had higher Total Decisions Scores than those that had undergone a neutral mood induction ($M = 1.28$). A main effect of Odds Manipulation was also found, revealing that those without odds information ($M = 1.45$) had higher Total Decisions Scores than those with access to odds information ($M = 1.28$) during the first 20 minutes of play, supporting Hypothesis 2. A Mood X Odds Info interaction was not found.

To investigate the effects of the manipulations further, risk scores were created for play during the first orbit around the table (first 9 hands). This was performed to capture risky play during an even closer temporal window to the mood induction. Risk indices were computed identically to the manner of those computed in the first twenty minutes, though only the first nine hands played were included in computations. All three newly computed risk indices were

Table 17
ANCOVA Results for the Effects of Mood Induction and Odds Information on Risk Indices during First Orbit of Play after Controlling for Experience

Predictor	Pre-flop Risk (First Orbit)			Post-flop Risk (A) (First Orbit)			Post-flop Risk (B) (First Orbit)		
	<i>F</i>	<i>df</i>	η^2	<i>F</i>	<i>df</i>	η^2	<i>F</i>	<i>df</i>	η^2
Covariate									
Poker Experience	5.85*	1	.056	2.62	1	.026	19.99**	1	.168
Main Effects									
Mood Manipulation	.92	1	.009	.29	1	.003	2.74	1	.027
Odds Manipulation	7.21**	1	.068	.10	1	.001	14.83**	1	.130
Interaction Effect									
Mood X Odds	.01	1	.000	.94	1	.010	4.57*	1	.044
Error		99			99			99	
R^2			.12			.04			.30
<i>n</i>			104			104			104

** $p < .01$, * $p < .05$

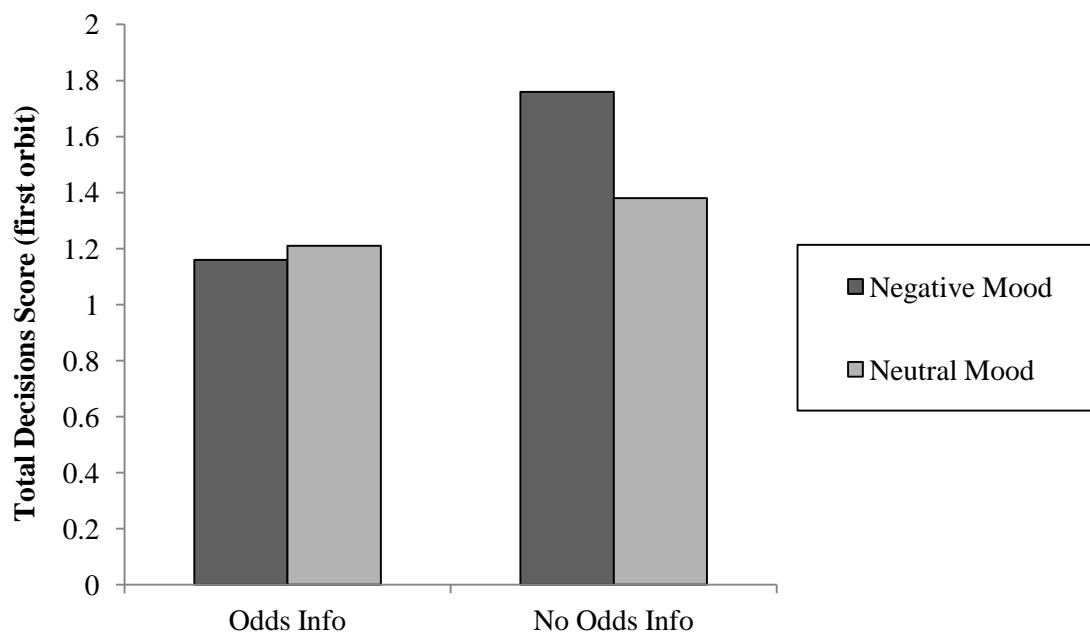


Figure 5. Graphical depiction of the interaction of Mood Manipulation and Odds Manipulation on Total Decisions scores after controlling for poker experience.

subjected to a two-way ANCOVA in a manner identical to the previous ANCOVAs predicting risk indices computed for the first 20 minutes of play. Again, preliminary analyses revealed that the homogeneity-of-regression assumption was not violated, indicating that ANCOVA analyses may proceed.

Table 17 presents the results of the three ANCOVAs. The ANCOVA was again significant for Pre-Flop Negative EV Scores (first orbit), $F(4, 103) = 3.41, p < .05$. No interaction effect was found. No main effect was found for Mood Manipulation. However, consistent with prior results, a main effect of Odds Manipulation was revealed. Those without access to odds information ($M = .45$) chose to play a significantly higher proportion of weak hands dealt to them than those with odds information ($M = .33$). This effect accounted for approximately 7% of the variance in Pre-Flop Negative EV Scores during the first orbit of play.

In line with previous analyses, the ANCOVA was not significant for Post-Flop Negative EV Scores during the first orbit of play, $F(4, 103) = .98, p = .42$. The ANCOVA predicting Total Decisions Scores (first orbit), was significant, $F(4, 103) = 10.38, p < .001$. A significant interaction was found between Mood Manipulation and Odds Manipulation. Figure 5 graphically depicts this interaction. To further explore this result, four planned comparisons were used to examine the hypothesized specific effects contributing to the interaction. The first three comparisons explored whether those who had undergone a negative mood induction without access to real-time odds had significantly higher Total Decisions Scores (first orbit) than those in each of the other conditions. Results from the comparisons revealed that those in the Negative Mood/No Odds Information ($M = 1.76$) condition had significantly higher Total Decisions Scores than those with Neutral Mood/No Odds Information, ($M = 1.35$), $F(1, 99) = 7.18, p < .01, d = .74$, Negative Mood/Odds Information, ($M = 1.19$), $F(1, 99) = 17.94, p < .01, d = 1.17$, and Neutral Mood/Odds Information, ($M = 1.21$), $F(1, 99) = 15.21, p < .01, d = 1.09$, conditions after controlling for Poker Experience. The last planned comparison examined whether those with access to odds information differed across Mood Manipulation. Results revealed that for those with access to odds information, those that had undergone a negative mood induction ($M = 1.19$) did not significantly differ from those that had undergone a neutral mood induction, ($M = 1.21$), $F(1, 99) = .11, p = .741, d = .10$, indicating that having access to odds/EV info during play buffers the effects of negative affect on risk-taking.

The Interaction of Affect and Experience in Decision-Making. The analyses conducted above examined the effect of the manipulations on risk-taking. The following analyses examine the interactive effect of the *degree* of affect and experience on risk-taking in decision-making within each condition. To test Hypothesis 4, six regression models were

performed. The results of these analyses are presented in Tables 18 and 19. As conducted in Study 1 and 2, post-induction Positive and Negative Affect were examined in separate analyses due to their moderate to large correlation coefficients (values of Pearson's r range from $-.29$ to $-.59$ across conditions between positive and negative affect). In Models 1, 2 and 3, post-induction Negative Affect and Poker Experience were entered in the first step and their interaction term was entered in the second step. Because the effect of the negative mood manipulation largely dissipated in the two negative mood conditions by 20 minutes into poker play, poker risk indices calculated for the first 20 minutes of play were utilized in the regression analyses. Prior to computing the interaction terms in all regression models, both variables were centered by subtracting the subjects raw scores on these variables from their mean score (West, Aiken & Krull, 1996).

A significant interaction was found for Model 1 in the Negative Mood/Odds Info condition. No other significant interactions were found for Models 1-6 in any condition. The interaction found accounted for 12% of the variance in Pre-Flop Negative EV Scores during the first 20 minutes of play (total $R^2 = 51\%$). To better understand this interaction, Poker Experience was dichotomized into high and low by splitting this variable into $+1$ and -1 SDs from the mean (West, Aiken & Krull, 1996). This relationship is depicted in Figure 6. It appears that Pre-Flop Negative EV Scores change little as a function of Negative Affect in those with a low degree of poker experience. Conversely, Negative Affect appears to be positively related to Pre-Flop Risk in those with a high degree of Poker Experience. To explore the significance of the individual slopes in this relationship, simple slopes tests were performed using ModProbe (Hayes & Mathes, 2009). Results from the tests revealed that the slope for those low in experience was not

Table 18
Hierarchical Regression of Post-Induction Negative Affect, Poker Experience and their Interaction on Poker Risk Indices by Condition

Predictor	Pre-flop Risk (Model 1)			Post-flop Risk (A) (Model 2)			Post-flop Risk (B) (Model 3)		
	ΔR^2	<i>B</i>	95% CI	ΔR^2	<i>B</i>	95% CI	ΔR^2	<i>B</i>	95% CI
Negative Mood/ Odds Information									
Step 1	.29*			.28*			.30**		
NA		.03 [†]	[-0.01, 0.06]		.04**	[0.01, 0.06]		.07	[-0.25, 0.23]
Experience		-.13*	[-0.23,-0.02]		-.02	[-0.10, 0.06]		-.40*	[-1.02,-0.07]
Step 2	.01			.00			.01		
NA x Experience		-.01	[-0.6,-0.03]		.00	[-0.03, 0.03]		.03	[-0.70, 0.72]
Total R^2	.30*			.28 [†]			.30*		
Neutral Mood/ Odds Information									
Step 1	.17			.03			.13		
NA		-.05	[-0.12, 0.02]		.00	[-0.05, 0.05]		-.07	[-0.24, 0.11]
Experience		-.14 [†]	[-0.29, 0.02]		-.04	[-0.14, 0.06]		-.32	[-0.67, 0.05]
Step 2	.00			.02			.07		
NA x Experience		-.00	[-0.13, 0.16]	.	.03	[-0.06, 0.13]		-.22	[-0.55, 0.11]
Total R^2	.17			.05			.20		
Negative Mood/ No Odds Information									
Step 1	.39**			.26*			.35**		
NA		-.01	[-0.01, 0.07]		.03*	[0.00, 0.06]		.08	[-0.04, 0.19]
Experience		-.31**	[-0.28,-0.03]		-.02	[-0.12, 0.07]		-.42*	[-0.80,-0.05]
Step 2	.12*			.02			.03		
NA x Experience		-.05	[0.01, 0.13]	.	.02	[-0.03, 0.07]		.09	[-0.11, 0.29]
Total R^2	.51**			.28 [†]			.37**		
Neutral Mood/ No Odds Information									
Step 1	.37**			.02			.43**		
NA		.09*	[0.01, 0.16]		-.01	[-0.06, 0.05]		.13 [†]	[0.02, 0.28]
Experience		-.12*	[-0.21,-0.02]		-.02	[-0.09,-0.04]		-.32**	[-0.50,-0.13]
Step 2	.00			.08			.00		
NA x Experience		.03	[-0.18, 0.24]	.	.09	[-0.05, 0.23]		.06	[-0.36, 0.48]
Total R^2	.37*			.10			.43**		
<i>n</i>	157			162			129		

Note. NA = post-induction negative affect; all risk indices are calculated for play during first 20-minutes.

** $p < .01$, * $p < .05$, [†] $p < .10$

Table 19

Hierarchical Regression of Post-Induction Positive Affect, Poker Experience and their Interaction on Poker Risk Indices by Condition

Predictor	Pre-flop Risk (Model 4)			Post-flop Risk (A) (Model 5)			Post-flop Risk (B) (Model 6)		
	ΔR^2	<i>B</i>	95% CI	ΔR^2	<i>B</i>	95% CI	ΔR^2	<i>B</i>	95% CI
Negative Mood/ Odds Information									
Step 1	.30*			.27*			.37**		
PA		-.03 [†]	[-0.06, 0.00]		-.04*	[-0.06, 0.01]		-.10*	[-0.19,-0.01]
Experience		-.10 [†]	[-0.21,-0.00]		-.01	[-0.07, 0.10]		-.31*	[-0.60,-0.01]
Step 2	.05			.09			.06		
PA x Experience		-.04	[-0.10,-0.02]		-.04	[-0.09, 0.01]		-.13	[-0.31, 0.04]
Total R^2	.36*			.36*			.43**		
Neutral Mood/ Odds Information									
Step 1	.13			.03			.11		
PA		.03	[-0.05, 0.11]		-.01	[-0.13, 0.10]		.04	[-0.15, 0.22]
Experience		-.15	[-0.32, 0.02]		-.02	[-0.01, 0.03]		-.33	[-0.72, 0.07]
Step 2	.01			.00			.00		
PA x Experience		-.06	[-0.28, 0.15]		-.00	[-0.05, 0.05]		-.08	[-0.59, 0.44]
Total R^2	.14			.03			.11		
Negative Mood/ No Odds Information									
Step 1	.34*			.12			.32*		
PA		-.00	[-0.05, 0.04]		-.02	[-0.05, 0.02]		-.05	[-0.18, 0.07]
Experience		-.18*	[-0.32,-0.04]		-.04	[-0.15, 0.07]		-.42*	[-0.83, 0.01]
Step 2	.04			.03			.00		
PA x Experience		-.04	[-0.11, 0.03]		-.02	[-0.07, 0.03]		-.01	[-0.22, 0.20]
Total R^2	.38*			.15			.32*		
Neutral Mood/ No Odds Information									
Step 1	.31*			.04			.36**		
PA		-.04 [†]	[-0.09, 0.01]		-.01	[-0.04, 0.02]		-.03	[-0.12, 0.07]
Experience		-.13*	[-0.23,-0.03]		-.02	[-0.09, 0.04]		-.34**	[-0.53,-0.14]
Step 2	.00			.09			.00		
PA x Experience		-.01	[-0.06, 0.05]		-.03	[-0.01, 0.06]		-.01	[-0.13, 0.10]
Total R^2	.31*			.13			.36*		
<i>n</i>	157			162			129		

Note. PA = post-induction positive affect; all risk indices are calculated for play during first 20-minutes.

** $p < .01$, * $p < .05$, [†] = $p < .10$

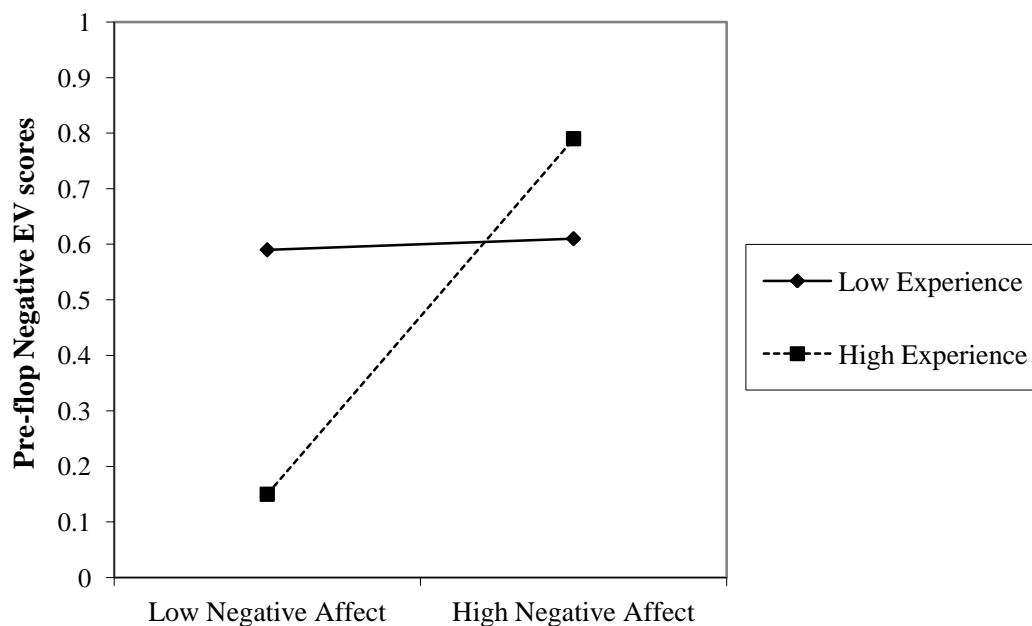


Figure 6. Graphical depiction of the interaction of negative affect and poker experience on Pre-flop Negative EV scores in the Negative Mood/No Odds Info condition.

significantly different from zero ($b = .00, p = .93$). However, the slope was significantly different from zero for those high in poker experience ($b = .08, p < .05$) condition.

Models 1 to 6 were not significant in the Neutral Mood/ Odds Information condition. Thus, neither Affect nor Experience significantly predicted risk during the playing session in any condition. Significant main effects emerged in the other three conditions (Negative Mood/Odds Info, Negative Mood/No Odds Info, Neutral Mood/ No Odds Info). Experience emerged as a significant predictor in Models 1, 3, 4 (marginal in Negative Mood/Odds Info condition) and 6 (predicting Pre-flop Negative EV Scores and Total Decisions scores) in all three conditions. A higher level of experience was associated with lower risk scores. Experience did not emerge as a significant predictor in Models 2 and 5 in the three conditions (predicting Post-flop Negative EV Scores). Negative Affect emerged as a significant predictor of both Pre-Flop Negative EV Scores

(marginal) (Model 1) and Post-flop Negative EV Scores (Model 2) in the Negative Mood/Odds Info condition. A significant main effect of Negative Affect also emerged when predicting both Pre-Flop Negative EV Scores (Model 1) and Total Decisions Scores (Model 3) in the Neutral Mood/No Odds condition. Lastly, Negative Affect significantly predicted Post-Flop Negative EV Scores (Model 2) in the Negative Mood/No Odds condition. A higher degree of Negative Affect was associated with higher risk-taking scores. Positive Affect emerged as a significant, negative predictor of all three risk indices (Models 4-6) in the Negative Mood/ Odds Info condition. Positive affect also significantly predicted Pre-Flop Negative EV Scores (Model 4) in the Neutral Mood/ Odds Info condition.

Discussion

This last study aimed at further exploring the predictions of the AIM. Additionally, it appeared warranted to test the role of odds information in decision-making. After having made several methodological changes in the current study, a number of hypotheses were examined. The first three hypotheses pertained to the manipulations used in the current study. As hypothesized in Study 1 and 2, we proposed a significant difference in risk-taking across mood conditions. Utilizing ANCOVA analyses, evidence emerged of a main effect of mood on the number of decisions made in the first 20 minutes of play. Evidence did not emerge for a main effect of mood in the other risk indices. Thus, Hypothesis 1 was partially supported and was consistent with the predictions of the MMH. One of the main aims of the current study was to test whether having access to odds and expected value information influenced decisions during game play. The results revealed that those with access to odds/EV information played significantly fewer weak hands pre-flop in the first orbit and first 20 minutes of play than those without access. Similarly, those with odds/EV information made significantly fewer decisions in

the first 20 minutes of play. We did not see this effect when predicting negative EV decisions post-flop. These results fully supported Hypothesis 2 and were consistent with the work of Samanez-Larkin, Wagner and Knutson (2011). Analyses further revealed a significant interaction between the Mood and Odds Information conditions when predicting total number of decisions made during the first orbit. As predicted in Hypothesis 3, those in the negative mood condition without access to odds/EV information had the highest total number of decisions in the first nine hands, even after controlling for experience.

As predicted in Study 1 and 2, it was hypothesized that experience would moderate the relationship between affect and risk-taking. A significant interaction of Negative Affect and Experience on pre-flop negative EV was found in the Negative Mood/No Odds Info condition. The nature of this interaction was not consistent with the findings of Study 1 and 2. Our hypothesis predicted that the decisions of more experienced players would be less infused with affect than those with less experience. It appeared that this relationship displayed the opposite effect; the decisions of those with more experience appeared more affected by negative affect than those with less experience. Those with less experience appeared to play a fairly high proportion of weak hands dealt to them pre-flop and this was unaffected by negative affect. When negative affect was low, more experienced players appeared to play very few weak hands dealt to them. However, when negative affect was high, experienced players played a higher proportion of weak hands dealt to them.

CHAPTER FIVE

GENERAL DISCUSSION

The current research program identified several gaps in the mood and decision-making literature. First, many of the past methodologies used in the decision-making literature have lacked ecological validity and doubts have been expressed with respect to their generalizability to naturalistic decision-making. Second, background knowledge was not taken into account in decision research; a factor heavily implicated in naturalistic decision-making. Third, the AIM was put forth as a theoretical framework to consolidate the mixed findings in the mood and risk-taking literature, yet little research has been conducted to test its predictions. Using a novel decision task methodology, we investigated the effects of mood on risk-taking in a decision context that allowed for the accumulation of background knowledge and experience. We tested the predictions of the AIM in all three studies. We also included an odds information component in the third study to test whether providing such information would encourage more optimal decision-making. The goals and findings of the present research will be discussed, as well as their implications.

Direct Effects of Mood on Decision-Making

One of the main goals of the present research was to examine the direct effect of mood on decision-making. Therefore, mood was manipulated in all three studies prior to the introduction of a decision task. It was hypothesized that risk-taking in decision-making would significantly differ across mood conditions. The results obtained in the present research program partially supported the hypothesis and results obtained in past studies (Chou, Lee & Ho, 2007; Forgas, 1999; Isen & Patrick, 1983; Isen & Geva, 1987; Leith & Baumeister, 1996; Mittal & Ross, 1998; Yuen & Lee, 2003). In Study 1, mood was inducted online prior to participants completing a

decision task consisting of chance-based and poker-based hypothetical scenarios. Shifting from an online sample that utilized hypothetical decision scenarios, Study 2 induced mood in a laboratory setting prior to a real-time, poker decision task. No evidence of group differences in decision-making across mood conditions was found in Study 1 and 2. In Study 3, the methodology of Study 2 was improved upon with the introduction of a prize incentive. It was expected that the introduction of an incentive may further increase the ecological validity of the design and help reveal group differences in risk-taking across mood conditions. Results in Study 3 revealed that those in the negative mood conditions had a higher number of decisions in the first 20-minutes of play than those in the Neutral mood conditions. This result was marginally significant. The nature of this relationship was consistent with predictions of the MMH framework; negative affect is associated with increased risk-taking in decision-making.

