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A Comparison of Risk-Taking Measures

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Abstract

Risk-taking is an important construct that correlates with many areas of study such as substance abuse, psychological disorders, life-span changes and military involvement. As risk-taking is such a broadly defined construct, there are many different means used to measure it. Ironically, there has never been a study done to see whether or not these measures are looking at the same type of risk-taking. Our study investigated the differences and similarities in three risk-taking measures, the Balloon Analogue Risk-Task (BART), the TCU Self-Rating Form and the Domain-Specific Risk-Taking scale (DOSPERT). We analyzed the results within each participant to see whether or not the same form of risk-taking was being evaluated by each measure. Our analysis shows that there are few correlations between the subscales of the BART, the TCU Self-Rating form and the DOSPERT, implying differences in the types of risk-taking being measured by each scale.

A Comparison of Risk-Taking Measures

Risk-taking behaviors are common to everyone, however the level to which risk is taken varies drastically from person to person. Risk-taking is a broad term that can be defined in many different ways. It can be described as the propensity to take risks in the present and the future. It can be divided into different categories such as taking risks in finances, ethics, social situations, health and recreation. The broadest definition is simply taking part in an activity that may be deemed to be dangerous in some way. However, everyone has different definitions of “dangerous” and therefore everyone has different ideas of levels of risk-taking.

For proper assessment of levels of risk-taking, there has to be a measure that accounts for all of the different categories of risk-taking. This is difficult given that the concept of risk-taking is so expansive. Because risk-taking is such a broad construct, numerous scales have been developed. However, it is unclear whether these different scales are actually all measuring the same thing (i.e., risk-taking). A dissonance of scales can be a problem when the results are important to an individual’s health, such as in a situation like a switch in the use of practitioners that use different treatment techniques for clients who display different levels of risk-taking. If two risk-taking scales are used that are thought to measure the same construct but in reality do not, a client’s entire treatment plan may be altered along with their course to recovery. Another serious situation where a risk-taking scale may be used could be in a court case. The declaration of how high an individual’s risk-taking levels are could mean the difference between jail time and being deemed able to assimilate back into society. It could be a life changing verdict, and if one measure is utilized and concludes that the individual has a low propensity to take risks but another measure is given in which their level of risk-taking is assessed as high, which one determines the individual’s fate? Without a study to determine whether or not all the methods

coincide and give similar results, it is impossible to accurately evaluate research that makes claims about human risk-taking. The current study will be utilizing the Balloon Analogue Risk-Task, the Domain Specific Risk Task and the TCU Self-Rating Form to determine whether or not they yield comparable levels of risk-taking assessment and whether they measure equivalent constructs. It is important though to first look at the various uses of risk-taking measures.

Uses of Risk-Taking Measures

Scores on risk-taking measures have been shown to predict important psychological outcomes in a number of domains such as substance abuse and psychological disorders. In terms of substance abuse, recent work indicates that that impulsivity and risk-taking may be related to drug use and that the relationship may differ across drug classes. A study by Bornovalova et al (2005) was conducted to determine whether or not the type of drug used determined the risk-taking level of the individual. The results of the study indicated that crack cocaine users were significantly more prone to risk than heroin users. Another study conducted in South Africa by Peltzer, Malaka and Phaswana in 2001 found that levels of risk-taking do rise with certain kinds of substance abuse, such as alcohol, cannabis and tobacco, but had no correlation with others. This information could help greatly in finding different treatment plans for substance abusers with different addictions. Another study by Skeel, Pilarski, Pytlak and Neudecker (2008) compared personality traits, novelty seeking and harm avoidance, and risk-taking and found that they were both highly correlated with alcohol abuse. Researchers suggest that risk-taking as a general personality trait may more readily distinguish nonusers from users of various drugs than discriminate among degrees of use in drug abusers (Adlaf & Smart, 1983). However, in a study by Butler and Montgomery in 2004, it was found that the level of risk-taking was positively correlated with the amount of ecstasy taken. It is important for a study to be done to evaluate

risk-taking measures because without a comparison, it will never be known whether or not they are measuring similar constructs (i.e. risk-taking). Without the current study analyzing the risk-taking measures side by side, it may be hard to determine which measure to use to assess each individual drug abuser, since the subsequent treatment plans are so dependent of the person's levels of risk-taking, relapsing and personality.

Another common use of risk-taking measures is to measure risk-taking in relation to psychological disorders. For example, Holmes et al (2009) conducted a study to determine whether or not those with bipolar disorder and a history of alcohol abuse were more or less likely to score high on a risk-taking task than those with bipolar disorder that had no known history of alcohol abuse. The results showed that those with bipolar disorder and a past history of alcohol abuse showed much higher risk-taking tendencies than those with bipolar and no history of alcohol abuse. Those who had a past of only alcohol abuse scored higher on the risk-taking scale than the control group but lower than those co-morbid for bipolar disorder. Similarly, a study was conducted by Butler and Montgomery in 2005 to test the amount of risk-taking found in those with anorexia nervosa. The results indicated that those with anorexia nervosa self-reported that they were low risk takers, but in the applied risk-taking task they actually had higher risk-taking tendencies than the control group. A similar study by Swogger, Walsh, Lejuez and Kosson (2010) was completed with inmates who had externalizing disorders, such as antisocial personality disorder, alcohol use disorders, and drug use disorders. This study found that exactly the opposite was true: those with externalizing disorders reported being greater risk-takers, but when they were given a real-life risk-taking task, their levels of risk-taking were no higher than those of the control group. Those with Obsessive Compulsive Disorder have been found to be much more averse to risk than control groups (Steketee & Frost, 1994). This may mean that

those with OCD need a more gradual treatment plan due to the fact that they are unlikely to take risks. These studies highlight the importance of knowing the levels of risk-taking for an individual with a psychological disorder before an intervention or a treatment plan is developed or put into action.