Though this mood effect in Study 3 was marginally significant and should be interpreted cautiously, it was encouraging that a direct effect of the mood manipulation on risk was observed during play, validating the methodological changes made. This result is significant in that differences in decision-making across mood conditions were obtained in a skilled decision task that allowed participants to invoke background knowledge. This is the first attempt at investigating the direct influence of mood on risk-taking in such a context. A review of the mood and risk-taking literature revealed that what we know about the relationship between mood and risk in decision-making, is largely the result of studies in which the decision task is either hypothetical or simplified. Additionally, the number of decisions made and choice options given were often limited to a prescribed amount (i.e. two choice options). In a given session, a participant in Study 2 or 3 could make hundreds of decisions, depending on how many hands they chose to be involved in. The timing of the decision tasks in past research is also often brief,

in contrast to the 50-minute playing session of our participants in the current research. Additionally, there is little uncertainty involved in the decision tasks given in past research as the exact parameters of a decision are presented (i.e. 50% chance of winning) and exact potential losses and wins are illustrated to the participant. The consequences of our decisions outside of laboratory almost always carry a level of uncertainty, as we are interacting with our often unpredictable environment. In the present research, participants made numerous decisions under uncertainty, as they were playing against other human beings. It is a dynamic, non-contrived process as the person interacts with other, often unpredictable, players. The dynamic nature of this decision environment, that allows for the invocation of background knowledge, was one of the major strengths of the present research, as it was more akin to naturalistic decision-making (Huber, 1997). Future directions in mood and risk-taking research needs to account for the accumulation of experience and explore decision-making in more naturalistic settings.

The present research program examined the direct effect of mood on risk-taking in decision-making across the three studies. Analyses yielded inconsistent results across the three studies with respect to the effects of the mood manipulations on decision-making. A number of factors may allow for a better understanding of these inconsistent findings. First, one potential explanation for the insignificant findings in Study 1 was the nature of the methodology. Though the online methodology successfully manipulated mood in the intended directions and had many advantages (i.e. more heterogeneous sample, access to a large poker playing population, convenience to participants), potential environmental confounds could not be controlled for that may have altered mood during the decision task. For example, participants may have been partaking in other activities while completing the decision tasks (i.e. listening to music, surfing the internet, watching television, talking to friends/family) that could have confounded the

effects of the mood induction. Though they were asked in the instructions to find a quiet place without interruption to complete the tasks, we had no ability to verify that the participants were interruption-free.

In Study 2, group differences were also tested and analyses yielded a null finding. These results occurred despite the design being more ecologically valid than that of Study 1. A closer look at Study 2 points to the possible influence of the endowment effect. The endowment effect refers to the finding in behavioural economics that individuals place a higher value on something that they own than on an identically valued object that they do not own (Kahneman, Knetsch & Thaler, 1990). In other words, once an individual “owns” an object or a good, the minimum amount of compensation they are willing to take to part with it is often more than the maximum amount they are willing to pay to gain that same object if they did not own it. This effect is said to occur via loss aversion, an established phenomenon in behavioral economics and psychology, in which “losses loom larger” in people’s minds than do gains (Kahneman & Tversky, 1979; 1984). Thus, individuals tend to be more concerned with avoiding loss than seeking gains. With respect to Study 2, the participants did not put up their own money to play. No real money was involved at all during their poker session. In fact, they had an endless supply of “play chips” that they had not earned themselves. In addition to not having “ownership” of the chips, Study 2 did not involve any competition with other study participants or incentive (i.e. prize based on performance) to play well, other than one’s own intrinsic motivation to do so. How might have both the endowment effect and lack of an incentive affected risk-taking in the second study? Positive and negative emotions can influence the endowment effect by either amplifying it or inhibiting it (Zhang & Fishbach, 2005). If our participants didn’t feel a sense of ownership of the poker chips they were playing with, it is possible that they may have valued them less and were

more willing to part with them (i.e. risk-seeking), and this may be further influenced by induced affect.

Some have argued that pay-offs don't necessarily have to be real (vs. hypothetical) in decision-making research to create valid results (Kuhberger, Schulte-Mecklebeck & Perner, 2002; Read, 2005), however a review of the literature in behavioral economics revealed that in studies of gambles with choices of varying risk, incentives were associated with lower risk-taking, whereas hypothetical pay-offs were associated with risk-seeking behaviour (Camerer & Hogarth, 1999). Incentives can also improve task performance and effort and reduce variance and outliers (via unmotivated participants) (Read, 2005). Most of the participants in Study 2 reported having played poker for real money in the past (likely their own money). Thus, the absence of an incentive and "ownership" of one's chips may have influenced the effects of the manipulations on decision-making. Evidence of a main effect of mood in Study 3, after having introduced an incentive, supports the above contention. Future research is needed to investigate the potential effect of incentives on mood and decision-making.

The Interaction of Affect and Experience in Decision-Making

The present research program also examined the predictions of the AIM. The AIM was created in an attempt to account for the inconclusive findings in the mood-judgment literature. Results supportive of the MMH framework have found a positive relationship between negative affect and risk-taking and a negative relationship between positive affect and risk-taking. Findings supportive of the information processing framework have found opposite results with respect to affect and risk-taking. By examining decision-making within a context that has opportunities for past experience, the current research program investigated the prediction that the more experience one has with a decision-making task, the less likely it is that mood will

influence or be “infused” in decision-making process. In all three studies, experience moderated the relationship between negative affect and risk-taking in decision-making. When this relationship was explored graphically, identical results were found in Study 1 and 2. As hypothesized, the decisions of more experienced players were unrelated to negative affect, illustrating low affect infusion. Also as expected, the decisions of less experienced players were significantly influenced by negative affect, illustrating a higher degree of affect infusion in information processing. These results fully support the hypothesis and predictions of the AIM. The replication of these findings in both a hypothetical decision task and a real-time, more naturalistic setting lends credence to the importance of background knowledge in decision-making and its interaction with affect.

It is likely that the low affect infusion observed in more experienced players was the result of direct access processing. The thousands upon thousands of poker hands that experienced players likely have played makes it probable that they have ran into the poker scenarios presented in the Study 1 and the hand situations encountered in Study 2 many times before; thus, they were able to produce the crystallized stored reactions to these scenarios as seen in direct access processing, regardless of their level of negative affect (Forgas, 1995). Additionally, the null relationship between affect and risk-taking in decision-making in experienced players would appear more indicative of direct access as it is the information processing strategy least affected by mood (Forgas, 1995). No study previously has illustrated evidence of direct access processing via the relationship between mood, experience and decision-making. Thus, the findings in Study 1 and 2 make a valuable addition to this literature.

Interestingly, a positive relationship between negative affect and poker risk-taking was found in those with less experience in Study 1 and 2. This ran counter to the AIM’s prediction

that those experiencing negative affect will have more deliberate and substantive information processing, resulting in lower risk-taking. Rather, the results were consistent with findings supportive of the MMH. Less experienced players may very well have been attempting to improve their mood by taking risks as predicted by the MMH; but given that Study 1 was a hypothetical scenario task with no real consequences or rewards to their decisions and Study 2 involved “play chips” with no real-world value, this may not represent the complete picture. One possibility is that negative moods were associated with non-optimal decision-making via self-regulatory failure (Leith & Baumeister, 1996). Rather than careful, rational thought, individuals experiencing negative affect yield to impulsive decisions (Fishbach & Labroo, 2007; Leith & Baumeister, 1996) and the result is foregoing a long-term optimal choice in favor of immediate, riskier outcomes. In fact, negative moods themselves can occupy cognitive attention, decreasing the amount of resources available for self-regulation and inhibitory behavior (Ward & Mann, 2000). This is not entirely at odds with the AIM. According to the AIM, the combination of a complex task and a lowered cognitive capacity leads to a more heuristic mode of processing rather than a more substantive, deliberate and rational one (Forgas, 1995). With respect to the decision tasks in both studies, less experienced poker players likely found both the hypothetical poker scenarios and actual online play more complex and difficult than those with more experience. Thus, the combination of negative affect, low experience and low cognitive capacity may produce the results observed in these two studies. Our results lend support to the explanatory power of the AIM in accounting for the variety of ways we make sense of information and come to decisions.

An unexpected result emerged in Study 3 and is worthy of discussion. More specifically, a significant interaction of negative affect and experience on Pre-flop Negative EV scores was

found in the Negative Mood/No Odds Info condition. When visualized graphically, the nature of this interaction was not consistent with the findings of Study 1 and 2. It appeared that this relationship displayed the opposite effect of those in earlier studies; the decisions of those with more experience appeared *more* affected by negative affect than those with less experience, in contrast to our predictions. The graphical depiction suggested that those with less experience played a fairly high proportion of weak hands dealt to them pre-flop and this was unaffected by negative affect; whereas, those with more experience played a very low proportion of weak hands pre-flop when negative affect was low and a high proportion when negative affect was high.

At the outset, it appeared as though predictions were not supported in Study 3 with respect to the AIM. However, this result may still be consistent with the AIM after all. The AIM also predicts that when a judgmental target is familiar and relevant and/or important to an individual, a motivated processing strategy can occur (Forgas, 1995). Why might these seemingly opposing results have emerged in Study 3? One possibility was the unanticipated differences in personal relevancy invoked between Study 3 and the earlier studies. One might assume that taking part in a poker session with an incentive to win tickets for a valuable subscription to an online poker learning forum (headed by one of the top poker professionals in the world) would be quite relevant to an experienced poker player. As illustrated in both Study 2 and 3, experienced players were more likely to play online poker and play poker for real money than those less experienced. When they did play online poker, experienced players played online for real money more frequently than those less experienced. In other words, more experienced players are more accustomed to playing in a context that involves incentive and real-world reward. Thus, it wouldn't be a stretch to suggest that the hypothetical poker task in Study 1 and

“play money” session in Study 2 wouldn’t be particularly relevant to experienced players and the decisions they illustrated were “stored” reactions (Forgas, 1995). This further supports the suggestion that the results observed in Study 1 and 2 with respect to experienced players may have been indicative of direct access processing. Though it can’t be definitively confirmed in the present research, the finding that experienced players reported playing the session significantly more “seriously” in Study 3 than their less experienced counterparts further supports the above contention. A motivated processing strategy is a low affect infusion strategy in information processing, though more influenced by affect than direct processing. Moods themselves, (i.e. induced negative affect) serve as motivations for action or goal-directed information gathering, i.e. mood repair/maintenance, though don’t necessarily “colour” the judgment process directly (Forgas, 1995). Thus, experienced players with high induced negative affect may have been attempting to repair their mood by taking risks that they otherwise would not have taken had their negative affect been lower. With chips having a real value, as they represented a prize that was likely relevant to them, paired with an experience of high negative affect, experienced players may have opted to get involved in many hands to turn their mood around.

Although the presence of relevancy, paired with self-regulatory failure and/or mood repair, is a valid explanation for the results found in Study 3 for more experienced players, what can explain the results found for less experienced players? Less experienced players played a high proportion of weak hands dealt to them regardless of level of negative affect. In other words, they played poorly regardless of how they were feeling. It is unclear if the incentive was irrelevant to less experienced players, though their in-game decisions appeared more influenced by negative affect in the absence of an incentive (i.e. Study 2). Perhaps “play chip” or free game play was more salient and relevant to less experienced players as this is the type of game play

they were more accustomed to? Indeed, an individual's perceived value of an incentive depends on the extent to which it is congruent with one's goals (Shah, Higgins, & Friedman, 1998). In Study 3, experienced players reported playing more seriously than their less experienced counterparts. This implies more effort to play well on the part of experienced players than those less experienced, with the incentive serving to bolster interest. One possibility is that the introduction of the incentive in Study 3 impaired intrinsic motivation in inexperienced players, perhaps undermining the relevancy of the task and their persistence and/or effort. A lack of effort may imply a lack of care about play outcomes, regardless of how one feels; in other words, creating a divide between one's emotions and one's decisions. Indeed, the introduction of a reward or incentive, particularly in performance-contingent rewards (rewards given based on task performance), can undermine intrinsic motivation in tasks individuals previously considered interesting (i.e. less task persistence, effort) (Deci, Koestner & Ryan, 1999). When one is intrinsically motivated toward an activity, one is taking part in it for its own sake, i.e. for internal enjoyment or interest. In contrast, one is extrinsically motivated when taking part in an activity as a means to obtain an external goal, i.e. financial gain. It is likely that experienced players have both intrinsic and extrinsic motivations toward playing. Another possibility for our findings in less experienced players is with respect to task difficulty and complexity. A review of the incentive literature in laboratory tasks has found that the positive effects of incentives on performance are reduced as a task becomes more complex and difficult (Bonner, Hastie, Sprinkle & Young, 2000). It is likely that less experienced players found various decisions in hands more difficult and complex than more experienced players. Experienced players, by virtue of being in many hands situations before and having a wealth of background knowledge, can reproduce stored reactions to past situations. Less experienced players do not have a large knowledge base

to allude to during game play. We cannot definitively say whether motivation or task difficulty/complexity can account for our findings in Study 3 and more research is needed to elucidate the processes responsible for our findings.

The Effect of Odds/EV Information on Decision-Making

Another main goal of the present research was to examine whether providing real-time odds/expected value information influenced decision-making. In Study 3, participants in the experimental condition were given access to odds/EV information during game play. It was hypothesized that having access to expected value information during play would influence decision-making by decreasing risk-taking. Results provided evidence of a main effect of Odds Information on risk-taking. In other words, those provided with real-time odds/EV information during the game played fewer weak hands pre-flop in the first 20-minutes of the session than those without access to this information. These results were also replicated during the first orbit of play. Those with access to odds/EV information also made significantly fewer decisions than those without access during the first 20-minutes of play. Despite research that suggests statistics or odds information may be ignored in decisions under uncertainty (Steenbergh, Whelan, Meyers, May & Floyd, 2004; Delfabbro, Lahn & Grabosky, 2006; Denes-Raj & Epstein, 1994; Fiske & Taylor, 1991; Ranyard & Charlton, 2006; Williams & Connolly, 2006), the results of the current study suggest otherwise in a dynamic decision environment such as poker and fully supported our prediction. Instead results emerged that were consistent with the findings of Samanez-Larkin, Wagner and Knutson (2011), indicating that providing expected value information can aid decision-making and encourage optimal decisions.

The above results are quite significant in that the choice to enter a pot with particular starting hand begins the decision-making process in poker and is a very important aspect of play.

Starting hand values can often dictate the success of one's short and long term prospects, particularly when skill and/or stakes are lower. Additionally, making more decisions implies that one is playing many hands and/or getting deeply involved (i.e. playing more streets) in the hands one plays. As mentioned previously, getting involved in too many hands and going to hand showdowns too often is risky as the hands need to be strong enough to hold up at show down. As the majority of starting hands dealt are weak (i.e. negative EV), a person getting highly involved in hands with weak cards in multiple hands will likely lose often.

In addition to looking at the main effects of providing odds/EV information, an interaction between the Mood and Odds information manipulations was also predicted. Specifically, it was expected that those in an induced negative mood, without access to odds/EV info, would play riskier than all other conditions. Analyses revealed a significant interaction of Mood and Odds Information manipulations on the number of decisions made in the first orbit. As predicted, those in a negative mood, without access to real-time odds/EV information, made significantly more decisions in the first orbit of play. Of particular note, those that were in the negative mood condition with access to odds did not significantly differ from either neutral condition (with or without access to odds). This indicates that having access to odds/EV information while playing buffered the effects of negative affect on decision-making. Past research has found that decision aids during play can help combat other effects that may impair decision-making. For example, Phillips and Ogeil (2007) had their participants play blackjack before and after drinking alcohol. They provided their participants with a decision aid during play that displays basic advice for blackjack optimal strategy. They found that the decision aid increased players' optimal play during impairment from alcohol. The more impaired the players were, the more they relied on the aid. While not suggesting that those experiencing negative

affect are cognitively impaired, research has asserted that negative affect can occupy attentional resources (Ward & Man, 2000) and lead to self-regulatory failure (i.e. self-defeating behavior, impulsivity) (Leith & Baumeister, 1996) in a decision context. Perhaps the explicit information in front of them while they play curbs the effects of sub-optimal information processing strategies? In times of cognitive fatigue, the information may serve as a tool the decision-maker can rely upon when needed. In times of self-regulatory failure, when efforts at mood regulation have failed, the information may serve as a deterrent or a reminder to slow down. These results, as a whole, suggest that a decisional aid such as Hold'Em Indicator or something similar may be helpful during game play and may encourage optimal decision-making. In a game where one's win odds can change from moment to moment and mistakes can be very costly, any tool or skill that can aid in decision-making is very beneficial indeed. Future study is needed to explore other decision contexts that may benefit from a decision aid that displays expected value information. Additionally, individual difference variables can be explored that affect how an individual interprets and understands numerical information when making affectively charged decisions. For example, the work of Peters and colleagues (2006) in numeracy or numerical ability would be a fruitful avenue of future research in the context of the present findings, as their research has illustrated that more numerate individuals are less susceptible to emotionally charged framing effects in decision-making.

Experienced vs. Less Experienced Players

Preliminary analyses was conducted in each study to examine any potential differences between experienced and less experienced poker players as the role of experience appeared prominent in such a decision context. The results revealed some very interesting findings. In Study 1, results of independent *t*-tests in the online sample revealed that experienced players had

significantly higher mood regulation and baseline positive affect scores and lower baseline negative affect scores. A trend toward significance was found in Study 3 with respect to positive affect and mood regulation. These results in Study 1 are worthy of note as they indicate that experienced players were already feeling better than less experienced players before the task began. Additionally, these individuals reported being able to regulate their moods to a higher degree than less experienced players. The method of recruitment in Study 1 via online poker-interest message boards allowed for a more heterogeneous sample, resulting in a group of more experienced poker players. A portion of individuals identified ($n = 54$) themselves as professional poker players. Additionally, the sample was recruited from poker interest message boards, presupposed a sample from a population of players motivated to learn about and discuss poker. Indeed, research has illustrated that online poker forums are viable mediums for the building of skills and proficiency in poker (Parke & Griffiths, 2011; Leary & Carroll, 2012). It may be that highly experienced players may have gained experience in mood regulation simply by virtue of practicing mood regulation in their countless hours of game play. Similarly, they may have become accustomed to “prepping” themselves emotionally before a poker session (or poker decision task) to regulate their emotions before playing; which may account for the baseline affect findings. However, it may also be possible that individuals skilled at emotion regulation would be highly drawn to poker and may lead to persistence with the game. Those better able to regulate their moods during play may find success in the game and may pursue poker more intensely. This area of inquiry appears to be a significant avenue for future research. The way that individual differences in mood regulation interact with experience, whether better mood regulation is an antecedent to highly experienced play or a consequence of it, warrants further inquiry.

The preliminary analyses also revealed significant differences between experienced and less experienced participants with respect to decision-making in all three studies. In Study 1, more experienced players had significantly lower Poker Risk-Taking and higher Chance Risk-Taking¹² than those with less experience. In Study 2 and 3, more experienced players played significantly fewer negative EV hands pre-flop, made fewer post-flop decisions with negative EV and made fewer decisions across the session than their less experienced counterparts. In other words, experienced players made better, more optimal decisions both in hypothetical scenarios and during actual poker play. Moreover, when given explicit odds/EV information in Study 3, experienced players made significantly fewer Risky Calls than less experienced players. In other words, when the software suggested that a fold would be optimal (i.e. that to call would have a negative expectation), less experienced players tended to call more frequently than more experienced players.

Not only are there decisional differences between experienced and less experienced players, performance differences also emerged. In both Study 1 and 2, more experienced players had significantly higher Win/Loss Scores than less experienced participants. Thus, experienced players tend to win to a larger degree than they lose either in frequency and/or magnitude of wins to losses. This is supportive of anecdotal knowledge in poker circles that experienced and skilled players know how to maximise wins and minimise losses. These results are also consistent with recent research conducted by Siler (2010). After having tracked and analyzed millions of actual real-money hands on a popular online poker site with Poker Tracker software across low, medium and high stakes games, an unanticipated result emerged. Win-rate (i.e. percentage of hands won of hands played) was *negatively* associated with actual profits in lower stakes games.

¹² As mentioned previously in Study 1 results, poker experience was positively related to income. It's likely they saw that the Chance options were identical with respect to expected value, and opted for the larger, less sure payout. Similarly, less experienced players, having lower incomes, likely went for the surer, less uncertain options.

Lower stakes games are where inexperienced players typically start out. This result largely dissipated in higher, more skilled stakes. Thus, though lower stakes players tended to win more small pots, the magnitude of their losses were quite large – putting them in the red. Our Win/Loss Score variable takes into account both the frequency of wins/losses, but also their magnitude; both are important in determining a player's success. In terms of actual chip profit, experienced players did not differ from less experienced players in Study 2. However, with the inclusion of an incentive in Study 3, more experienced players actually performed better than less experienced players in terms of profit at the end of their playing session. In sum, our results are consistent with previous research illustrating that poker is a game that allows individuals to build skill through experience (DeDonno & Detterman, 2008; Fiedler & Rock, 2009). While experience does not necessarily equate with skill, one can build one's skills through practice, persistence and analysis, an aspect inherent in our poker experience measure. The creation of a self-report poker experience measure that can predict both decision-making and performance in both hypothetical and live poker decision tasks has contributed to an increased understanding of concepts that affect the decisions that players actually make.

Theoretical Contributions of the Research Program

Past research in risky decision-making has done so primarily via simple gambles or hypothetical scenarios. The present research has contributed to the decision-making literature by examining decisions made under uncertainty using a novel methodology in a dynamic, naturalistic decision environment. Further, the design utilized in the present research program allowed for a robust analysis of the phenomena in question. The natural progression of the decision contexts from hypothetical scenarios to a real-time decision task with improved ecological validity allowed for self-replication of our analyses; increasing the confidence in the

conclusions drawn. Utilizing poker play as a decision task and the quantification and operationalization of risk in decisions in this context has not been performed previously. Participants played poker online against players from all over the world during their laboratory session. Thus, the context of the decision task was similar to online poker play at home on one's own computer by using identical or similar software to what one plays online poker with (the majority of our participants had played online poker before). Although laboratory settings have been criticized for lacking ecological validity with respect to decision-making research (i.e. Raynard & Charlton, 2006), one of the strengths of the current research program was the use of commonly-used, online poker software. Additionally, research in the decision-making domain has omitted background knowledge from decision tasks; experiments using simple gambles are specifically designed to prevent experience gathering (Huber, 1997). Indeed, knowledge-based decision strategies have been largely absent from research in decision theory (Raynard & Charlton, 2006). However, the decisions we make day-to-day are heavily influenced by background knowledge; thus, the inclusion of knowledge and experience in decision research is more akin to naturalistic decision-making. Therefore, a further contribution to the decision literature was assessing risk in decision-making in a task that allows for the accumulation of background knowledge and experience. Indeed, the development of a poker experience measure that predicts both the decisions players make and how they perform was a valuable, additional contribution to the gambling and decision research literature.

The current project also contributed to the mood and risk-taking literature in several ways by examining the influence of mood on decision-making in a context that allows for experience. First, the inclusion of task experience allowed the predictions of the AIM to be tested in a dynamic, decision environment. The AIM consolidates the mixed findings in the mood and risk-

taking literature by distinguishing among factors that encourage and discourage affect infusion in the decision process. Despite predicting that decision task familiarity/experience influences information processing strategies, there was a paucity of research testing the AIM's predictions related to affect and experience in decision-making. The current research program added greatly to the literature by providing support in Study 1 and 2 for the AIM's prediction that the decisions of those more experienced would be less infused with affect. Our results in Study 3 further qualified this relationship by task relevance and identified an avenue for future study. Second, the current research also contributed to the mood and risk-taking literature with the inclusion of a negative mood condition. There has only been a handful of studies examining the effects of negative mood on risk-taking in decision-making (Yuen and Lee, 2003). The present results add to this literature. Only the effects of negative affect on risk-taking emerged in the present findings; consistent with the established phenomenon of the asymmetrical effects of negative and positive stimuli in psychology research literature (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001). Indeed, the lack of significant findings with respect to positive affect speaks to the importance of including negative affect in mood-risk research.

Traditional decision theory asserted that decision-makers will make the most optimal, rational choice out of a set of options (Edwards, 1954). Thus, if individuals are faced with a choice, they should make the choice with the highest expected value. Research in the last half century has indicated that decision-makers often ignore basic statistics in decisions (Fiske & Taylor, 1991). Specifically, the expected value of a decision is often not considered in simple gambles research (Lichtenstein, Slovic & Zink, 1969; Montgomery & Adelbratt, 1982). Moving away from simple gambles, the current research tested whether expected value information would reduce risk-taking in a dynamic, naturalistic decision task. With the inclusion of the Odds

Information condition in Study 3, half of the sample had access to expected value information during play. They were given explicit information about starting hand values in real-time as they played, odds of winning and making certain hands by the river. The current research demonstrated that expected value information is not ignored in all contexts, and may actually help individual make better, more optimal decisions. This result adds to the decision-making literature and opens up the possibility of utilizing expected value information in skilled, decision tasks as a decision aid.

Limitations and Future Research

Despite the strengths and contributions of this research program, several limitations were noted. First, Study 1 and 2 were particularly time intensive in terms of participant sessions, data preparation and coding; thus, the number of participants recruited was kept at a manageable number that could reasonably demonstrate effects yet still be kept logistically sound. Similarly, the time interval of playing time (50 minutes) was also limited by the above constraints. Thus, it was not possible to have participants play the hundreds, if not thousands of hands needed to truly get an idea of an individual's playing style and skill level. To build on the current findings, it may be fruitful to explore the relationship between mood, experience and decision-making in a poker-related diary study. One possible way to increase the sample size of hands played is to have participants play at home for a prescribed time interval (i.e. a week) and submit hand histories at the end of the study. Daily moods could be tracked similarly to other mood studies (i.e. Jose, Lim & Bryant, 2012). A few studies have tracked hundreds of thousands of poker hands via data mining techniques on online poker software (Fiedler & Rock, 2009; Siler, 2010; Smith, Levere & Kurtzman, 2009), though they have not assessed social and psychological

variables (i.e. mood, motivation) in conjunction to examine their relationship to experience, decisions and performance.

A second limitation was the inability to ascertain the thought processes of our participants during play to better understand how they came to the decisions they did. For example, the methodology did not allow us to know the range of hands our participants had put their opponents on. An opponent's range of hands is particularly important when calculating win odds and ultimately the EV of a decision. One potential avenue for future study would be having participants do a "think aloud" protocol (i.e. Hoppmann, 2009) to better understand how and why they come to the decisions they do. It would be particularly interesting to examine how the decision processes of experienced and inexperienced may differ. The recognition-primed decision model (Klein, 1999) may be an appropriate framework to utilize in this regard as it speaks to qualitative differences in decisions under timed pressure in experienced decision-makers. Third, an additional limitation was our primarily male samples. The vast majority of our participants were male in all three studies. This result is not surprising, given that poker is a very male-dominated domain. It is unclear whether our current results would be replicated in a more balanced sample as research has illustrated that males and females may have different risk propensities (Byrnes, Miller & Schafer, 1999). Lastly, we only captured mood at specific time points in the session; thus we could not capture the likely volatility in emotions as an individual played. The probable swings up and down from wins and losses as participants played likely influenced mood and ultimately their decisions. It would be interesting to measure mood more dynamically via a device such as a Continuous Response Digital Interface (Goins, 1998). This device allows the user to continuously turn a dial left or right on a negative/positive continuum in response to any changes in their emotions during a laboratory task. This would allow a

researcher to better track moods during a decision task; particularly in a dynamic and changing decision environment such as poker. Additionally, affect can further be distinguished in terms of the valence and arousal of positive and negative emotions (Russell, 1980). Differences between the effects of specific emotions on risk-taking have been found previously. For example, a high arousal negative emotion like anger can influence risk-taking differently than a lower arousal negative emotion such as sadness (Bodenhausen, Sheppard & Kramer, 1994). Lerner and Keltner (2000) demonstrated that specific emotions of the same valence can have very different appraisal-tendencies in relation to making risk perceptions and judgements. Anger, for example is associated with appraisals around certainty and blame for negative events and is associated with assessing situations as low risk, whereas fear can invoke appraisals of uncertainty and assessments of high risk. The effects of specific emotions were not explored in the present analyses; thus it would be worthwhile to explore the hypotheses in the current research while differentiating between valence and arousal of different specific emotions.

Several other potential avenues of future research were identified in this research program. Our results revealed an unexpected finding with respect to incentives, relevance, experience and decision-making. When comparing the results of Study 2 with study 3, the incentive in Study 3 appeared to reduce or diminish the effect of affect on decision-making in less experienced players. This was a surprising finding and was interpreted as a potential difference in relevancy between more experienced and less experienced players; a factor identified in the AIM as important in information processing. While a causal link between the introduced incentive in Study 3 and the contrasting findings cannot be confirmed in the present research, these results have identified a future direction for further study. It would be interesting to manipulate relevancy and incentives to further examine their fit within the AIM as they relate

to experience and risk-taking in decision-making. To build on the findings in the current research, it would also be fruitful to test the predictions of the AIM in other decision tasks that allow for background knowledge, i.e. organizational settings, sports settings. It would also be meaningful to explore individual difference variables such as motivation for playing and mood regulation in the context of task experience. How do intrinsic and extrinsic motivation and experience interact to predict decision-making pattern? Is mood regulation developed and honed in experienced players or are individual's with high mood regulation drawn to persist in poker? Individual differences in information processing style can also be explored within the context of mood, experience and risk-taking in decision-making. For example, past research has found that a more rational thinking style is related to more optimal decision-making in hypothetical decision tasks (Bjorklund & Backstrom, 2008) and gambles (Pacini & Epstein, 1999) than a more experiential, and thus, emotionally driven processing style.

Applied Implications

The implications of the findings in present research program have some applied value. One important implication of the current research is in the problem-gambling domain. Though there are many skilled components to poker, some aspects of the game are chance-based; thus there is a gambling component to this game. As with any form of gambling, there is potential for problems to develop in a portion of the population. Negative affect has been implicated in the development of gambling problems in past research. Indeed, depression has been implicated as both a predictor and consequence of gambling addiction. In the current research, we found that the level of risk in decisions that people made was closely linked to how they were feeling. In general, the worse someone was feeling, the more likely they were to make risky, sub-optimal decisions. This relationship was further qualified by experience and incentive. Thus, the worse

you feel, the worse you play and the more you can lose. Chasing losses is evidence of gambling pathology and has been shown in even experienced poker players (Griffiths, Woods & Rigby). As we saw, more experienced players are particularly vulnerable to the effects of negative affect on decision-making when a real-world incentive was introduced. Thus, when real money is involved, the effects of poor mood can be quite costly. The skilled aspects of poker may further complicate the issue for individuals that develop a problem (Shead, Hodgins & Scharf, 2009) as skilled gambling activities are more amenable to cognitive distortions (i.e. illusions of control) and players can overestimate the skilled aspects of the game (Mitrovic & Brown, 2009). This presents a unique challenge for clinicians in gambling pathology.

The present findings also have implications in other domains such as sports psychology. The interplay of emotion and decisions within a sports game setting can have implications for athletes and their performance, particularly in team settings. The current findings also have implications in organizational settings. Decisions are made daily in work settings and the cost of these decisions can vary greatly depending on the occupation. For example, a frustrated doctor or pilot making a sub-optimal decision is far more costly than mistakes made in other work settings. These findings also have implications for the decisions individuals make in everyday contexts; i.e. deciding to pass a car in a non-passing zone, deciding which investments to make for one's retirement or deciding what medical treatment to pursue. How people feel is intimately involved with how they makes sense and interact with their environment and the world around them.

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APPENDICES

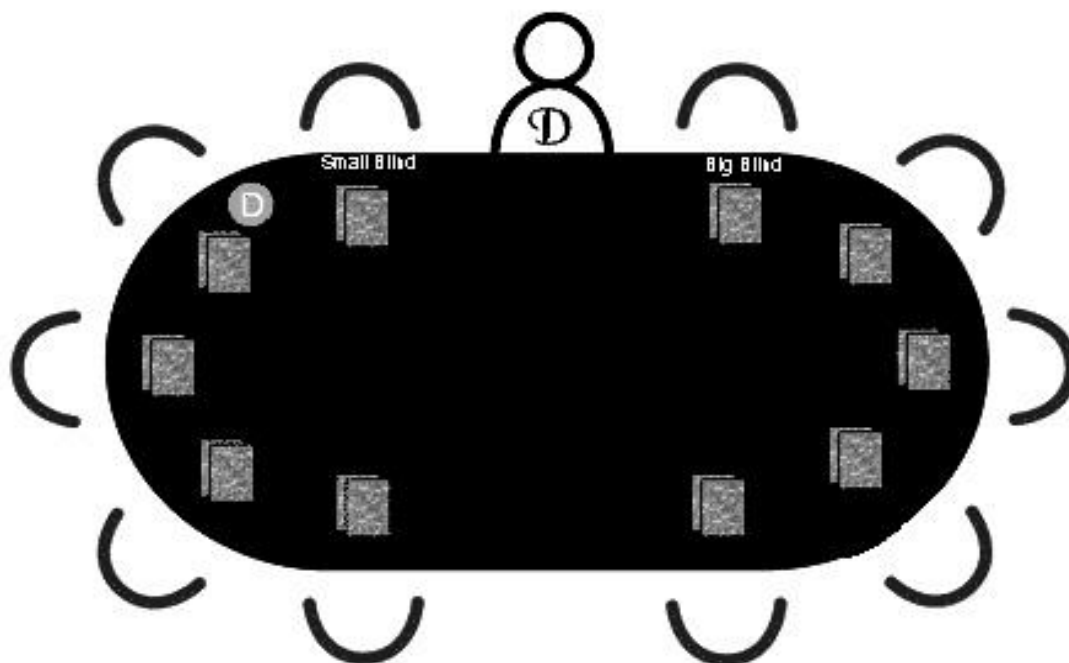
Appendix A: The Game of Texas Hold'Em

In Texas Hold'Em, all players are dealt two cards face down that are hidden from all other players. These cards are often called “hole cards”. Dealing occurs clockwise from the left of the “dealer button”. The dealer button is often a round marker that signifies where the dealer is. The dealer button changes and shifts clockwise after each hand is played. In some games player have a dealer who is not involved in the game that deals the cards to all players. In other games, players take turns dealing as the dealer button comes around to them. To the left of the dealer are the blinds; the small blind and then the big blind. Blinds are forced bets that a player “posts” before hands are dealt. The small blind is often roughly half the size of the big blind. For example, when playing a \$1/\$2 Hold'Em poker game, the small blind would be \$1 and the big blind would be \$2. See Figure 1 for what a typical table structure looks like. A betting round would then occur and the action is first on the person to the left of the big blind. This person can either call (which would amount to the same amount as the big blind), fold (which means they relinquish their cards) or raise (in “No Limit” Texas Hold'Em a person can raise as much as they wish, there is no limit to the amount of chips that they can raise and they can even put all of their chips in or go “All in”). The money that has accumulated from everyone’s calls or raises is called the pot. The action would then move on clockwise until all players have had a chance to act.

After everyone has acted, three community cards are dealt face up for all players to see. The community cards dealt are often called the “board”. The board is positioned in the middle of the poker table to allow all players to see. The first three community cards are called the “flop”. Action that happens before the flop is called “pre-flop” action. Action that happens after the flop is dealt is called “post-flop” action. After the flop is dealt another betting round occurs. The

player to act first is the one that has posted the small blind (directly left of the dealer). This person's options are to check (the person keeps his cards but does not put money in the pot), bet (the person places chips in the pot, in No- Limit Hold'Em this can be any amount the player wishes as there is no betting limit) or fold.










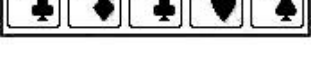
Figure 1: Structure of Texas Hold'Em Poker Game



Often people do not usually fold as they have the ability to just check and keep their cards in hopes of seeing another card before they fold. The next person can check, call the amount that the first person bet if they chose to bet, raise (the person raises over top of another's bet by putting in a higher amount of chips) or fold. The next person's options are to call, re-raise (the person can raise over top of the amount a person in front of them have raised) or fold. This again goes on until all players have acted. After all have acted a fourth card is dealt on the board face up. This is called the "turn". Another betting round occurs and then the fifth and final community

card is dealt. This last card is called the river. The last betting round occurs and those that stayed in the hand will then go to show-down. At show-down, the players that stayed in the hand will reveal their cards and the best hand will win the pot. Often the flop, turn and river are called “streets”. The flop is referred to as First Street, the turn is Second Street and the river is Third Street. Poker hands often do not go to show-down and many hands will be completed either on the flop or turn. This occurs because all other players have folded to a bettor or raiser.

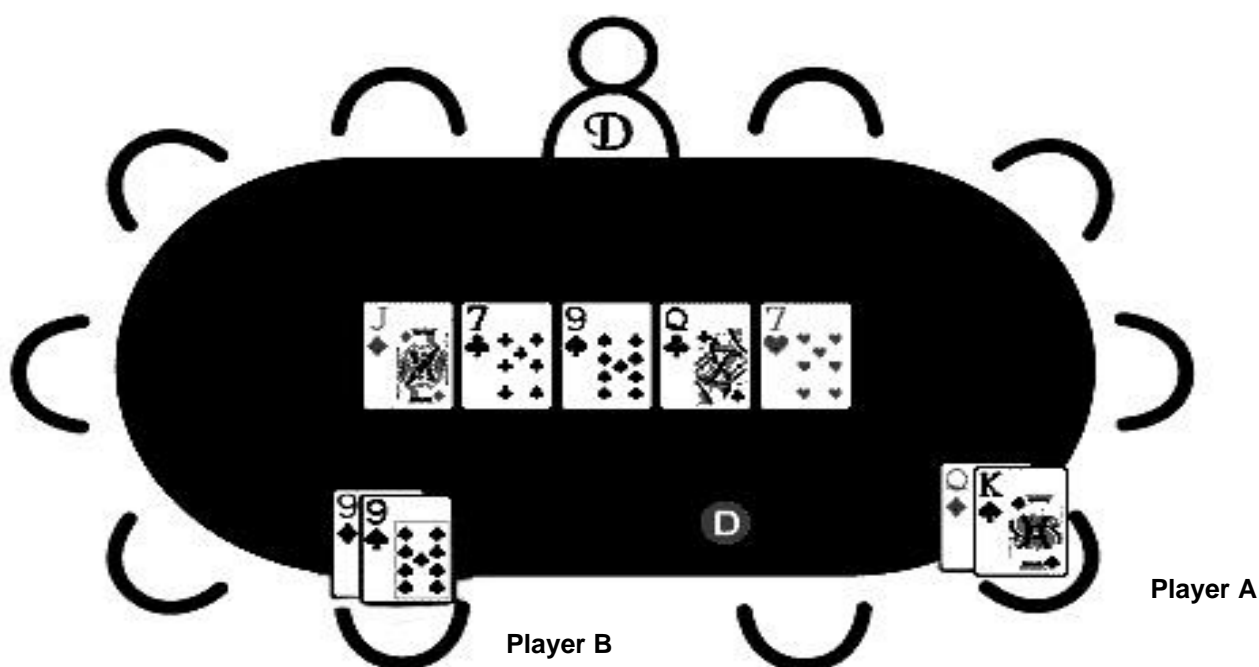
Figure 2: Poker Hands and their Rankings

	The Royal Flush: Five cards of the highest ranked from 10 to ace and of the same suit.
	The Straight Flush: Five cards forming ranked in sequence and of the same suit.
	Four of a kind: A hand with four cards of the same rank.
	Full House: A hand with three cards of one rank and two of another rank(essentially three of a kind + a pair).
	Flush: Five cards of the same suit.
	Straight: Five cards ranked in sequence.
	Three of a kind: Three cards of the same rank. This hand is also called "trips".
	Two Pairs: Two cards of one rank, two cards of another rank.
	Pair: Two cards of one rank.
	High Card: Also known as a "no pair" hand. This example is considered "Ace high" because of all the cards in this hand, the ace is worth the most.

The object of Texas Hold’Em poker is to make the best five card hand out of the two cards you are dealt and the community cards. See Figure 2 for a list of the different hands possible in Texas Hold’Em ranked according to strength. Figure 3 illustrates a showdown between two players. Player A has made two pair with the Queen in their hand and the Queen on

the board. There is also a pair of sevens on the board giving them two pair. When making a hand, a player takes the five best cards for their hand out of the possible seven at their disposal (5 community cards and 2 hole cards). So for Player A, he would use the Queen in his hand, the Queen on the board, the two sevens on the board and the King in his hand. These cards make the best possible 5 card combination for that player. He or she would use the king in their hand because it is a stronger card than the Jack or nine on the board. Often these “extra” cards are called “kickers”. A kicker for a person’s hand can often decide if they lose a hand against a person with a similar hand. For example, if another person also had a Queen in their hand and had also made two pair (Queens and sevens), it is often a player’s kicker that determines who wins. If one player has an Ace kicker in their hand and another had a King kicker, then the player with the Ace kicker wins the hand. According to Figure 3, Player B has made a full house, a very strong hand in poker. His best 5 card combination includes the two nines in his hand, the nine on board and the two sevens on board. A full house beats two pair so Player B will win the pot at the show-down.

Figure 3: A Showdown Example



Appendix B: Expected Value in Poker

Expected value has been applied to the game of poker and is a very important aspect of good decision-making in the game (Sklansky, 1999). Poker professionals and experts frequently allude to making decisions during game play that have a positive expectation and avoiding situations that have a negative expectation (Sklansky, 1999). A common rule of thumb when determining whether a certain play or action has a positive or negative expected value is to evaluate one's chances or odds of winning against the pot odds. Pot odds in poker are determined by comparing the amount of money that is in a pot (i.e. the amount you can win) against the amount that you need to put in the pot to continue playing a hand. For example, if there is a pot that is \$100 and your opponent bets \$25 you would need to put in \$25 to potentially win \$100. This makes the odds 4:1 (i.e. put \$25 in the pot to potentially get 4 x \$25 back). The larger this ratio is, the better the pot odds one is getting (i.e. 4:1 is better odds than 2:1). When one is getting 4:1 pot odds, one needs to win the hand one out of five times to break even.

Determining win odds in Texas Hold'Em poker is slightly more complicated as there is a degree of uncertainty when calculating them. For example, if you are in a hand situation against one opponent that is making a bet and you have a flush draw on the flop after the first three community cards are dealt (i.e. you hold two clubs in your hand and there is two clubs on the flop, you need one more club to make a flush), you must calculate the likelihood of making your flush on the next street. If you have calculated that you have nine potential club cards left in the deck that can help you make your flush, then the odds of hitting one of these club cards needs to be determined. The likelihood of any one card hitting is 2% (Sklansky, 1999) and if you have nine potential cards left in the deck that can help, you would multiply nine times 2% ($9 \times 2\% = 18\%$). If you have two streets to come (i.e. the turn and the river) to try to catch the card that you

need you would then multiply 18% by two, giving you a 36% chance of hitting your flush. If you only have one street left (i.e. the river) then you would leave it at 18%. The ratio against winning is 64:36 or roughly 1.8:1 against hitting your flush. In other words, you would hit your flush one out of approximately three times. When comparing this ratio to the pot odds of 4:1 in the previous example, one can see that if one will make the flush 1 out of roughly 3 times and one only needs to win 1 out of 5 times to break even, one is making a profitable play (i.e. this play has a positive expected value). In other words, your odds to win must be better than your odds of breaking even to make this a profitable decision. If your opponent bets the amount of the pot (\$100), then your pot odds would be 1:1 and you would need to win 1 out of two times to break even. This play has a negative expected value and one would lose money in the long run if one were to continuously make this call in this situation. There are many other factors that can affect expected value in poker such as the likelihood that your opponent(s) will fold (fold equity), the amount your opponent will call or bet on future streets and ultimately the amount you stand to win if you make your hand (implied pot odds) and narrowing the range of hands your opponent could be holding. Determining the value of these factors is often very complicated and only approximations can be made that require a great deal of experience and skill. For the purposes of the present discussion, expected value will not include these other factors.

Appendix C: Online Recruitment Text for Study 1

Online Poker Study - All players are welcome

Hi everyone, my name is Melinda Morgan. I'm a PhD student in psychology at the University of Ottawa in Ottawa, ON, Canada, under the supervision of Dr. Celine Blanchard. I'm doing an online study investigating Decision-Making in Poker Players for my dissertation. I'm an avid player myself and love this game.

All poker players are welcome at any skill or experience level. If you are interested in taking part, here is the link: <https://www.psychdata.com/s.asp?SID=133190> It takes about 20 minutes or so to complete the online survey. This study is completely anonymous.

Please feel free to share the link with any of your poker buddies!

Take care,

Melinda

Appendix D: Informed Consent for Study 1

Welcome to the Decision-Making in Poker Players study. Thank-you for visiting. If you are interested in taking part in this study, please read the informed consent below:

I am invited to participate in a study entitled “Decision-Making in Poker Players” that is currently being conducted by Céline Blanchard, Ph.D., and Melinda Morgan, M.A., both from the School of Psychology at the University of Ottawa in Ottawa, ON, Canada. The purpose of this study is to investigate the psychological processes involved in decision-making in games like poker. Studying the psychology of poker not only helps to unravel the complexities of this unique and challenging game filled with endless opportunities for strategy and mastery, it also has important implications for other life domains in which effective decision-making is needed (i.e. work, education, health).

My participation in this study will consist of completing an online questionnaire of approximately 20 minutes in duration. The risks and inconveniences associated with participating in this study are minimal. However, it is possible that I may experience some discomfort while completing some of the questionnaire questions. Some items in the questionnaires may be personal and reflecting on them may cause some psychological and/or emotional discomfort. However I have received assurance from the researcher that my participation in this study is entirely voluntary. I am free to withdraw from the survey at any time without incurring any negative consequences. Should I choose to withdraw, any data that I will have provided will be destroyed and thus will not be used for any analyses. Furthermore, I do not have to respond to any items in the online questionnaire that make me uncomfortable.

My anonymity in this project will be protected. I am not required to provide my name nor any personal contact information on the questionnaires. I have also been assured that the information that I provide will be kept strictly confidential. The data from this online questionnaire is encrypted for my protection and no information regarding my computer IP address will be obtained by PsychData.com. The data collected from this study will be saved on a CD disk and stored in a locked cabinet in the researchers’ laboratory for a period of 5 years. I have been informed that only the researcher and investigator will have access to the data whether it is the original questionnaires or the data file on the computer. I am aware that the results obtained from this project are for research purposes only and publication of the results will be limited to group responses rather than individual ones in scientific journals.

If I have any questions about the study, or if I would like to receive a report of the results when they become available, I may contact Céline Blanchard, Ph.D. or Melinda Morgan, M.A., at the coordinates below.

Céline Blanchard, Ph.D and Melinda Morgan, MA

If I have any ethical concerns regarding my participation in this study, I may contact the Protocol Officer for Ethics in Research

If you agree with these statements and consent to participate, please click on the “Continue” button below.

Appendix E: Debriefing Form for Study 1

Thank you very much!

We would like to thank-you for taking part in this study. Your participation is invaluable and is greatly appreciated! Please feel free to pass on the survey link to other poker players: <https://www.psychdata.com/s.asp?SID=133190>

NOTE: If you heard about this study on an online forum or message board, we will ask that you do not share specific information about the study on the boards or forums (i.e. the goal of the research, specific questions in the study), as this may affect how others answer the questions. Please feel free to share your general thoughts about the study (i.e. whether you enjoyed taking part or found it interesting, whether you recommend that others take part, etc.).

What are we trying to learn in this research?

What psychological processes help players make better decisions? What motivates poker players to play this game? This study is designed to answer these kinds of questions. Studying decision-making in poker players not only helps to unravel the complexities of this unique and challenging game filled with endless opportunities for strategy and mastery, it also has important implications for other life domains in which effective decision-making is needed (i.e. work, education, health).

The goal of this study is to investigate the role of mood in decision-making in poker players. There is a large body of literature investigating the relationship between mood and decision-making. Research has indicated that positive mood states are associated with enhanced problem-solving and decision making (Isen, 2001). In the context of gambling, positive mood states are associated with aversions to high-risk situations (Isen & Geva, 1987; Isen & Patrick, 1983) and negative mood states are associated with higher risk-taking in decisions, particularly when the payout is high (Leith & Baumeister, 1996).

In order to be generally successful in poker on a long-term basis one must continually make good, informed decisions that minimize losses and maximize wins. This creates a unique and appropriate climate for studying mood regulation and decision-making.

Was there deception involved in this study?

Yes, you were told that the text passage that you read was used to test your memory of the content. However, the true intent of the passage was to induce either a positive, negative or neutral mood experimentally. Prior to your study participation you were randomly assigned to either a positive, negative or neutral mood induction. The questions about the text passage were chosen to hide the true intent of the passage. The true intent of the study is to investigate the role of mood in decision-making. Poker presents a very unique environment to study this relationship.

Why is this important for scientists or the general public?

Theoretically, this study will be amongst the first studies to examine mood regulation and decision-making as it applies to decisions in games that allow for background knowledge and skill. Second, on a more applied basis, linking all three of these psychological concepts can contribute to a better understanding of relations in various life domains (i.e., work, gambling, education). This is the first of a set of studies that will be conducted. In other studies, players will be given the opportunity to play poker online in a lab setting.

What if I have questions later?

If you have any remaining concerns, questions, or comments about the experiment or would like to learn about the results of this study down the road, please feel free to email Melinda Morgan at or talk to Dr. Celine Blanchard

If you have any ethical concerns you can also discuss them with the Protocol Officer for Ethics in Research.

Appendix F: Recruitment Flyer for Study 2 and 3

Poker Study



Participate and be entered in a draw for a subscription to **Daniel Negreanu's online Poker Virtual Trainer !!!**

Do you play Texas Hold'Em poker regularly (**have played for at least 6 months and/or more than 10 times**)? If so, you are invited to be part of an exciting study looking at the psychology of poker! What psychological processes help players make better decisions? What motivates poker players to play this game? This study is designed to answer these kinds of questions.

Participation in this study consists of attending one laboratory session (Approx. 90 minutes). During this session you will be asked to fill out some questionnaires and play some poker!

If you are interested in participating, please contact Melinda Morgan.

Céline Blanchard, Ph.D and Melinda Morgan, M.A.



Appendix G: Recruitment Text for Course Credit for Study 2

Shuffle up and Deal! The Psychology of Poker and Decision-Making

You are invited to be part of an exciting study looking at the psychology of poker! What psychological processes help players make better decisions? What motivates poker players to play this game? This study is designed to answer these kinds of questions. Studying the psychology of poker not only helps to unravel the complexities of this unique and challenging game filled with endless opportunities for strategy and mastery, it also has important implications for other life domains in which effective decision-making is needed (i.e. work, education, health). Participation in this study consists of attending one laboratory session of approximately 90 minutes. During this laboratory session you will be asked to fill out questionnaires pertaining to various psychological processes thought to be important in the study of poker and you will play some poker!

Note: This study will be conducted in English only.

Appendix H: Informed Consent for Study 2 and 3

THE PSYCHOLOGY OF POKER

I am invited to participate in a laboratory experiment entitled “The Psychology of Poker” that is currently being conducted by Céline Blanchard, Ph.D., and Melinda Morgan, both from the School of Psychology at the University of Ottawa. The purpose of this study is to investigate the psychological processes involved in the game of poker.

My participation in this study will consist of attending this one laboratory session of approximately 115 minutes in duration. During this laboratory session I will be asked to fill out questionnaires related to my motivations to play poker, perspective-taking and other psychological processes that may be important in the study of the psychology of poker. I will then be asked to play 50 hands of poker on a lab computer. I will be alone in the lab while I fill out the questionnaires, watch the video clip and play poker. However, the experimenter will come back in the room to give me instructions for my next task and will be just outside of the testing room should I require any assistance or have any questions. *For those recruited from ISPR:* In agreement with the Integrated System of Participation in Research (ISPR), hosted by the School of Psychology, I will be granted two points for participating in this study placed in a draw to win a 6-month subscription to Daniel Negreanu’s Poker Virtual Trainer online poker training community forum for participating in this study. *For those recruited through campus flyers:* I will be placed in a draw to win a 6-month subscription to Daniel Negreanu’s Poker Virtual Trainer online poker training community forum for participating in this study.

The risks and inconveniences associated with participating in this study are minimal. However, it is possible that I may experience some discomfort while watching an emotional movie clip and/or completing some of the questionnaires. Some items in the questionnaires are rather personal and reflecting on them may cause some psychological and/or emotional discomfort. However I have received assurance from the researcher that my participation in this study is **entirely voluntary**. I am free to withdraw from the experiment at any time without incurring any negative consequences. Should I choose to withdraw, I will still be granted my 2 participation points from the ISPR/entry into the draw for Poker Virtual Trainer and the data that I will have provided will be destroyed and thus will not be used for any analyses. Furthermore, I do not have to watch any clip that I do not feel comfortable with and/or respond to any items in the questionnaire that make me uncomfortable, nor do I have to play poker for the full 50 hands if I am not able or willing to. In the event that I may experience emotional or psychological discomfort from participating in this study, I may contact the Center for Psychological Services.

My anonymity in this project will be protected. This consent form will be kept in a separate box from the questionnaires that I will be asked to complete during the experiment. The questionnaires will be identified by my unique number code that I use for participating in studies hosted by the ISPR/ that I will be given by the researchers. I am not required to provide my name nor any personal contact information on the questionnaires. I have also been assured that the information that I provide will be kept strictly confidential. The data collected from this study will be stored in a locked cabinet in the researchers’ laboratory for a period of 5 years. I have been informed that only the researcher and investigator will have access to the data whether it is the original questionnaires or the data file on the computer. I am aware that the results obtained from this project are for research purposes only and publication of the results will be limited to group responses rather than individual ones in scientific journals.

I, _____, agree to participate in the study entitled “The Psychology of Poker”, conducted by Céline Blanchard, Ph.D and Melinda Morgan. I understand that by accepting to participate I am in no way waiving my right to withdraw from the study.

If I have any questions about the study, or if I would like to receive a report of the results when they come available, I may contact Céline Blanchard, Ph.D. or Melinda Morgan at the coordinates below.

If I have any ethical concerns regarding my participation in this study, I may contact the Protocol Officer for Ethics in Research.

There are two copies of the consent form, one of which is mine to keep.

Participant's signature: _____

Date:

Céline Blanchard, Ph.D and Melinda Morgan

Researchers' signature _____

Appendix I: Debriefing for Study 2 and 3

Debriefing

Was there deception involved in this study? Yes, you were told that the movie task was to study your ability to take perspectives in terms of an individual's thoughts and feelings and were given a questionnaire that we told you was assessing this. However, the true intent of the movie clip was to induce either a positive or a negative mood experimentally. Prior to your study participation you were randomly assigned to either a positive or a negative mood induction. The questionnaire after the clip was meant to have you meditate on the emotional reaction of the character and wasn't to test you on your ability to take another's perspective. The true intent of the study is to investigate the role of motivation and mood in decision-making. Poker presents a very unique environment to study this relationship.

What are we trying to learn in this research?

The goal of this study is to investigate the roles of motivation and mood regulation in decision-making in the context of a gambling activity. According to Self-Determination Theory (SDT) all individuals have basic, universal needs that center around three themes: competence, autonomy and relatedness (Deci & Ryan, 2000). A self-determined individual is said to be engaging with their environment in activities and behaviours with complete volition (i.e. the behaviour is determined by the self). Chantal, Vallerand and Vallières (1995, 1996) further applied SDT to gambling. For instance, one is intrinsically motivated towards a gambling activity for internal reasons such as fun and enjoyment, learning and knowledge, and challenge and accomplishment. Extrinsic motivations (EM) toward gambling activities include reasons outside of the individual such as monetary gain and pressures to keep playing (i.e. guilt) and are not self-determined.

There is a large body of literature investigating the relationship between mood and decision-making. Research has indicated that positive mood states are associated with enhanced problem-solving and decision making (Isen, 2001). In the context of gambling, positive mood states are associated with aversions to high-risk situations (Isen & Geva, 1987; Isen & Patrick, 1983) and negative mood states are associated with higher risk-taking in decisions, particularly when the payout is high (Leith & Baumeister, 1996).

In order to be generally successful in poker on a long-term basis one must continually make good, informed decisions that minimizes losses and maximizes wins. This creates a unique and appropriate climate for studying motivation, mood regulation and decision-making.

Why is this important for scientists or the general public?

Theoretically, this study will be amongst the first studies to link self-determination, mood regulation, and decision-making. Second, on a more applied basis, linking all three of these psychological concepts can contribute to a better understanding of relations in various life domains (i.e., work, gambling, education).

What are our hypotheses and predictions?

It is expected that both intrinsic motivation to play poker and positive affect will be related to better decision making (i.e. less risk-taking in relation to low probability of winning, higher risk taking in relation to higher probability of winning), whereas both extrinsic motivation and

negative affect will be related to poorer decision making (i.e. more risk-taking in lower probability of winning scenarios).

Is there anything I can do if I found this experiment to be emotionally upsetting?

Yes. Please feel free to contact the University of Ottawa Center for Psychological Services or the Distress Centre of Ottawa and Region

What if I have questions later?

If you have any remaining concerns, questions, or comments about the experiment please feel free to email Melinda Morgan or talk to Dr. Celine Blanchard

If you have any ethical concerns you can also discuss them with the Protocol Officer for Ethics in Research.

Thank you very much for your participation!

Appendix J: Online Mood Induction Texts

Neutral Text

What do we know about the universe, and how do we know it? Where did the universe come from, and where is it going? Did the universe have a beginning, and if so, what happened before then? What is the nature of time? Will it ever come to an end? Can we go back in time? Recent breakthroughs in physics, made possible in part by fantastic new technologies, suggest answers to some of these longstanding questions. Someday these answers may seem as obvious to us as the earth orbiting the sun.

As long ago as 340 BC the Greek philosopher Aristotle, in his book *On the Heavens*, was able to put forward two good arguments for believing that the earth was a round sphere rather than a flat disk. First, he realized that eclipses of the moon were caused by the earth coming between the sun and the moon. The earth's shadow on the moon was always round, which would be true only if the earth was spherical. If the earth had been a flat disk, the shadow would have been elongated and elliptical. Second, the Greeks knew from their travels that the North Star appeared lower in the sky when viewed in the south than it did in more northerly regions. The Greeks even had a third argument that the earth must be round, for why else does one first see the sails of a ship coming over the horizon, and only later see the hull?

Aristotle thought the earth was stationary and that the sun, the moon, the planets, and the stars moved in circular orbits about the earth. He believed this because he felt, for mystical reasons, that the earth was the center of the universe, and that circular motion was the most perfect. This idea was elaborated by Ptolemy in the second century AD into a complete cosmological model. The earth stood at the center, surrounded by eight spheres that carried the moon, the sun, the stars, and the five planets known at the time, Mercury, Venus, Mars, Jupiter, and Saturn.

The planets themselves moved on smaller circles attached to their respective spheres in order to account for their rather complicated observed paths in the sky. The outermost sphere carried the so-called fixed stars, which always stay in the same positions relative to each other but which rotate together across the sky. What lay beyond the last sphere was never made very clear, but it certainly was not part of mankind's observable universe.

A simpler model, however, was proposed in 1514 by Nicholas Copernicus. His idea was that the sun was at the center and that the earth and the planets moved in circular orbits around the sun. Nearly a century passed before this idea was taken seriously. Then two astronomers – the German, Johannes Kepler, and the Italian, Galileo Galilei – started to publicly support the Copernican theory, despite the fact that the orbits it predicted did not quite match the ones observed. The death blow to the Aristotelian/Ptolemaic theory came in 1609. In that year, Galileo started observing the night sky with a telescope, which had just been invented. When he looked at the planet Jupiter, Galileo found that it was accompanied by several small satellites or moons that orbited around it. This implied that everything did not have to orbit directly around the earth, as Aristotle and Ptolemy had thought. At the same time, Johannes Kepler had modified Copernicus's theory, suggesting that the planets moved not in circles but in ellipses. The predictions now finally matched the observations.

Positive Text

A Philosophy professor stood before his class with some items in front of him. He picked up a large empty mayonnaise jar and proceeded to fill it with rocks, about 2" in diameter. He then asked the students if the jar was full? They agreed that it was. So the professor then picked up a box of pebbles and poured them into the jar as he shook it lightly. The pebbles of course, rolled into the open areas between the rocks. He then asked the students again if the jar was full. They agreed it was. The professor picked up a box of sand and poured it into the jar, the students laughed. Of course, the sand filled up everything else.

“Now,” said the professor, “I want you to recognise that this is your life. The rocks are the important things - your family, your partner, your health and your children - things that if everything else was lost and only they remained, your life would still be full. The pebbles are the other things that matter like your job, your house and your car. The sand is everything else. The small stuff.”

“If you put the sand into the jar first, there is no room for the pebbles or the rocks. The same goes for your life.”

“If you spend all your time and energy on the small stuff, you will never have room for the things that are important to you.”

“Pay attention to the things that are critical to your happiness.
Play with your children.
Take time to get medical checkups.
Take your partner out dancing.”

“There will always be time to go to work, clean the house and fix the car. Take care of the rocks first - the things that really matter. Set your priorities. The rest is just sand.”

But then...A student took the jar which the other students and the professor agreed was full, and proceeded to pour in a glass of beer. Of course the beer filled the remaining spaces within the jar making the jar truly full.

The moral of this tale is:

That no matter how full your life is, there is ALWAYS ROOM FOR BEER.

Negative Text

Eleven-year-old Jaheem Herrera woke up on April 16 acting strangely. He wasn't hungry and he didn't want to go to school.

But the outgoing fifth grader packed his bag and went to school at Dunaire Elementary School in DeKalb County, Georgia.

He came home much happier than when he left in the morning, smiling as he handed his mother, Masika Bermudez, a glowing report card full of A's and B's. She gave him a high-five and he went upstairs to his room as she prepared dinner.

A little later, when his younger sister called him to come down to eat, Jaheem didn't answer. So mother and daughter climbed the stairs to Jaheem's room and opened the door.

Jaheem was hanging by his belt in the closet.

"I always used to see these things on TV, dead people on the news," says Bermudez. "I saw somebody die and to see this dead person is your son, hanging there, a young boy. ... To hang yourself like that, you've got to really be tired of something."

Bermudez says bullies at school pushed Jaheem over the edge. He complained about being called gay, ugly and "the virgin" because he was from the Virgin Islands, she said.

"He used to say Mom they keep telling me this ... this gay word, this gay, gay, gay. I'm tired of hearing it, they're telling me the same thing over and over," she said, as she wiped away tears from her face.

Recent studies have found that the most common form of bullying for both genders is verbal bullying or name-calling. The second most frequent type was rumors or slander, followed by hitting, pushing or kicking.

While Bermudez says her son complained about the bullying, she had no idea how bad it had gotten.

"He told me, but he just got to the point where he didn't want me to get involved anymore because nothing was done," she said.

Bermudez said she complained to the school about bullying seven or eight times, but it wasn't enough to save him.

"It just got worse and worse and worse until Thursday," she said. "Just to walk up to that room and see your baby hanging there. My daughter saw this, my baby saw this, my kids are traumatized."

She said Jaheem was a shy boy just trying to get a good education and make friends.

"He was a nice little boy," Bermudez said through her tears. "He loved to dance. He loved to have fun. He loved to make friends. And all he made were enemies."

Bermudez said she thinks her son felt like nobody wanted to help him, that nobody stood up and stopped the bullies.

"Maybe he said 'You know what -- I'm tired of telling my mom, she's been trying so hard, but nobody wants to help me,' " says Bermudez.

After Jaheem's death, the school board expressed condolences, saying the school staff "works diligently to provide a safe and nurturing environment for all students."

Trying desperately to understand what went wrong, Bermudez asked her son's best friend to recount what happened on the day Jaheem killed himself.

"He said he was tired of complaining, tired of these guys messing with him," Bermudez said, recalling the conversation with Jaheem's best friend. "Tired of talking, I think to his teachers, counselors and nobody is doing anything -- and the best way out is death."

Despite recent strides towards preventing bullying in schools and increased awareness programs, a Gay, Lesbian and Straight Education Network study showed that 65 percent of teens are bullied each year and most believe adults can't help them. The American Justice Department reports that 1 out of every 4 kids will be abused by another youth.

Bermudez doesn't understand why the children at school couldn't learn to get along. Because of it, she'll never get to see her son grow up.

"My baby, that's my only boy, and I lost him now," says Bermudez. "He was my first child and ... to lose him 11 years after, he didn't live his life."

Appendix K: Screenshot of the Manual Calculator in Hold'Em Indicator

Hold'em Indicator - Automatic Poker Odds & Stats Calculator

HUD Views Stats Tools

Players: 6 of 9 Position:

5 Outs: 2J 3A

1.6:1 Win Odds Pot Odds

A♥ J♥ 8♠ 4♣
A Pair of Jacks, Ace high

Enter License
Get License

HighCard	1 Pair	2 Pair	3 of a Kind	Straight	Flush	Full House	4 of a Kind	Str. Flush
99:1	2.4:1	1.9:1	3.1:1	4.9:1	24:1	19:1	499:1	40.7:1

2 3 4 5 6
 7 8 9 10
 Folded Players: 0 1 2 3 4
 5 6 7 8
[Reset](#) [Close](#)

Appendix L: Screenshot of Full Tilt Online Poker Software Play money table

Play Chip 1025 - 1000/2000 - No Limit Hold'em - Logged In As UOPoker

GET CHIPS PLAY REAL MONEY LAYOUT OPTIONS LOBBY STATS

LAST HAND STAND UP

DUH_WHAT1 198,000

mjbeck 212,000

ar515025327 Sitting Out

db_07_07_2007 455,000

24Finlandais 206,000

cebu50 71,000

tropers 207,000

arse2773 74,000

UOPoker 69,000

7♠ 4♥ 5♥

Total Pot: 78,000

20,000 5K

38,000 25K 5K 1K

20,000 5K

FOLD TO ANY BET

SIT OUT NEXT HAND

AUTO-POST BLINDS

MIN 40000 MAX

Dealer: db_07_07_2007 has 15 seconds left to act

Dealer: tropers wins the pot (64,000)

Dealer: Hand #12989942367

Dealer: tropers has 15 seconds left to act

FOLD CALL 20,000 RAISE TO 40,000

Appendix M: Screenshot of Hold'Em Indicator Software during Play

Play Chip 1429 - 1000/2000 - No Limit Hold'em - Logged in AS UOPoker

GET CHIPS | PLAY REAL MONEY | LAYOUT | OPTIONS | LOBBY | STATS

LAST HAND | STAND UP

gilberteuse 196,000 | tiapan666 194,000 | Special Tee1 359,000

9♣ 9♠ 10♥ J♠ | Total Pot: 12,000 | 4,000

MASTERMINE 168,000 | UOPoker 78,000 | guinness1p 100,000

FOLD TO ANY BET | SIT OUT NEXT HAND | AUTO-POST BLINDS

MIN POT MAX | 8000

FOLD | CALL 4,000 | RAISE TO 8,000

Dealer: gilberteuse has 15 seconds left to act
 Dealer: UOPoker has 15 seconds left to act
 gilberteuse: bonne st jean
 Dealer: gilberteuse has 15 seconds left to act

Hand	Odds
HighCard	15.7:1
1 Pair	1.6:1
2 Pair	8.1:1
3ofaKind	2.8:1
Straight	32.3:1
Flush	5.7:1
FullHouse	99:1
4ofaKind	0.10:1
Str.Flush	10.6:1

Players: 4 of 7 | Position: Middle | 4 Outs: 2(9) 2(6)

7.3:1 Win Odds | 3.0:1 Pot Odds

6♥ 6♦ | 9♣ 9♠ 10♥ J♠ | Two Pairs, Nines and Sixes, Jack high

Enter License | Get License

YOUR HAND ON RIVER (%) | OPPONENTS HAND ON RIVER (%)

Appendix N: Hand History Example of a Typical Hand

Full Tilt Poker Game #18572064411: Table Camino - \$1000/\$2000 - No Limit Hold'em -

16:08:35 ET - 2010/02/18

Seat 1: j_paukan (\$262,000)

Seat 2: leplumeurdu60 (\$183,000)

Seat 3: UOPoker (\$80,000)

Seat 4: storm_norm (\$318,650)

Seat 5: jjanka99 (\$182,000)

Seat 6: PoHe (\$76,000), is sitting out

Seat 7: Jacobwelz (\$196,000)

Seat 8: tjoiner33 (\$110,000)

Seat 9: bisonburger (\$305,000)

Jacobwelz posts the small blind of \$1,000

tjoiner33 posts the big blind of \$2,000

5 seconds left to act

UOPoker posts \$2,000

The button is in seat #5

*** HOLE CARDS ***

Dealt to UOPoker [8s 4d]

bisonburger calls \$2,000

j_paukan folds

leplumeurdu60 calls \$2,000

UOPoker checks

storm_norm calls \$2,000

jjanka99 folds

Jacobwelz folds

tjoiner33 checks

*** FLOP *** [7c 5h Td]

tjoiner33 checks

bisonburger checks

leplumeurdu60 bets \$6,000

UOPoker has 15 seconds left to act

UOPoker calls \$6,000

storm_norm folds

tjoiner33 folds

bisonburger folds

*** TURN *** [7c 5h Td] [6h]

leplumeurdu60 bets \$10,000

UOPoker calls \$10,000

*** RIVER *** [7c 5h Td 6h] [Qc]

leplumeurdu60 checks

UOPoker bets \$2,000

leplumeurdu60 calls \$2,000

*** SHOW DOWN ***

UOPoker shows [8s 4d] a straight, Eight high

leplumeurdu60 mucks

UOPoker wins the pot (\$47,000) with a straight, Eight high

*** SUMMARY ***

Total pot \$47,000 | Rake \$0

Board: [7c 5h Td 6h Qc]

Seat 1: j_paukan didn't bet (folded)

Seat 2: leplumeurdu60 mucked [5s 8h] - a pair of Fives

Seat 3: UOPoker showed [8s 4d] and won (\$47,000) with a straight, Eight high

Seat 4: storm_norm folded on the Flop

Seat 5: jjanka99 (button) didn't bet (folded)

Seat 6: PoHe is sitting out

Seat 7: Jacobwelz (small blind) folded before the Flop

Seat 8: tjoiner33 (big blind) folded on the Flop

Seat 9: bisonburger folded on the Flop

Appendix O: Screenshot of Poker Tracker

PokerTracker™ v3.00 build 3 Database: 2-65

File Database Tournaments Configure Help

Import Texas Holdem TableTracker

Cash Games Tournaments

Find: Find Mine Last Hide Player: **UOPoker** Site: **Full Tilt** Settings Filters Clear Refresh

General Hands **Sessions** Positions vs Player Winnings Reports Graphs Summary

Display: Sessions - By Time

Sessions by Time

Start Time	End Time	Table Sessions	MT Ratio	Minutes	Hours	Hands	Hands/hr	Amount Won	BB/100	BB/Hour	\$/Hour	Rake
2010/09/28 11:49	2010/09/28 12:42	2	0.98	54	0.90	50	55.56	-\$82,000.00	-41.00	-22.78	-\$91,111.11	\$0.00
1 Session(s)		2	0.98	54	0.90	50	55.56	-\$82,000.00	-41.00	-22.78	-\$91,111.11	\$0.00

Sessions Hands

Date	SB	BB	DB	PF Bet	Chips	Amount Won	Hole	Hole	SF	Flop	Flop	Flop	Turn	River	Final Hand	Winning
2010/09/28 11:49	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	\$2,000.00	\$80,000.00	-\$2,000.00	Js	Ks	<input type="checkbox"/>	9h	Jc	Td			(folded preflop)	(did not show ha
2010/09/28 11:50	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$4,000.00	\$78,000.00	\$66,000.00	Jd	Js	<input checked="" type="checkbox"/>	5h	9s	3d	4s	Tc	One Pair, Jacks	One Pair, Jacks
2010/09/28 11:51	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0.00	\$144,000.00	\$0.00	5c	2s	<input type="checkbox"/>	Kd	6s	7c			(folded preflop)	(did not show ha
2010/09/28 11:53	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0.00	\$144,000.00	\$0.00	6h	Ts	<input type="checkbox"/>	6s	3s	3d	Kh	Qc	(folded preflop)	Two Pair, Kings a
2010/09/28 11:54	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	\$2,000.00	\$144,000.00	-\$2,000.00	6s	Ts	<input type="checkbox"/>	Kd	Jd	4d	Js	3s	(folded preflop)	Full House, Jacks
2010/09/28 11:55	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$11,000.00	\$142,000.00	-\$23,000.00	Ks	Jd	<input checked="" type="checkbox"/>	5d	8s	Kc			(folded flop)	(did not show ha
2010/09/28 11:56	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$2,000.00	\$119,000.00	-\$2,000.00	7c	As	<input checked="" type="checkbox"/>	Qd	Kc	2c	8c	Ac	(folded flop)	Straight, Ace Hig

Sessions Results Graph

24 Players

Appendix P: Summary and Detailed List of Coding Steps

Summary and steps of Coding activities

- 1) Determine number of hands dealt until sit out by searching “uopoker is sitting out”. If can’t find it, estimate the hand by going 20 minutes ahead. Fill it in on your coding sheet.
- 2) Fill in participant number and scratch out the hands that were not dealt to participant on the coding sheet
- 3) Determine Preflop EV of all hands dealt
- 4) Highlight or circle positive EV preflop hands on coding sheet
- 5) Begin coding all hands
- 6) Do your counts
- 7) Fill in counts in SPSS under appropriate variables

Detailed Steps for coding:

- 1) Open Poker Tracker and open the appropriate database for your participant you are coding at that time. Open up the EV excel sheet, Hold’Em Indicator and the Hand History Folder for that participant.
- 2) Write your participant number on the top left corner of the coding sheet where it says “Participant # _____”
- 3) Determine the hand number that they sat out using the Edit→Find function in the text file and look for “uopoker is sitting out”. If you can’t find it then estimate it by choosing a hand that it roughly 20 minutes after they started playing. Find that hand number in the Sessions tab for your participant. Count down and determine what the hand number is. Write the hand number on your coding sheet in the top right corner where it says “Hands dealt until sitting out _____”
- 4) Circle or highlight the hand on the sheet to let yourself know that this is the last hand they played before sitting out.
- 5) Look in the SPSS file under the variable TotalHandsDealt and find out how many hands were dealt for that participant. Scratch out any unneeded hands on the coding sheet to let yourself know that you only need to code that amount of hands for that participant.
- 6) Determine the EV of hands: Open up your EV excel file and have the Sessions tab open in Poker Tracker. Look up in the EV any hands where you are unsure (most will be negative EV). Code each starting hand as 0 for negative (the EV number in the EV file is negative and red), 1 for positive (the EV number in the EV file is positive and green) and 2 for neutral (the EV number in the EV file is 0). For every hand you need to write it in the handpreev variables in SPSS.

Remember: The less players there are at the table, the more valuable hands become. So hands that were negative EV at a full 9-person table can become positive EV with less players. So just be aware of that and when in doubt check it out 😊

- 7) After you have coded all of the pre-flop starting hands for that participant in the SPSS file, scroll your cursor back to handpreev1 in the file. Then scroll right with the arrows. Every time you see a 1, go to the coding sheet and circle or highlight POS (for positive EV). For example if handpreev1 – 11 are all 0's and then handpreev12 is a 1, highlight or circle POS for Hand 12 on the coding sheet.
- 8) Next you can begin post-flop coding. Code all of the hands as shown in the tutorial and in the correction sheet I've just provided you. This is what I normally do for each hand:

1 – I have my Sessions tab open in Poker Tracker. I look under the Final Hand column for the hand and find out what happened to first give me an idea of what happened in the hand. If it says they folded preflop, then I know I don't have to code any post-flop play. If it says (folded flop), (folded turn), (folded river), (did not show hand) or shows a final hand i.e. One Pair, Sixes, then I know that I need to open my replayer for that hand and watch the hand. If it says (did not show hand) then I know either they raised preflop and no one called and they won the hand or they won the hand post-flop and it didn't go to show-down. The (did not show hand) help us know when to code the handplay variables as a 2. I also look over at the SB, BB and DB (Dead blind) in the Sessions tab and see if they were Big Blind.

2 – Once I've determined whether they've put money in the pot voluntarily or not, the next thing I do is circle the hand number on the coding sheet.

Here are the **reasons to circle** a hand number in the coding sheet:

- 1) They saw the flop (coded as 1 in handplay in SPSS)
- 2) They raised pre-flop and everyone folded and they won the pot without seeing a flop (coded as 2 in handplay in SPSS)
- 3) They pushed or called all of their chips all in (coded as 3 in handplay in SPSS)
- 4) They limped in or called a raise pre-flop but did not see a flop because they folded after (coded as 4 in handplay in SPSS)

Here's when you **don't** circle the hand number:

- 1) They folded pre-flop and did not put any chips in voluntarily at all. The Amount Won tab in Session in Poker Tracker will say 0.00 and the SF (saw flop) tab will not be checked.
- 2) They were a Small Blind and did not put in the 1000 in to see a flop. The Amount Won tab in Session in Poker Tracker will say -1000.00 and the SF (saw flop) tab will not be checked.
- 3) They were a Big Blind and they folded to a raise pre-flop and did not see the flop. The Amount Won tab in Sessions in Poker Tracker will say -2000.00 and the SF (saw flop) tab will not be checked.

3) I proceed to do the post-flop coding for that hand if needed. I pay attention whether I need to circle NV (not voluntary), BB (bad beat) and/or AA (All-in) for each hand.

Remember NV: You need to be aware of which hands are not voluntary (they are the Big Blind). You would circle NV on your coding sheet for any hands where they are the Big Blind and they got to just check and see a flop. You would not circle NV when they are the Big Blind and they called a raise or raise themselves and put in more than their Big Blind of 2000 to see the flop.

Remember BB: Remember to be aware of any situation where they were at least a 60% favourite (.66:1 or lower) on the flop and they ultimately lost the hand, even if they pushed all-in or called and all-in. You still determine what the odds were on the flop even in an all-in situation.

Remember AA: Remember to circle AA for that hand when they have either pushed all of their chips all-in or when they call a raise that puts them all-in (coded as 3 in handplay).

Remember adjusting stats for number of players in hand: Remember to adjust the manual stats calculator to the number of people currently in that point in the hand. The number of players change from decision to decision and this drastically affects the EV. So remember to change the number of players when they change!

If you have any situations that you are unsure of just leave it blank and write down the participant number and variable name i.e. participant 49, turn2ev5. You can then email these ones and I can take a look at it and advise you what to do.

9) Next you do your counts: The only variables you enter in the SPSS dataset are the one's listed on your coding sheet. Here is instructions for each:

Hands played first 20 (including blinds), called handsplayedfirst20 in SPSS: On your coding sheet, count all hands with the circled numbers up to and including the last hand played before sitting out and write it down on your coding sheet.

Hands played last 30 (including blinds), called handsplayedfirst20 in SPSS: On your coding sheet, count all hands with circled numbers after the hand that they sat out and write it down on your coding sheet.

Num Hands won, called NumHandsWon in SPSS: Just look under the General tab in Poker Tracker and it will tell you the number of hands won. Write it on coding sheet.

Num hands won money first 20, called `handswonmoneyfirst20` in SPSS: Open the Sessions tab and find the hand last hand they played before sitting out. Count all hands where they won money (number in green) up to this hand and write this down on your coding sheet.

Num hands lost money first 20 (not including blinds), called `handslostfirst20` in SPSS: Open the Sessions tab and find the hand that they played before sitting out. Count all of the hands where they lost more than 2000 (will be in red) up to and including the hand where they sat out. Write this number on your coding sheet.

Num hands lost money last 30 (not including blinds), called `handslostlast30` in SPSS: Open the Sessions tab and find the hand that they played before sitting out. Count all of the hands where they lost more than 2000 (number will be red) after the hand where they sat out. Write this number on your coding sheet.

Num Hands with POS EV played voluntarily, called `Posevplayedvoluntary` in SPSS: Look on your coding sheet and count all of the hands where the number **IS** circled, the POS **IS** circled or highlighted, and the NV is **NOT** circled. AA and BB can be either circled or not, they do not matter for this count. Write this number down on your coding sheet.

Num Hands with NEG EV played voluntarily, called `NegEVplayedvoluntary` in SPSS: Look on your coding sheet and count all of the hands where the number **IS** circled, the POS is **NOT** circled or highlighted, and the NV is **NOT** circled. AA and BB can be either circled or not, they do not matter for this count. Write this number down on your coding sheet.

All-ins with POS EV, called `PreflopAllinPosEV` in SPSS: Look on your coding sheet and count all of the hands where AA **IS** circled and POS **IS** circled or highlighted. Write this number down on your coding sheet.

All-ins with POS EV, called `PreflopAllinPosEV` in SPSS: Look on your coding sheet and count all of the hands where AA **IS** circled and POS is **NOT** circled or highlighted. Write this number down on your coding sheet.

Number of Bad Beats First 20, called `BadBeatsFirst20` in SPSS: Look on your coding sheet and count all of the hands where BB **IS** circled up to and including the last hand they played before sitting out. Write this number down on your coding sheet.

Number of Bad Beats Last 30, called `BadBeatsLast30` in SPSS: Look on your coding sheet and count all of the hands where BB **IS** circled after the last hand they played before sitting out. Write this number down on your coding sheet.

10) After you have done all of your counts, enter these numbers in the appropriate places in SPSS. They are in the same in order in SPSS as they are on the sheet to make it easier for us. I've shuffled the variables around to make it easier. The only variables you need to enter starting at **handsdealtuntilsitout** to **BadBeatsLast30**. Everything else you can just ignore, you don't have to worry about it!

Appendix Q: Coding Sheet Example

First Side of Sheet

Participant # 58 14:23 Hands dealt until sitting out 15

NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA
1	2	3	4	5	6	7	8	9	10	5
NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA
11	12	13	14	15	16	17	18	19	20	6
NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA
21	22	23	24	25	26	27	28	29	30	3
NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA
31	32	33	34	35	36	37	38	39	40	3
NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA
41	42	43	44	45	46	47	48	49	50	
NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA
51	52	53	54	55	56	57	58	59	60	
NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA
61	62	63	64	65	66	67	68	69	70	
NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA	NV POS N BB AA
71	72	73	74	75	76	77	78	79		

Second Side of Sheet

Participant # _____

Hands dealt until sitting out _____

Hands played first 20 (including blinds) 13Hands played last 30 (including blinds) 16Num Hands won 10Num hands won money first 20 3Num hands lost money first 20 (not including blinds) 6Num hands lost money last 30 (not including blinds) 6Num Hands with POS EV played voluntarily 5Num Hands with NEG EV played voluntarily 17Num Hands with NEUT EV played voluntarily 3All-ins with POS EV 0All-ins with NEG EV 0Number of Bad Beats First 20 1Number of Bad Beats Last 30 1

NV = Not voluntary (was a big blind and did not voluntarily put money in pot when saw flop).

POS = Positive EV pre-flop

BB = Bad beat (was a 60:40 favorite on flop).

AA = Pushed or called all-in pre flop

Appendix R: The History of Poker

The history of Poker is thought to have evolved over more than ten centuries from various games, all involving the basic principals of ranked card or domino combinations and the use of 'bluffing' to deceive opponents. One popular belief is that a game similar to poker was first invented by the Chinese sometime before 969 A.D, when The Emperor Mu-tsung is reported to have played "domino cards" with his wife on New Years Eve.

Egyptians in the 12th & 13th centuries are known to have used a form of playing cards, and in 16th century Persia "Ganjifa" or "Treasure Cards" were used for a variety of betting games. A Ganjifa deck consisted of 96 elaborate cards, often made of paper thin slices of ivory or precious wood. The Persians played "As Nas" which utilized 25 cards, rounds of betting and hierarchical hand rankings.

A French game named "Poque" and a German game named "Pochen" became very popular in the 17 & 18th centuries, both developed from the 16th century Spanish game called "Primero" which involved three cards being dealt to each player. Bluffing, or betting high stakes whilst holding poor cards to deceive opponents, was an integral part of the game. Primero dates back to 1526 and is often referred to as "poker's mother" as it is the first confirmed version of a game directly related to modern day poker.

French colonials imported the game to the new world when they arrived in Canada. Their beloved poque was the national card game of France and from the beginning of the 18th century, when a hardy group of French-Canadian settlers founded New Orleans, it spread from the state of Louisiana up the Mississippi river and then throughout the whole country.

In 1834, Jonathan H. Green made one of the earliest written references to poker when in his writing he mentions rules to the "cheating game," being played on Mississippi riverboats.

“The Cheating Game” quickly began to supplant the popular cardsharp game of 3-card Monte on the gambling circuit. Gamers embraced the new game as it was perceived as a more challenging and 'honest' gamble than the notoriously rigged 3-card game. Green took more than a passing interest in the new game and took it upon himself to formally name and document the 'Cheating Game' in his book 'An Exposure of the Arts and Miseries of Gambling': Poker was born. During the Wild West period of United States history, a saloon with a Poker table could be found in just about every town from coast to coast. It was extremely popular during the Civil War when the soldiers of both armies played. European influence of poker ended when the joker was introduced as a wild card in 1875.

In just over two centuries, poker has never looked back. Since its humble beginning on the banks of the Mississippi, the popularity of this widely played game has grown in leaps and bounds to evolve numerous variations and sub-variations.

There have been three games that have, in turn, dominated the modern poker scene:

- 5 Card Draw rose from relative obscurity during the American Civil War to the most popular game for almost a century. Nevada made it a felony to run a betting game. However the Attorney General of California declared that draw poker was based upon skill and therefore the anti-gambling laws could not stop it. But stud poker was still deemed illegal as it was based solely on chance. With this decision, draw poker games developed and grew. This caused Nevada to reverse itself in 1931 and legalize casino gambling.
- 7 Card Stud then took over the throne shortly before WWII and maintained its position for about 40 years with the help of the new and thriving Las Vegas casino industry.
- Texas Hold'em, christened the 'cadillac of poker' rose to prominence in the 1970's when it was featured as the title game in the World Series of Poker. Today, Texas Hold'em is

indisputably the most frequently played and most popular poker game in the world, played in casinos and on home game tables the world over.

Other variations such as Omaha, Stud Poker, Manila, Draw Poker and Razz are also popular, but nothing can compete with the thrill of No Limit Texas Hold'em.

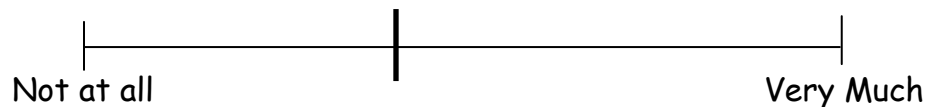
Appendix S: Questionnaires and Other Measures

Study 2 and 3 - Mood Measure 1, 3 and 4

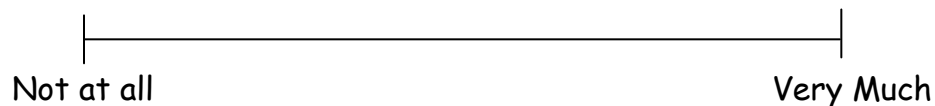
Please indicate how you are feeling **right now**...

Below the example, please draw a vertical line on the horizontal line to indicate your feelings ***right at this present moment***.

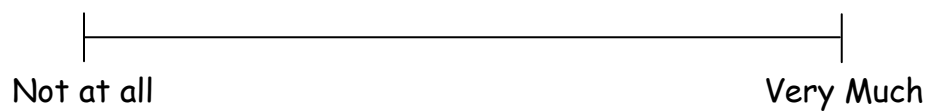
Example: I feel *excited*.



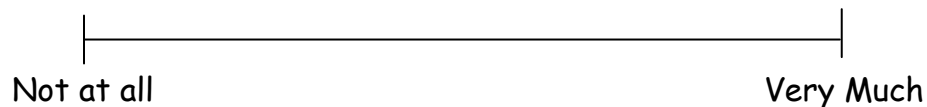
1. I feel *happy*.



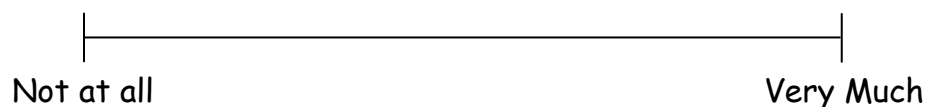
2. I feel *bored*.



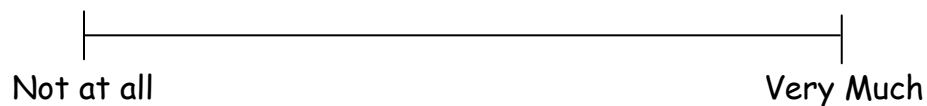
3. I feel *sad*.



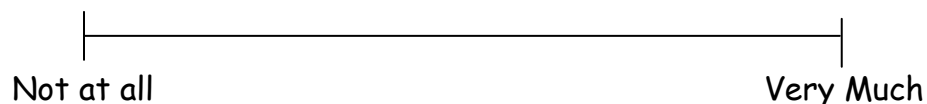
4. I feel *frustrated*.



5. I feel *tired*.



6. I feel *calm*.



Study 2 and 3 – Mood Measure 2 (Post-Induction)

Film Clip

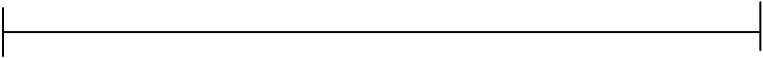
Have you seen this movie before?

Yes

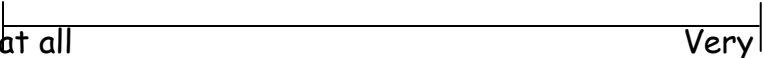
No

Please indicate how you are feeling **right now in this present moment...**

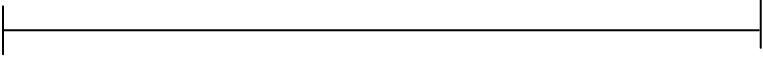
1. I feel *happy*.

Not at all  Very Much

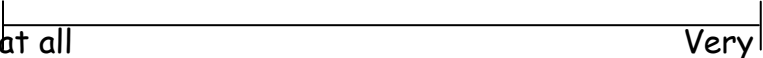
2. I feel *bored*.

Not at all  Very Much

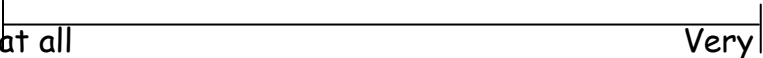
3. I feel *sad*.

Not at all  Very Much

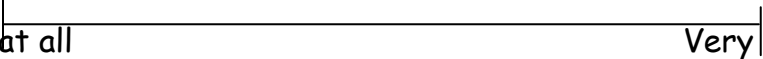
4. I feel *frustrated*.

Not at all  Very Much

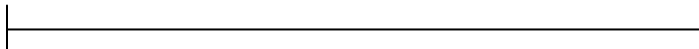
5. I feel *tired*.

Not at all  Very Much

6. I feel *calm*.

Not at all  Very Much

1) How would you rate the audio quality of this clip? (please mark a vertical line)



Poor

Excellent

2) How would you rate the picture quality of this clip? (please mark a vertical line)

Poor |-----| Excellent

3) Did you find the clip easy to follow/understand? (please mark a vertical line)

Not at all |-----| Very easy
easy

4) What did you like about this clip? (please write on space provided)

5) What did you dislike about this clip? (please write on space provided)

Study 1 Questionnaire

Decision-Making in Poker Players

The first part of the survey asks you some demographic questions...

1. What is your age?

2. What is your gender?

Male Female

3. What is your current marital status?

Single Married Common-law In a relationship Widowed Divorced

4. Please choose the race/ethnicity that best applies to you:

- Arab/West Asian (e.g. Armenian, Egyptian, Iranian, Lebanese)
- Black (e.g. African, Haitian, Jamaican, Somali)
- Chinese
- Filipino
- Japanese
- Korean
- Latin American (e.g. Spanish, Portuguese, Mexican,)
- Native, First Nations, Inuit, or Metis
- Mixed
- Native, First Nations, Inuit, or Metis
- South Asian (e.g. East Indian, Pakistani, Sri Lankan)
- South East Asian (e.g. Cambodian, Indonesian, Vietnamese)
- White (Caucasian)
- Other (please specify)

Other:

5. What is your current employment status?

Full-time Part-time On-leave Unemployed Student Other (please specify)

Other:

6. What is the highest level of education you have completed?

- Less than High School
- High School/GED
- Vocational or Technical School
- Some College/University
- College or University degree (BA, BS)
- Master's Degree (MA, MS)
- Doctoral Degree (PhD)
- Professional Degree (eg. MD, JD)

- | | | | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 9. To show others that I am a dynamic person. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 10. For the pleasure I get at improving my knowledge of the game. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 11. To buy something that I dream of. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 12. Because it allows me to enjoy myself enormously. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 13. Because it is the best way I know of to eliminate tension. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 14. For the strong sensations I feel when I play. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 15. For the satisfaction of learning new ways of playing. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Page Break

CONTINUED FROM LAST PAGE...

WHY DO YOU PLAY?

- | | Don't agree
at all | | | Moderately
agree | | | Very strongly
agree |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|
| 16. To be envied by others. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 17. Because it is the hobby I have chosen to clear my mind. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 18. For the pleasure of knowing my abilities at this game. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 19. For the satisfaction I feel when I can control the game. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 20. For the curiosity of knowing what can happen in the game. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 21. I play, but sometimes I feel I am not getting a lot out of it. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 22. To make money quickly and easily. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 23. Because it's the best way I know of to meet friends. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 24. For the feeling of control it gives me. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 25. I play, but I sometimes ask myself if it is good for me. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 26. Because when I win, I feel like someone important. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 27. To make a lot of money. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 28. For the thrill or the strong sensations it gives me. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Page Break

The next set of questions pertains to how you are feeling...

Page Break

5. I feel tired.

Not At All

Very Much

.

6. I feel calm.

Not At All

Very Much

.

Page Break

Next we will ask you to read a short text passage. Please make sure that you have a quiet environment to read. We will be asking you some questions about this text passage a little later to test your memory of this passage...

Page Break

<<<INSERT TEXT PASSAGE>>>

Page Break

We would like to again ask you how you are currently feeling in this present moment...

1. I feel happy.

Not at All

Very Much

.

2. I feel bored.

Not at All

Very Much

.

3. I feel sad.

Not at All

Very Much

.

4. I feel frustrated.

Not at All

Very Much

.

5. I feel tired.

Not at All

Very Much

6. I feel calm.

Not at All

Very Much

Page Break

The next set of questions pertain to choice problems in a variety of different contexts. Since people think differently in different contexts, there are no right or wrong answers – just individual preferences. For each question, indicate what your first thought is about which option you favor. Indicate your choice by choosing a number on the 7-point scale that represents the degree to which you are likely to choose the option.

Page Break

1. In a roll of a single die, which option would you choose?

OPTION A: A \$30 payoff if the die lands on 6

OPTION B: A \$5 payoff if the die lands on 1 through 5

Definitely Choose

OPTION A

Definitely Choose

OPTION B

1 2 3 4 5 6 7

Page Break

2. In a game of chance, which option would you choose?

OPTION A: \$500 for sure

OPTION B: A 50% chance of winning \$1000

Definitely Choose

OPTION A

Definitely Choose

OPTION B

1 2 3 4 5 6 7

Page Break

3. In a game of chance, which option would you choose?

OPTION A: A 25% chance of losing \$6,000

OPTION B: A 25% of losing \$4,000 and a 25% chance of losing \$2,000

Definitely Choose
OPTION A

Definitely Choose
OPTION B

1 2 3 4 5 6 7

Page Break

4. In a game of chance, which option would you choose?

OPTION A: A 50% chance to win a three-week tour of England, France, and Italy

OPTION B: A one-week tour of England, with certainty

Definitely Choose
OPTION A

Definitely Choose
OPTION B

1 2 3 4 5 6 7

Page Break

5. In a game of chance, which option would you choose?

OPTION A: A sure win of \$30

OPTION B: A 80% chance to win \$45

Definitely Choose
OPTION A

Definitely Choose
OPTION B

1 2 3 4 5 6 7

Page Break

6. In a roll of a single die, which option would you choose?

OPTION A: A \$100 payoff if the die lands on 6

OPTION B: A \$20 payoff if the die lands on 1 through 5

Definitely Choose
OPTION A

Definitely Choose
OPTION B

1 2 3 4 5 6 7

Page Break

7. You are given \$1000. Which option would you choose?

OPTION A: Losing \$500 for sure

OPTION B: 50% chance of losing \$1000

Definitely Choose
OPTION A

Definitely Choose
OPTION B

1 2 3 4 5 6 7

Page Break

8. In a game of chance, which option would you choose?

OPTION A: An 80% chance of winning \$4,000

OPTION B: \$3,000 for sure

Definitely Choose
OPTION A

Definitely Choose
OPTION B

1 2 3 4 5 6 7

Page Break

9. Imagine that the U.S. is preparing for the outbreak of an unusual disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows. Which of the two programs would you favor?

OPTION A: If program A is adopted, 400 people will die.

OPTION B: If program B is adopted, there is a 1/3 probability that nobody will die, and a 2/3 probability that 600 people will die.

Definitely Choose
OPTION A

Definitely Choose
OPTION B

1 2 3 4 5 6 7

Page Break

10. Imagine that you work for a company that is merging with another company next month. The companies have announced two plans for dealing with employees and your union wants you to vote on the plans. Which would you vote for?

OPTION A: Keep salaries at same level as present and cut 70% of the workforce.

OPTION B: Lower salaries for everyone and cut 20% of the workforce.

Definitely Choose
OPTION A

Definitely Choose
OPTION B

1 2 3 4 5 6 7

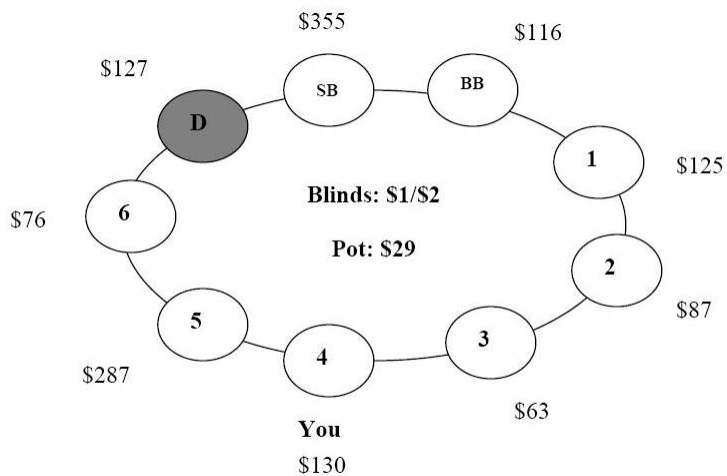
Page Break

The next set of questions present scenarios that a person can find themselves in when playing No Limit Texas Hold'Em poker. You will be presented with a picture representation of a poker table with stack sizes and table positions labeled in the pictures. Your position at the table will be labeled "You". The Dealer Button will be labeled with a "D". The Small Blind is labeled "SB" and the Big Blind is "BB". You will be asked what you would do in each situation and will be presented with 4 options for each question.

Based on the information given, what would you do in each scenario?

Page Break

Scenario 1

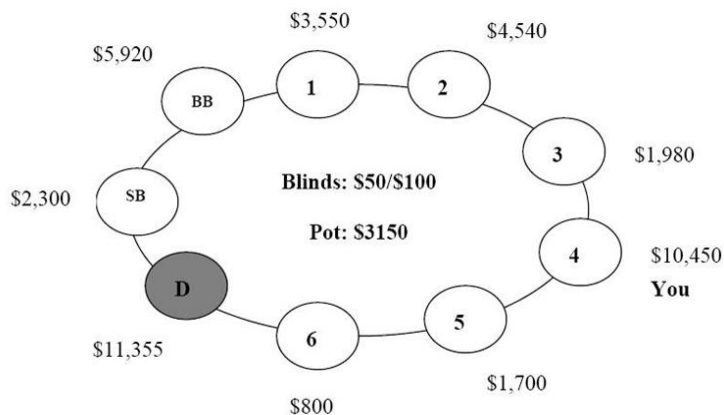


You are playing in a cash game. It is before the flop and Player 1 has folded. Player 2 raised to \$6 and Player 3 re-raised to \$18. You have 10 ♦, 10 ♥. What do you do?

- Push all-in Re-raise to \$50 Call \$18 Fold

Page Break

Scenario 2

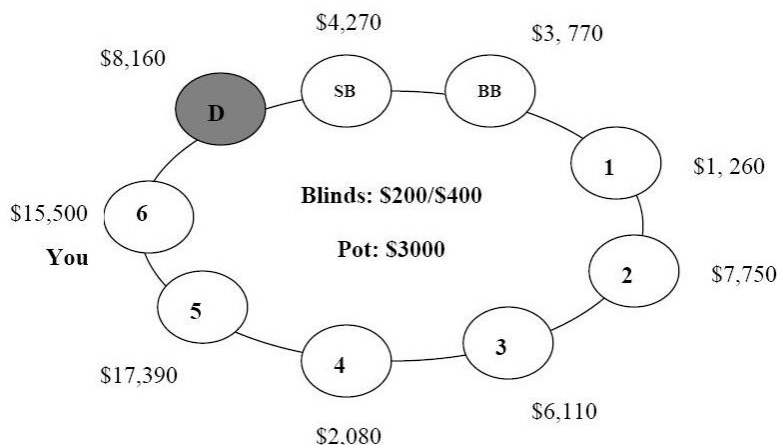


You are playing in a multi-table tournament. You are in a hand with two other players: Player 2 and the Player in dealer position. You have Queen ♣, 10 ♣. The board is Ace ♣, 7 ♣, 4 ♦, 9 ♥. Player 2 raised to \$300 pre-flop and bet \$700 on the flop. You and the player in dealer position called Player 2's raise before the flop and bet on the flop. Player 2 now bets \$2,000 after the turn card comes. What do you do?

- Fold Call \$2,000 Raise to \$4,500 Push all-in

Page Break

Scenario 3

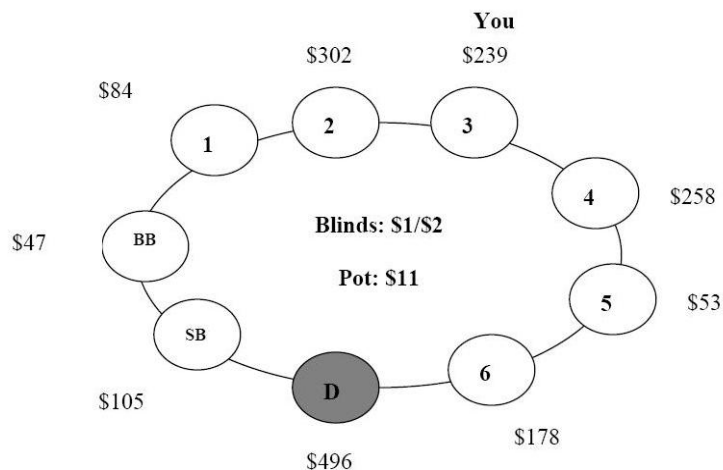


You are playing in a multi-table tournament. You are in a hand with one other player: Player 5. Players 1, 2, 3 and 4 all folded before the flop. Player 5 raised 3 times the blind to \$1200 before the flop. You have King ♥ Jack ♥. You called. The player in dealer position and the blinds all folded. The flop is Queen ♦, 10 ♠, 2 ♣. Player 5 bets \$2,000. What do you do?

- Fold Call \$2,000 Raise to \$5,000 Push all-in

Page Break

Scenario 4

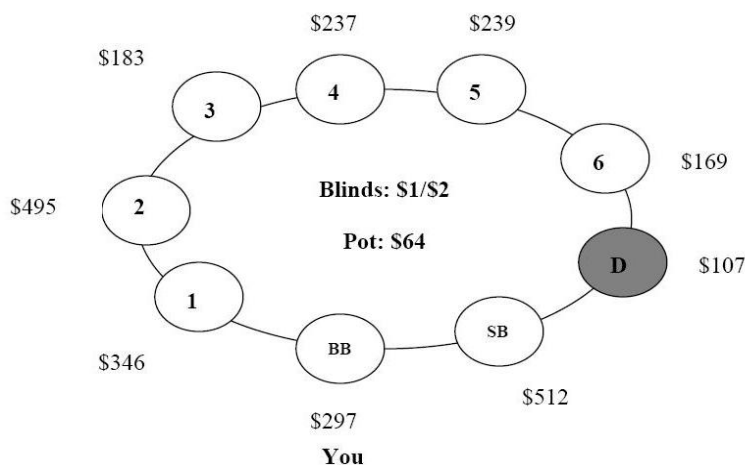


You are playing in a cash game. Player 1 makes the minimum raise to \$4 before the flop. Player 2 calls \$4. You have Ace ♦, 8 ♦. What do you do?

- Push all-in Re-raise to \$20 Call \$4 Fold

Page Break

Scenario 5

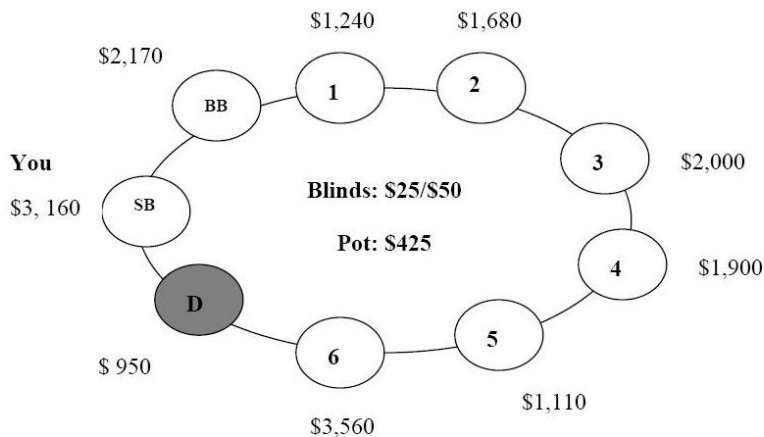


You are playing in a cash game. You are in a hand with two other players: Player 4 and Player 6. Players 1 through 3 folded before the flop. Player 4 raised 3 times the blind to \$6 before the flop. Player 5 folded, Player 6 called, and the players in Dealer position and Small blind folded. You called \$4 in the big blind.

Push all-in Raise to \$20 Raise to \$10 Call \$5

Page Break

Scenario 10



You are playing in a multi-table tournament. It is before the flop and Player 1 calls (limps in). Players 2, 3 and 4 all fold. Player 5 makes the minimum raise to \$100. Player 6 and the player in dealer position both call. You have Ace \heartsuit , 10 \clubsuit . What do you do?

Push all-in Re-raise to \$500 Call \$75 Fold

Page Break

Okay, now we are going to ask you a few questions about the text passage that you read earlier. Please answer them to the best of your ability. If you do not remember the answers, you can either make your best guess at an answer, or simply move on to the next page.....

Did you read the whole text passage?

Yes No Most of it Some of it

1. Who thought that the earth was stationary?

Kepler Aristotle Copernicus Galileo

2. What dealt the death blow to Aristotelian/Ptolemaic theory of planetary motion according to the text passage?

Invention of the telescope The discovery of new planets The understanding of lunar eclipses
 The idea of "fixed stars"

3. Who first proposed that the planets orbit the sun?

Kepler Copernicus Galileo Ptolemy

Thanks for all of your time so far! Just one more section to go. This last next set of questions are about your poker play...

1. How long have you been playing poker?

- Less than 6 months 6 months to a year 1 year to 5 years More than 5 years

2. How often do you play poker?

- Once a month or less Every couple of weeks or so Once or twice a week Everyday or almost everyday

3. How often do you discuss poker theory and/or strategy with friends, on online forums, etc.?

- Never Sometimes Often Almost everyday

4. How many poker strategy or theory books have you read?

- None 1 or 2 3 to 5 More than 5

5. How often do you read articles on poker strategy or theory on the internet or in magazines etc.?

- Never Sometimes Often Almost everyday

6. How would you describe your knowledge of poker statistics or odds?

- Poor Average Good Excellent

7. When you are playing poker, how difficult do you find it to calculate poker statistics or odds in your head?

- Very difficult Somewhat difficult Somewhat easy Very easy

8. How often do you play poker for real money?

- Never Sometimes Often Always

9. How often do you use a poker tracking software (i.e. Poker Tracker) or other method to study your poker play/hand history online?

- Never Sometimes Often Always I do not play online

10. Here is a chart that describes different types of poker players:

<p>Tight-Passive</p> <p>A Tight-Passive player plays sees very few flops. When they do make a hand they general prefer for their opponent to take the lead in betting. Tight passive players call more often than they bet, raise or check-raise.</p>	<p>Tight-Aggressive</p> <p>A Tight-Aggressive player sees very few flops. They tend to bet, raise and check-raise more often than they call.</p>
<p>Loose-Passive</p> <p>A Loose-Passive player likes to see a lot of flops. They also tend to call more often than bet, raise or check-raise.</p>	<p>Loose-Aggressive</p> <p>A Loose-Aggressive player likes to see a lot of flops. They tend to bet, raise and check-raise more often than they call.</p>

How would you best describe yourself as a poker player currently? Please indicate how you usually play, not how you would like to play.

Tight-Passive Loose-Passive Tight-Aggressive Loose-Aggressive

Page Break

11. What stakes do you currently play in ring games the most? (ring games are games in which the blinds do not increase but stay constant throughout game).

Micro stakes (\$.01/\$.02 - \$.02/\$.05) Low stakes (\$.05/\$.10 - \$.25/\$.50) Medium stakes (\$.50/1.00 - \$2.00-\$4.00) High stakes (\$3.00/\$6.00 - \$500-\$1000) I do not play ring games

12. What stakes do you currently play in tournaments and/or Sit & Go's the most?

Micro stakes (\$0.10 -\$1.00 buy-in) Low stakes (\$2.00 - \$5.00 buy-in) Medium stakes (\$6.00 - \$20 buy-in) High stakes (\$21 - \$500 buy-in)

13. What type of poker game do you play the most?

Multi-table tournaments Sit & Go's Ring games

14. Please indicate how many times you have played in the following environments:

	Never	Once or twice	3-5 times	6-10 times	10 + times
Online	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At a home game (a game at a person's home)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At a casino	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In a cardroom that is not a casino	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- At a bar or restaurant
- At a major tournament (i.e. WSOP, WPT, CPT etc.)

15. Where do you play most often?

- Online At a home game (a game at a person's home) At a casino In a cardroom that is not a casino At a bar or restaurant

16. Please click all of the types of poker that you have played?

- No Limit Texas Hold'em Limit Texas Hold'Em 7 Card Stud 7 Card Stud (Hi-Lo) 5 Card Stud 5 Card Draw Omaha Omaha (Hi-Lo) Razz Deuce to Seven Lowball Badugi Anaconda Crazy Pineapple Chicago Chinese Poker

17. Do you participate in other games? If so, please click the ones that you play:

- Blackjack Roulette Craps Slot Machines Sports Betting (e.g. hockey or football pools, Proline) Bridge Horse/dog race betting Keno or Bingo Backgammon Lottery tickets (lottery draws and scratch tickets) Chess Gin Euchre Other (please specify)

18. Has poker caused conflicts/problems in any of the following areas? Please click any that apply.

- Work School Friends Spouse/boyfriend/girlfriend Family Finances

Page Break

STUDY 2 Questionnaire

Why You Play

This first set of questions have to do with why you play poker...

For each of the following items, please circle the number that best represents the extent to which you agree with the reason given for playing poker. For example, if you don't agree with the statement at all, circle 1 "Don't agree at all"; if you moderately agree with the statement, circle 4 "Moderately agree"; if you agree strongly with the statement, circle 7 "Very strongly agree".

WHY DO YOU PLAY POKER?

	Don't agree at all			Moderately agree	Very strongly agree		
	1	2	3	4	5	6	7
1. Because it is exciting.	1	2	3	4	5	6	7
2. Because it makes me feel like somebody important.	1	2	3	4	5	6	7
3. For the feeling of competence that I get when I play poker.	1	2	3	4	5	6	7
4. Because, for me, it is the best way to relax completely.	1	2	3	4	5	6	7
5. I play, but sometimes I ask myself if I should continue to play.	1	2	3	4	5	6	7
6. Because playing allows me to test my capacity to control myself.	1	2	3	4	5	6	7
7. I play, but sometimes I ask myself what I get out of it.	1	2	3	4	5	6	7

8. To get rich.	1	2	3	4	5	6	7
9. To show others that I am a dynamic person.	1	2	3	4	5	6	7
10. For the pleasure I get at improving my knowledge of the game.	1	2	3	4	5	6	7
11. To buy something that I dream of.	1	2	3	4	5	6	7
12. Because it allows me to enjoy myself enormously.	1	2	3	4	5	6	7
13. Because it is the best way I know of to eliminate tension.	1	2	3	4	5	6	7
14. For the strong sensations I feel when I play.	1	2	3	4	5	6	7
15. For the satisfaction of learning new ways of playing.	1	2	3	4	5	6	7

CONTINUED ON NEXT PAGE

	Does not correspond			Corresponds moderately	Corresponds exactly		
16. To be envied by others.	1	2	3	4	5	6	7
17. Because it is the hobby I have chosen to clear my mind.	1	2	3	4	5	6	7
18. For the pleasure of knowing my abilities at this game.	1	2	3	4	5	6	7
19. For the satisfaction I feel when I can control the game.	1	2	3	4	5	6	7
20. For the curiosity of knowing what can happen in the game.	1	2	3	4	5	6	7
21. I play, but sometimes I feel I am not getting a lot out of it.	1	2	3	4	5	6	7
22. To make money quickly and easily.	1	2	3	4	5	6	7
23. Because it's the best way I know of to meet my friends.	1	2	3	4	5	6	7
24. For the feeling of control it gives me.	1	2	3	4	5	6	7

25. I play, but I sometimes ask myself if it is good for me.	1	2	3	4	5	6	7
26. Because when I win, I feel like someone important.	1	2	3	4	5	6	7
27. To make a lot of money.	1	2	3	4	5	6	7
28. For the thrill or the strong sensations it gives me.	1	2	3	4	5	6	7

General Attitudes

The next set of questions relate to your current general attitudes and beliefs...

Please indicate to what extent you agree with the following statements with respect to the general reasons why you do different things (please circle one response per question).

In general, I do things . . .	Don't agree at all	Very slightly agree	Slightly agree	Moderately agree	Mostly agree	Strongly agree	Very strongly agree
1. ... in order to help myself become the person I aim to be.	1	2	3	4	5	6	7
2. ... because I like making interesting discoveries.	1	2	3	4	5	6	7
3. ... because I want to be viewed more positively by certain people.	1	2	3	4	5	6	7
4. ... because I chose them as means to attain my objectives.	1	2	3	4	5	6	7
5. ... for the pleasure of acquiring new knowledge.	1	2	3	4	5	6	7
6. ... because I would beat myself up for not doing them.	1	2	3	4	5	6	7
7. ... because by doing them I am living in line with my deepest principles.	1	2	3	4	5	6	7
8. ... although it does not make a difference whether I do them or not.	1	2	3	4	5	6	7
9. ... for the pleasant sensations I feel while I am doing them.	1	2	3	4	5	6	7
10. ... in order to show others what I am capable of.	1	2	3	4	5	6	7

11. ... because I chose them in order to attain what I desire.	1	2	3	4	5	6	7
12. ... because otherwise I would feel guilty for not doing them.	1	2	3	4	5	6	7
13. ... even though I do not have a good reason for doing them.	1	2	3	4	5	6	7
14. ... in order to attain prestige.	1	2	3	4	5	6	7
15. ... even though I believe they are not worth the trouble.	1	2	3	4	5	6	7
16. ... because I would feel bad if I did not do them.	1	2	3	4	5	6	7
17.because by doing them I am fully expressing my deepest values.	1	2	3	4	5	6	7
18. ... because they reflect what I value most in life.	1	2	3	4	5	6	7

For the next set of questions, please circle the extent to which each statement applies to you...

	Does not describe me at all	Does not describe me very well	Describes me somewhat	Describes me very well
1. I can see how it would be interesting to marry someone from a foreign country.	1	2	3	4
2. When the water is very cold, I prefer not to swim even if it is a hot day.	1	2	3	4
3. If I have to wait in a long line, I'm usually patient about it.	1	2	3	4
4. When I listen to music, I like it to be loud.	1	2	3	4
5. When taking a trip, I think it is best to make as few plans as possible and just take it as it comes.	1	2	3	4
6. I stay away from movies that are said to be frightening or highly suspenseful.	1	2	3	4
7. I think it's fun and exciting to perform or speak before a group.	1	2	3	4
8. If I were to go to an amusement park, I would prefer to ride the rollercoaster or other fast rides.	1	2	3	4
9. I would like to travel to places that are strange and far away.	1	2	3	4
10. I would never like to gamble with money, even if I	1	2	3	4

could afford it.				
11. I would have enjoyed being one of the first explorers of an unknown land.	1	2	3	4
12. I like a movie where there are a lot of explosions and car chases.	1	2	3	4
13. I don't like extremely hot and spicy foods.	1	2	3	4
14. In general, I work better when I'm under pressure.	1	2	3	4
15. I often like to have the radio or TV on while I'm doing something else (i.e. reading, cleaning up etc.).	1	2	3	4
16. It would be interesting to see a car accident happen.	1	2	3	4
17. I think it's best to order something familiar when eating in a restaurant.	1	2	3	4
18. I like the feeling of standing next to the edge on a high place and looking down.	1	2	3	4
19. If it were possible to visit another planet or the moon for free, I would be among the first in line to sign up.	1	2	3	4
20. I can see how it must be exciting to be in a battle during a war.	1	2	3	4

How I Feel

The next set of questions pertains to how you are feeling...

The following items refer to ways you can feel about your life **in general**. Please indicate to what extent you agree or disagree with each of the items (circle one answer for each question).

	Strongly disagree	Moderately disagree	Slightly disagree	Slightly agree	Moderately agree	Strongly agree
1. I tend to be influenced by people with strong opinions.	1	2	3	4	5	6
2. In general, I feel I am in charge of the situation in which I live.	1	2	3	4	5	6
3. I think it is important to have new experiences that challenge how you think about yourself and the world.	1	2	3	4	5	6
4. Maintaining close relationships has been difficult and frustrating for me.	1	2	3	4	5	6
5. I live life one day at a time and don't really think about the future.	1	2	3	4	5	6
6. When I look at the story of my life, I am	1	2	3	4	5	6

pleased with how things have turned out.						
7. I have confidence in my opinions, even if they are contrary to the general consensus.	1	2	3	4	5	6
8. The demands of everyday life often get me down.	1	2	3	4	5	6
9. For me, life has been a continuous process of learning, changing, and growth.	1	2	3	4	5	6
10. People would describe me as a giving person, willing to share my time with others.	1	2	3	4	5	6
11. Some people wander aimlessly through life, but I am not one of them.	1	2	3	4	5	6
12. I like most aspects of my personality.	1	2	3	4	5	6
13. I judge myself by what I think is important, not by the values of what others think is important.	1	2	3	4	5	6
14. I am quite good at managing the many responsibilities of my daily life.	1	2	3	4	5	6
15. I gave up trying to make big improvements or changes in my life a long time ago.	1	2	3	4	5	6
16. I have not experienced many warm and trusting relationships with others.	1	2	3	4	5	6
17. I sometimes feel as if I've done all there is to do in life.	1	2	3	4	5	6
18. In many ways, I feel disappointed about my achievements in life.	1	2	3	4	5	6

For the following set of questions, please circle the answer option that best describes you (circle one answer per question).

	Almost never	Sometimes	Often	Almost always
1. It is easy for me to improve my bad mood.	1	2	3	4
2. It is easy for me to maintain my good mood for a long time.	1	2	3	4
3. When I feel bad, I can do something to distract myself.	1	2	3	4
4. When I am happy about something, I can savour this feeling for a long time.	1	2	3	4

1 or 2 More than 5

5) How often do you read articles on poker strategy or theory on the internet or in magazines etc.?

 Never Often Sometimes Almost everyday

6) How would you describe your knowledge of poker statistics or odds? (check one)

 Poor Good Average Excellent

7) When you are playing poker, how difficult do you find it to calculate poker statistics or odds in your head? (check one)

 Very difficult Somewhat easy Somewhat difficult Very easy

8) How often do you play poker for real money? (check one)

 Never Often Sometimes Always

9) How much money do you spend on poker in a month (This includes online deposits and live

cash entry to poker games)? Do not adjust your estimate to reflect any money won in games you play. **Note: If you do not currently play for real money skip to question**

13.

Please provide your best estimate: _\$_____

10) Do you consider yourself a winning poker player within the past year? (i.e. you have won

more money than you have lost). Please be honest.

If you have been playing poker for under a year, answer according to how long you have been playing.

Yes No

11) What stakes do you currently play in ring games **the most**? (ring games are games in which

the blinds do not increase but stay constant throughout game). **Note: if you do not play ring**

games please skip to question 12. (Please check one)

Micro stakes (\$.01/\$.02 - \$.02/\$.05)

Medium stakes (\$.50/1.00 - \$2.00-

\$4.00)

Low stakes (\$.05/\$.10 - \$.25/\$.50)

High stakes (\$3.00/\$6.00 - \$500-

\$1000)

12) What stakes do you currently play in tournaments and/or Sit & Go's **the most**?

(Please check one)

Micro stakes (\$0.10 - \$1.00 buy-in)

Medium stakes (\$6.00 - \$20 buy-in)

Low stakes (\$2.00 - \$5.00 buy-in)

High stakes (\$21 - \$500 buy-in)

13. What types of poker have you played? (please check all that apply)

No Limit Texas Hold'em

5 Card Draw

Badugi

Limit Texas Hold'Em

Omaha

Anaconda

7 Card Stud

Omaha (Hi-Lo)

Crazy Pineapple

7 Card Stud (Hi-Lo)

Razz

Chicago

5 Card Stud

Deuce to Seven Lowball

Chinese Poker

14) Please check all of the types of games you have you played and circle how many times you have played them.

Online Poker

<input type="checkbox"/>	Play money multi-table tournaments (more than 200 people entered)	Once or twice	3-5 times	6-9 times	10 + times
--------------------------	---	---------------	-----------	-----------	------------

<input type="checkbox"/>	Free qualifier	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Play money sit & go's (less than 200 people entered)	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Play money heads-up sit & go's	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Play money ring games	Once or twice	3-5 times	6-9 times	10 + times

<input type="checkbox"/>	Real money multi-table tournaments (more than 200 people entered)	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Real money qualifier	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Real money sit & go's (less than 200 people entered)	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Real money heads up sit & go's	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Real money ring games	Once or twice	3-5 times	6-9 times	10 + times

Live Poker (in person)

<input type="checkbox"/>	Free multi-table tournaments (more than 200 people entered)	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Free qualifier	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Free sit & go's (less than 200 people entered)	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Play money ring games	Once or twice	3-5 times	6-9 times	10 + times

<input type="checkbox"/>	Real money multi-table tournaments (more than 50 people entered)	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Real money qualifier	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Real money sit & go's (less than 50 people entered)	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Real money heads up sit & go's	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Real money ring games	Once or twice	3-5 times	6-9 times	10 + times

15) Please check all of the environments that you have played poker in and circle how many times you have played in them:

<input type="checkbox"/>	Online	Once or twice	3-5 times	6-10 times	10 + times
--------------------------	--------	------------------	--------------	---------------	---------------

<input type="checkbox"/>	At a home game (a game at a person's home)	Once or twice	3-5 times	6-10 times	10 + times
<input type="checkbox"/>	At a casino	Once or twice	3-5 times	6-10 times	10 + times
<input type="checkbox"/>	In a cardroom that is not a casino	Once or twice	3-5 times	6-10 times	10 + times
<input type="checkbox"/>	At a bar or restaurant	Once or twice	3-5 times	6-10 times	10 + times
<input type="checkbox"/>	At a major tournament (i.e. WSOP, WPT, CPT etc.)	Once or twice	3-5 times	6-10 times	10 + times

16) Where do you play most often? (please check one)

<input type="checkbox"/>	Online
<input type="checkbox"/>	At a home game (a game at a person's home)
<input type="checkbox"/>	At a casino
<input type="checkbox"/>	In a cardroom that is not a casino
<input type="checkbox"/>	At a bar or restaurant

17) Do you participate in other games? If so which one's? (please check all that apply)

- | | | |
|--|---|---------------------------------|
| <input type="checkbox"/> Blackjack | <input type="checkbox"/> Bridge | <input type="checkbox"/> Chess |
| <input type="checkbox"/> Roulette | <input type="checkbox"/> Horse/dog race betting | <input type="checkbox"/> Gin |
| <input type="checkbox"/> Craps | <input type="checkbox"/> Keno or Bingo | <input type="checkbox"/> Euchre |
| <input type="checkbox"/> Slot Machines | <input type="checkbox"/> Backgammon | <input type="checkbox"/> Other |
| <input type="checkbox"/> Sports Betting (e.g. hockey | <input type="checkbox"/> Lottery tickets (lottery | |

or football pools, Proline)

draws and scratch tickets)

18) Has poker caused conflicts/problems in any of the following areas? (check any that apply)

- | | |
|---------------------------------|--|
| <input type="checkbox"/> Work | <input type="checkbox"/> Spouse/boyfriend/girlfriend |
| <input type="checkbox"/> School | <input type="checkbox"/> Family |

Friends Finances

PLEASE TURN OVER FOR LAST PAGE

General Information

1) What is your age? (please print on line provided) _____

2) What is your gender? (please check) Male Female

3) What is your current marital status? (please check one)

 Single Married Common law In a relationship Widowed Divorced

4) Do you think of yourself as Native, First Nations, Inuit, or Metis? (check one)

 Yes No I don't know

5) Please check the race/ethnicity that best applies to you? (check one)

<input type="checkbox"/>	Arab/West Asian (e.g. Armenian, Egyptian, Persian or Iranian, Lebanese, Moroccan)	<input type="checkbox"/>	South Asian (e.g. East Indian, Pakistani, Punjabi, Sri Lankan)	<input type="checkbox"/>	Latin American (e.g. Spanish, Portuguese, Mexican, South American)
<input type="checkbox"/>	Black (e.g. African, Haitian, Jamaican, Somali)	<input type="checkbox"/>	South East Asian (e.g. Cambodian, Indonesian, Laotian, Vietnamese)	<input type="checkbox"/>	Japanese
<input type="checkbox"/>	Chinese	<input type="checkbox"/>	White (Caucasian)	<input type="checkbox"/>	Korean
<input type="checkbox"/>	Filipino	<input type="checkbox"/>	Mixed	<input type="checkbox"/>	I don't know
<input type="checkbox"/>	Other _____				

6) What is your current degree program? (please check one)

 Undergraduate Graduate Other

7) What is the name of your degree program (e.g. psychology)?

8) What year of your degree program are you in? (check one)

1st
 2nd
 3rd
 4th
 5th
 6th
 7th

9) What is your current student status? (please check one)

Full-time
 Part-time
 On-leave

STUDY 3 Questionnaire

Why You Play

This first set of questions have to do with why you play poker...

For each of the following items, please circle the number that best represents the extent to which you agree with the reason given for playing poker. For example, if you don't agree with the statement at all, circle 1 "Don't agree at all"; if you moderately agree with the statement, circle 4 "Moderately agree"; if you agree strongly with the statement, circle 7 "Very strongly agree".

WHY DO YOU PLAY POKER?

	Don't agree at all			Moderately agree	Very strongly agree		
	1	2	3	4	5	6	7
1. Because it is exciting.							
2. Because it makes me feel like somebody important.							
3. For the feeling of competence that I get when I play poker.							
4. Because, for me, it is the best way to relax completely.							
5. I play, but sometimes I ask myself if I should continue to play.							
6. Because playing allows me to test my capacity to control myself.							
7. I play, but sometimes I							

ask myself what I get out of it.								
8. To get rich.		1	2	3	4	5	6	7
9. To show others that I am a dynamic person.		1	2	3	4	5	6	7
10. For the pleasure I get at improving my knowledge of the game.		1	2	3	4	5	6	7
11. To buy something that I dream of.		1	2	3	4	5	6	7
12. Because it allows me to enjoy myself enormously.		1	2	3	4	5	6	7
13. Because it is the best way I know of to eliminate tension.		1	2	3	4	5	6	7
14. For the strong sensations I feel when I play.		1	2	3	4	5	6	7
15. For the satisfaction of learning new ways of playing.		1	2	3	4	5	6	7

CONTINUED ON NEXT PAGE

		Don't agree at all			Moderately agree	Very strongly agree		
16. To be envied by others.		1	2	3	4	5	6	7
17. Because it is the hobby I have chosen to clear my mind.		1	2	3	4	5	6	7
18. For the pleasure of knowing my abilities at this game.		1	2	3	4	5	6	7
19. For the satisfaction I feel when I can control the game.		1	2	3	4	5	6	7
20. For the curiosity of knowing what can happen in the game.		1	2	3	4	5	6	7
21. I play, but sometimes I feel I am not getting a lot out of it.		1	2	3	4	5	6	7
22. To make money quickly and easily.		1	2	3	4	5	6	7
23. Because it's the best way I know of to meet friends.		1	2	3	4	5	6	7
24. For the feeling of control it		1	2	3	4	5	6	7

gives me.								
25. I play, but I sometimes ask myself if it is good for me.		1	2	3	4	5	6	7
26. Because when I win, I feel like someone important.		1	2	3	4	5	6	7
27. To make a lot of money.		1	2	3	4	5	6	7
28. For the thrill or the strong sensations it gives me.		1	2	3	4	5	6	7

General Attitudes

The next set of questions relate to your current general attitudes and beliefs...

Please indicate to what extent you agree with the following statements with respect to the general reasons why you do different things (please circle one response per question).

In general, I do things . . .		Don't agree at all	Very slightly agree	Slightly agree	Moderately agree	Mostly agree	Strongly agree	Very strongly agree
1. ... in order to help myself become the person I aim to be.		1	2	3	4	5	6	7
2. ... because I like making interesting discoveries.		1	2	3	4	5	6	7
3. ... because I want to be viewed more positively by certain people.		1	2	3	4	5	6	7
4. ... because I chose them as means to attain my objectives.		1	2	3	4	5	6	7
5. ... for the pleasure of acquiring new knowledge.		1	2	3	4	5	6	7
6. ... because I would beat myself up for not doing them.		1	2	3	4	5	6	7
7. ... because by doing them I am living in line with my deepest principles.		1	2	3	4	5	6	7
8. ... although it does not make a difference whether I do them or not.		1	2	3	4	5	6	7
9. ... for the pleasant sensations I feel while I am doing them.		1	2	3	4	5	6	7
10. ... in order to show others what I am capable of.		1	2	3	4	5	6	7

11. ... because I chose them in order to attain what I desire.	1	2	3	4	5	6	7
12. ... because otherwise I would feel guilty for not doing them.	1	2	3	4	5	6	7
13. ... even though I do not have a good reason for doing them.	1	2	3	4	5	6	7
14. ... in order to attain prestige.	1	2	3	4	5	6	7
15. ... even though I believe they are not worth the trouble.	1	2	3	4	5	6	7
16. ... because I would feel bad if I did not do them.	1	2	3	4	5	6	7
17.because by doing them I am fully expressing my deepest values.	1	2	3	4	5	6	7
18. ... because they reflect what I value most in life.	1	2	3	4	5	6	7

For the next set of questions, please circle the extent to which each statement applies to you...

	Does not describe me at all	Does not describe me very well	Describes me somewhat	Describes me very well
1. I can see how it would be interesting to marry someone from a foreign country.	1	2	3	4
2. When the water is very cold, I prefer not to swim even if it is a hot day.	1	2	3	4
3. If I have to wait in a long line, I'm usually patient about it.	1	2	3	4
4. When I listen to music, I like it to be loud.	1	2	3	4
5. When taking a trip, I think it is best to make as few plans as possible and just take it as it comes.	1	2	3	4
6. I stay away from movies that are said to be frightening or highly suspenseful.	1	2	3	4
7. I think it's fun and exciting to perform or speak before a group.	1	2	3	4
8. If I were to go to an amusement park, I would prefer to ride the rollercoaster or other fast rides.	1	2	3	4
9. I would like to travel to places that are strange and far away.	1	2	3	4
10. I would never like to gamble with money, even if I	1	2	3	4

could afford it.				
11. I would have enjoyed being one of the first explorers of an unknown land.	1	2	3	4
12. I like a movie where there are a lot of explosions and car chases.	1	2	3	4
13. I don't like extremely hot and spicy foods.	1	2	3	4
14. In general, I work better when I'm under pressure.	1	2	3	4
15. I often like to have the radio or TV on while I'm doing something else (i.e. reading, cleaning up etc.).	1	2	3	4
16. It would be interesting to see a car accident happen.	1	2	3	4
17. I think it's best to order something familiar when eating in a restaurant.	1	2	3	4
18. I like the feeling of standing next to the edge on a high place and looking down.	1	2	3	4
19. If it were possible to visit another planet or the moon for free, I would be among the first in line to sign up.	1	2	3	4
20. I can see how it must be exciting to be in a battle during a war.	1	2	3	4

People often see some risk in situations that contain uncertainty about what the outcome or consequences will be and for which there is the possibility of negative consequences. However, riskiness is a very personal and intuitive notion, and we are interested in **your gut level assessment of how risky** each situation or behavior is.

	Not at all risky	Slightly Risky	Somewhat Risky	Moderately Risky	Risky	Very Risky	Extremely Risky
1. Admitting that your tastes are different from those of a friend.	1	2	3	4	5	6	7
2. Going camping in the wilderness.	1	2	3	4	5	6	7
3. Betting a day's income at the horse races.	1	2	3	4	5	6	7
4. Swimming far out from shore on an unguarded lake or ocean.	1	2	3	4	5	6	7
5. Investing 10% of your annual income in a moderate growth mutual fund.	1	2	3	4	5	6	7
6. Drinking heavily at a social function.	1	2	3	4	5	6	7

7. Taking some questionable deductions on your income tax return.	1	2	3	4	5	6	7
8. Disagreeing with an authority figure on a major issue.	1	2	3	4	5	6	7
9. Betting a day's income at a high-stake poker game.	1	2	3	4	5	6	7
10. Having an affair with a married man/woman.	1	2	3	4	5	6	7
11. Passing off somebody else's work as your own.	1	2	3	4	5	6	7
12. Going on vacation to a third-world country.	1	2	3	4	5	6	7
13. Arguing with a friend who has a different opinion on an issue.	1	2	3	4	5	6	7
14. Going down a ski run that is beyond your ability.	1	2	3	4	5	6	7
15. Investing 5% of your annual income in a very speculative stock.	1	2	3	4	5	6	7
16. Approaching your boss for a raise.	1	2	3	4	5	6	7
17. Going whitewater rafting at high water in the spring.	1	2	3	4	5	6	7
18. Betting a day's income on the outcome of a sporting event.	1	2	3	4	5	6	7
19. Investing 5% of your annual income in a dependable and conservative stock.	1	2	3	4	5	6	7
20. Engaging in unprotected sex.	1	2	3	4	5	6	7

CONTINUED FROM LAST PAGE...

	Not at all risky	Slightly Risky	Somewhat Risky	Moderately Risky	Risky	Very Risky	Very Risky
21. Revealing a friend's secret to someone else.	1	2	3	4	5	6	7
22. Driving a car without wearing a seat belt.	1	2	3	4	5	6	7
23. Investing 10% of your annual income in a new business venture.	1	2	3	4	5	6	7
24. Taking a weekend sky diving class.	1	2	3	4	5	6	7
25. Riding a motorcycle without a	1	2	3	4	5	6	7

helmet.								
26. Gambling a week's income at a casino.	1	2	3	4	5	6	7	
27. Choosing a career that you truly enjoy over a more prestigious one.	1	2	3	4	5	6	7	
28. Downloading proprietary software from the Internet.	1	2	3	4	5	6	7	
29. Reporting a neighbor or friend for some illegal activity.	1	2	3	4	5	6	7	
30. Speaking your mind about an unpopular issue in a meeting at work.	1	2	3	4	5	6	7	
31. Sunbathing without sunscreen.	1	2	3	4	5	6	7	
32. Bungee-jumping off a tall bridge.	1	2	3	4	5	6	7	
33. Piloting a small plane.	1	2	3	4	5	6	7	
34. Walking home alone at night in an unsafe area of town.	1	2	3	4	5	6	7	
35. Eating high cholesterol foods	1	2	3	4	5	6	7	
36. Driving while taking medication that may make you drowsy.	1	2	3	4	5	6	7	
37. Moving to a city far away from your extended family.	1	2	3	4	5	6	7	
38. Starting a new career in your mid-thirties.	1	2	3	4	5	6	7	
39. Leaving your young children alone at home while running an errand.	1	2	3	4	5	6	7	
40. Not returning a wallet you found that contains \$200.	1	2	3	4	5	6	7	

For the next set of questions, rate how well each of the following items describe you. Please rate each item as you are now, not as you wish to be in the future.

	Rarely / never	Occasionally	Often	Almost Always/Always
1. I plan tasks carefully.	1	2	3	4
2. I do things without thinking.	1	2	3	4
3. I make up my mind quickly.	1	2	3	4
4. I am happy-go-lucky.	1	2	3	4

5. I don't "pay attention."	1	2	3	4
6. I have "racing" thoughts.	1	2	3	4
7. I plan trips well ahead of time.	1	2	3	4
8. I am self-controlled.	1	2	3	4
9. I concentrate easily.	1	2	3	4
10. I save regularly.	1	2	3	4
11. I "squirm" at plays or lectures.	1	2	3	4
12. I am a careful thinker.	1	2	3	4
13. I plan for job security.	1	2	3	4
14. I say things without thinking.	1	2	3	4
15. I like to think about complex problems.	1	2	3	4
16. I change jobs.	1	2	3	4
17. I act "on impulse."	1	2	3	4
18. I get easily bored when solving thought problems.	1	2	3	4
19. I act on the spur of the moment.	1	2	3	4
20. I am a steady thinker.	1	2	3	4
21. I change residences.	1	2	3	4
22. I buy things on impulse.	1	2	3	4
23. I can only think about one thing at a time.	1	2	3	4
24. I change hobbies.	1	2	3	4
25. I spend or charge more than I earn.	1	2	3	4
26. I often have extraneous thoughts when thinking.	1	2	3	4
27. I am more interested in the present than the future.	1	2	3	4
28. I am restless at the theater or lectures.	1	2	3	4
29. I like puzzles.	1	2	3	4
30. I am future oriented.	1	2	3	4

For the next set of questions, rate how well each of the following items describe you.

	Completely False				Completely True
--	---------------------	--	--	--	--------------------

1. I have a logical mind.	1	2	3	4	5
2. I prefer complex problems to simple problems.	1	2	3	4	5
3. I believe in trusting my hunches.	1	2	3	4	5
4. I am not a very analytical thinker.	1	2	3	4	5
5. I trust my initial feelings about people.	1	2	3	4	5
6. I try to avoid situations that require thinking in depth about something.	1	2	3	4	5
7. I like to rely on my intuitive impressions.	1	2	3	4	5
8. I don't reason well under pressure.	1	2	3	4	5
9. I don't like situations in which I have to rely on intuition.	1	2	3	4	5
10. Thinking hard and for a long time about something gives me little satisfaction.	1	2	3	4	5
11. Intuition can be a very useful way to solve problems.	1	2	3	4	5
12. I would not want to depend on anyone who described himself or herself as intuitive.	1	2	3	4	5
13. I am much better at figuring things out logically than most people.	1	2	3	4	5
14. I usually have clear, explainable reasons for my decisions.	1	2	3	4	5
15. I don't think it is a good idea to rely on one's intuition for important decisions.	1	2	3	4	5
16. Thinking is not my idea of an enjoyable activity.	1	2	3	4	5
17. I have no problem thinking things through carefully.	1	2	3	4	5
18. When it comes to trusting people, I can usually rely on my gut feelings.	1	2	3	4	5
19. I can usually feel when a person is right or wrong, even if I can't explain how I know.	1	2	3	4	5
20. Learning new ways to think would be very appealing to me.	1	2	3	4	5

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	Completely False				Completely True
21. I hardly ever go wrong when I listen to my deepest gut feelings to find an answer.	1	2	3	4	5
22. I think it is foolish to make important decisions based on feelings.	1	2	3	4	5
23. I tend to use my heart as a guide for my actions.	1	2	3	4	5
24. I often go by my instincts when deciding on a course of action.	1	2	3	4	5
25. I'm not that good at figuring out complicated problems.	1	2	3	4	5
26. I enjoy intellectual challenges.	1	2	3	4	5
27. Reasoning things out carefully is not one of my strong points.	1	2	3	4	5
28. I enjoy thinking in abstract terms.	1	2	3	4	5
29. I generally don't depend on my feelings to help me make decisions.	1	2	3	4	5
30. Using logic usually works well for me in figuring out problems in my life.	1	2	3	4	5
31. I think there are times when one should rely on one's intuition.	1	2	3	4	5
32. I don't like to have to do a lot of thinking.	1	2	3	4	5
33. Knowing the answer without having to understand the reasoning behind it is good enough for me.	1	2	3	4	5
34. Using my gut feelings usually works well for me in figuring out problems in my life.	1	2	3	4	5
35. I don't have a very good sense of intuition.	1	2	3	4	5
36. If I were to rely on my gut feelings, I would often make mistakes.	1	2	3	4	5
37. I suspect my hunches are inaccurate as often as they are accurate.	1	2	3	4	5
38. My snap judgments are probably not as good as most people's.	1	2	3	4	5

39. I am not very good at solving problems that require careful logical analysis	1	2	3	4	5
40. I enjoy solving problems that require hard thinking.	1	2	3	4	5

How I Feel

The next set of questions pertains to how you are feeling...

The following items refer to ways you can feel about your life **in general**. Please indicate to what extent you agree or disagree with each of the items (circle one answer for each question).

	Strongly disagree	Moderately disagree	Slightly disagree	Slightly agree	Moderately agree	Strongly agree
1. I tend to be influenced by people with strong opinions.	1	2	3	4	5	6
2. In general, I feel I am in charge of the situation in which I live.	1	2	3	4	5	6
3. I think it is important to have new experiences that challenge how you think about yourself and the world.	1	2	3	4	5	6
4. Maintaining close relationships has been difficult and frustrating for me.	1	2	3	4	5	6
5. I live life one day at a time and don't really think about the future.	1	2	3	4	5	6
6. When I look at the story of my life, I am pleased with how things have turned out.	1	2	3	4	5	6
7. I have confidence in my opinions, even if they are contrary to the general consensus.	1	2	3	4	5	6
8. The demands of everyday life often get me down.	1	2	3	4	5	6
9. For me, life has been a continuous process of learning, changing, and growth.	1	2	3	4	5	6
10. People would describe me as a giving person, willing to share my time with others.	1	2	3	4	5	6
11. Some people wander aimlessly through life, but I am not one of them.	1	2	3	4	5	6
12. I like most aspects of my personality.	1	2	3	4	5	6
13. I judge myself by what I think is	1	2	3	4	5	6

important, not by the values of what others think is important.						
14. I am quite good at managing the many responsibilities of my daily life.	1	2	3	4	5	6
15. I gave up trying to make big improvements or changes in my life a long time ago.	1	2	3	4	5	6
16. I have not experienced many warm and trusting relationships with others.	1	2	3	4	5	6
17. I sometimes feel as if I've done all there is to do in life.	1	2	3	4	5	6
18. In many ways, I feel disappointed about my achievements in life.	1	2	3	4	5	6

For the following set of questions, please circle the answer option that best describes you (circle one answer per question).

	Almost never	Sometimes	Often	Almost always
1. It is easy for me to improve my bad mood.	1	2	3	4
2. It is easy for me to maintain my good mood for a long time.	1	2	3	4
3. When I feel bad, I can do something to distract myself.	1	2	3	4
4. When I am happy about something, I can savour this feeling for a long time.	1	2	3	4
5. It is difficult for me to control my bad mood.	1	2	3	4
6. When I am in a good mood, I am able to stay that way for a long time.	1	2	3	4
7. My bad mood lasts for a long time.	1	2	3	4
8. When I am in love, I can really enjoy this feeling.	1	2	3	4
9. I am at the mercy of my bad moods.	1	2	3	4
10. When I feel very good, I can allow myself to really surrender to this feeling.	1	2	3	4
11. When I am in a bad mood, I can find a way to get myself into a better mood.	1	2	3	4

***YOU ARE ALMOST DONE...

Poker Play

The next set of questions are related to your poker play...

1) How long have you been playing poker? (check one)

- | | |
|---|--|
| <input type="checkbox"/> Less than 6 months | <input type="checkbox"/> 1 year to 5 years |
| <input type="checkbox"/> 6 months to a year | <input type="checkbox"/> More than 5 years |

2) How often do you play poker? (check one)

- | | |
|--|--|
| <input type="checkbox"/> Once a month or less | <input type="checkbox"/> Once or twice a week |
| <input type="checkbox"/> Every couple of weeks or so | <input type="checkbox"/> Everyday or almost everyday |

3) How often do you discuss poker theory and/or strategy with friends, on online forums, etc.? (check one)

- | | |
|------------------------------------|--|
| <input type="checkbox"/> Never | <input type="checkbox"/> Often |
| <input type="checkbox"/> Sometimes | <input type="checkbox"/> Almost everyday |

4) How many poker strategy or theory books have you read? (check one)

- | | |
|---------------------------------|--------------------------------------|
| <input type="checkbox"/> None | <input type="checkbox"/> 3 to 5 |
| <input type="checkbox"/> 1 or 2 | <input type="checkbox"/> More than 5 |

5) How often do you read articles on poker strategy or theory on the internet or in magazines etc.?

- | | |
|------------------------------------|--|
| <input type="checkbox"/> Never | <input type="checkbox"/> Often |
| <input type="checkbox"/> Sometimes | <input type="checkbox"/> Almost everyday |

6) How would you describe your knowledge of poker statistics or odds? (check one)

- | | |
|----------------------------------|------------------------------------|
| <input type="checkbox"/> Poor | <input type="checkbox"/> Good |
| <input type="checkbox"/> Average | <input type="checkbox"/> Excellent |

13) When making decisions in poker, people can sometimes use hunches, feelings or instincts. How often do you use hunches, feelings or instincts when making decisions in poker?

Never

Often

Sometimes

Always

14) When making decisions in poker, people can sometimes use math, statistics or odds. How often do you use math, statistics or odds when making decisions in poker?

Never

Often

Sometimes

Always

15) How would you *best* describe yourself as a poker player currently? Please indicate how you *usually* play, not how you would like to play (Check one).

<input type="checkbox"/> Tight-Passive A Tight-Passive player plays sees very few flops. When they do make a hand they general prefer for their opponent to take the lead in betting. Tight passive players call more often than they bet, raise or check-raise.	<input type="checkbox"/> Tight-Aggressive A Tight-Aggressive player sees very few flops. They tend to bet, raise and check-raise more often than they call.
<input type="checkbox"/> Loose-Passive A Loose-Passive player likes to see a lot of flops. They also tend to call more often than bet, raise or check-raise.	<input type="checkbox"/> Loose-Aggressive A Loose-Aggressive player likes to see a lot of flops. They tend to bet, raise and check-raise more often than they call.

16) How much money do you spend on poker in a month (This includes online deposits and buy-ins to online poker games and live cash entry to poker games)? Do not adjust your estimate to reflect any money won in games you play. **Note: If you do not currently play for real money skip to question 20.**

Please provide your best estimate: _\$_____

17) Do you consider yourself a winning poker player within the past year? (i.e. you have won more money than you have lost). Please be honest.

If you have been playing poker for under a year, answer according to how long you have been playing.

- Yes No

18) What stakes do you currently play in ring games **the most?** (ring games are games in which the blinds do not increase but stay constant throughout game). **Note: if you do not play ring games please skip to question 19.** (Please check one)

- Micro stakes (\$.01/\$.02 - \$.02/\$.05) Medium stakes (\$.50/1.00 - \$2.00-\$4.00)
 Low stakes (\$.05/\$.10 - \$.25/\$.50) High stakes (\$3.00/\$6.00 - \$500-\$1000)

19) What stakes do you currently play in tournaments and/or Sit & Go's **the most?** (Please check one)

- Micro stakes (\$0.10 - \$1.00 buy-in) Medium stakes (\$6.00 - \$20 buy-in)
 Low stakes (\$2.00 - \$5.00 buy-in) High stakes (\$21 - \$500 buy-in)

20) Please check all of the types of games you have you played and circle how many times you have played them.

Online Poker

<input type="checkbox"/>	Play money multi-table tournaments (more than 200 people entered)	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Free qualifier	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Play money sit & go's (less than 200 people entered)	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Play money heads-up sit & go's	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Play money ring games	Once or twice	3-5 times	6-9 times	10 + times

<input type="checkbox"/>	Real money multi-table tournaments (more than 200 people entered)	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Real money qualifier	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Real money sit & go's (less than 200 people entered)	Once or twice	3-5 times	6-9 times	10 + times

<input type="checkbox"/>	Real money heads up sit & go's	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Real money ring games	Once or twice	3-5 times	6-9 times	10 + times

Live Poker (in person)

<input type="checkbox"/>	Free multi-table tournaments (more than 50 people entered)	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Free qualifier	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Free sit & go's (less than 50 people entered)	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Play money ring games	Once or twice	3-5 times	6-9 times	10 + times

<input type="checkbox"/>	Real money multi-table tournaments (more than 50 people entered)	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Real money qualifier	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Real money sit & go's (less than 50 people entered)	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Real money heads up sit & go's	Once or twice	3-5 times	6-9 times	10 + times
<input type="checkbox"/>	Real money ring games	Once or twice	3-5 times	6-9 times	10 + times

21) Please check all of the environments that you have played poker in and circle how many times you have played in them:

<input type="checkbox"/>	Online	Once or twice	3-5 times	6-10 times	10 + times
<input type="checkbox"/>	At a home game (a game at a person's home)	Once or twice	3-5 times	6-10 times	10 + times
<input type="checkbox"/>	At a casino	Once or twice	3-5 times	6-10 times	10 + times
<input type="checkbox"/>	In a cardroom that is not a casino	Once or twice	3-5 times	6-10 times	10 + times
<input type="checkbox"/>	At a bar or restaurant	Once or twice	3-5 times	6-10 times	10 + times
<input type="checkbox"/>	At a major tournament (i.e. WSOP, WPT, CPT etc.)	Once or twice	3-5 times	6-10 times	10 + times

23) Where do you play most often? (please check one)

<input type="checkbox"/>	Online
<input type="checkbox"/>	At a home game (a game at a person's home)
<input type="checkbox"/>	At a casino
<input type="checkbox"/>	In a cardroom that is not a casino
<input type="checkbox"/>	At a bar or restaurant

24) What types of poker have you played? (please check all that apply)

- | | | |
|---|---|--|
| <input type="checkbox"/> No Limit Texas Hold'em | <input type="checkbox"/> 5 Card Draw | <input type="checkbox"/> Badugi |
| <input type="checkbox"/> Limit Texas Hold'Em | <input type="checkbox"/> Omaha | <input type="checkbox"/> Anaconda |
| <input type="checkbox"/> 7 Card Stud | <input type="checkbox"/> Omaha (Hi-Lo) | <input type="checkbox"/> Crazy Pineapple |
| <input type="checkbox"/> 7 Card Stud (Hi-Lo) | <input type="checkbox"/> Razz | <input type="checkbox"/> Chicago |
| <input type="checkbox"/> 5 Card Stud | <input type="checkbox"/> Deuce to Seven Lowball | <input type="checkbox"/> Chinese Poker |

25) Do you participate in other games? If so which one's? (please check all that apply)

- | | | |
|--|--|---------------------------------|
| <input type="checkbox"/> Blackjack | <input type="checkbox"/> Bridge | <input type="checkbox"/> Chess |
| <input type="checkbox"/> Roulette | <input type="checkbox"/> Horse/dog race betting | <input type="checkbox"/> Gin |
| <input type="checkbox"/> Craps | <input type="checkbox"/> Keno or Bingo | <input type="checkbox"/> Euchre |
| <input type="checkbox"/> Slot Machines | <input type="checkbox"/> Backgammon | <input type="checkbox"/> Other |
| <input type="checkbox"/> Sports Betting (e.g. hockey or football pools, Proline) | <input type="checkbox"/> Lottery tickets (lottery draws and scratch tickets) | _____ |

26) Has poker caused conflicts/problems in any of the following areas? (check any that apply)

- | | |
|----------------------------------|--|
| <input type="checkbox"/> Work | <input type="checkbox"/> Spouse/boyfriend/girlfriend |
| <input type="checkbox"/> School | <input type="checkbox"/> Family |
| <input type="checkbox"/> Friends | <input type="checkbox"/> Finances |

General Information

1) What is your age? (please print on line provided) _____

2) What is your gender? (please check) Male Female

3) What is your current marital status? (please check one)

- Single Married Common law
 In a relationship Widowed Divorced

4) Please check the race/ethnicity that best applies to you? (check one)

<input type="checkbox"/>	Arab/West Asian (e.g. Armenian, Egyptian, Iranian, Lebanese)	<input type="checkbox"/>	South Asian (e.g. East Indian, Pakistani, Sri Lankan)	<input type="checkbox"/>	Latin American (e.g. Spanish, Portuguese, Mexican,)
<input type="checkbox"/>	Black (e.g. African, Haitian, Jamaican, Somali)	<input type="checkbox"/>	South East Asian (e.g. Cambodian, Indonesian, Laotian, Vietnamese)	<input type="checkbox"/>	Japanese
<input type="checkbox"/>	Chinese	<input type="checkbox"/>	White (Caucasian)	<input type="checkbox"/>	Korean
<input type="checkbox"/>	Filipino	<input type="checkbox"/>	Mixed	<input type="checkbox"/>	I don't know
<input type="checkbox"/>	Native, First Nations, Inuit, or Metis	<input type="checkbox"/>	Other _____		

5) What is your current degree program? (If you are not a student skip to question 9)

- Undergraduate Graduate Other

6) What is the name of your degree program (e.g. psychology)?

7) What year of your degree program are you in? (check one)

- 1st 2nd 3rd 4th 5th 6th 7th

8) What is your current student status? (please check one)

Full-time Part-time On-leave

9) What is your current employment status? (check one)

Full-time

 Part-time On-leave Unemployed