Risk-taking measures are commonly used to measure levels of risk-taking over the course of a person's life to see if they change over time. A study was conducted in Turkey by Bayar and Sayil in 2005 to compare risk-taking between males and females over the course of their lives. It was found that all risky behaviors increased until early adulthood and then decreased, and that boys engaged in more risk-taking behaviors than the girls on most of the tasks. Another study was completed by Gonzalez, Field, Yando and Gonzalez in 1994 with adolescent athletes to examine whether or not those in athletics exhibited higher levels of risk-taking than their classmates. The study found evidence for this hypothesis, as well as a significant correlation between high risk-taking and high self-esteem. A computerized risk-taking measure was used by Mitchell, Schoel and Stevens in 2008 to compare the levels of risk-taking in adolescents to those of adults. The authors found that adolescents were higher risk takers, overall showing more risk-taking tendencies, than the adults. This information would be helpful simply in noting differences in interactions with children compared to adults as well as explain differences in typical childhood activities compared to those adults classically participate in. Rios-Bedoya, Wilcox, Piazza and Anthony (2008) completed a study in an elementary school that used level of risk-taking early in life to predict use of drugs in adulthood. The researchers found that those with higher risk-taking levels as children were more likely to use cocaine or cannabis in their adulthood than their peers but that use of legal drugs, such as alcohol and tobacco, could not be predicted by the results of the tests. Therefore, it appears as if measuring risk-taking behavior in

children may help predict which children are more likely to use drugs later in life and may help determine which children to target for drug prevention programs.

The last common use of risk-taking measures is a fairly new idea. These studies measure the level of risk-taking among military personnel. One study was conducted by Miller and Morrison (1971) to observe the level of risk-taking in those who actually had no intention of joining the military but were still classified as consciously objected to joining the military verses those who unconsciously objected to joining the military. Those who were consciously objected to joining the military were those who, if asked, would say they were objected to joining the military. Those who were unconsciously objected to joining the military were those who, if asked, would say they wouldn't mind joining the military, but after given several measures were deemed to be the ones most likely to try to get out of the duty if placed in that situation. The study found that there was no difference in risk-taking levels between the two test groups. Risk-taking scales have been used with those entering the military in order to determine whether or not individuals are prone to taking risks that would be detrimental to their mission (Momen et. al., 2010). Another interesting study conducted by Tull et. al. in 2009 examined the correlation between participants with Post-Traumatic Stress Disorder (PTSD) that were dependent on cocaine and those with PTSD that were not dependent and the differences in their propensity to take risks. This study found that those with PTSD and a cocaine dependency were much higher risk-takers than those that had PTSD but had no dependency. The researchers also found that those with a cocaine dependency alone had higher risk-taking levels than those with only PTSD but had lower levels than those with both PTSD and a cocaine dependency. Knowing the risk-taking levels of active soldiers and those returning from war is a huge part in the participants re-assimilating themselves with the general population. Increased risk-taking levels have been

correlated with more action taken on PTSD symptoms, such as flashbacks, hallucinations and paranoia, which could be dangerous to themselves and those around them during these triggers. After the current study is completed, enough information on the reaches and boundaries of risk-taking measures will be available to decide which scale is the most suitable to assess soldiers for their risk-taking levels, and more time can be put into the treatment for their PTSD symptoms.

Commonly Used Risk-Taking Measures

In my research of the literature, I have seen three risk-taking measures used more than all the others. The Balloon Analogue Risk Task (BART), the Domain Specific Risk Task (DOSPERT) and the TCU Self-Rating Form have been noted in numerous articles as being valid ways to assess risk-taking. The study that I am proposing will be comparing these three instruments to determine whether or not they produce comparable results and if they measure equivalent constructs.

The BART is extremely versatile and widely used. However, the BART is normally utilized in studies examining risk-taking in substance abusers. There are two different versions: however they both measure the same thing with only slight differences in the delivery. A study was conducted by Bornovalova, et al., in 2009 that used the BART to analyze how performance on a task would vary as a function of reward/loss value and also how it related to personality traits. Results indicated that riskiness on the BART decreased as reward/loss magnitude increased and that these results were more easily seen in low sensation-seekers as compared to high sensation-seekers. This means that although it is observed that as the risk being presented increased, risk-taking for both high and low sensation-seekers decreased, it was much more obvious in those that were low sensation-seekers. Those that were high sensation-seekers still took far more risks than those who were low sensation-seekers, no matter how substantial the

risk was. Another study conducted by Bornovalova, et al., in 2005 used the BART in order to determine whether or not drug use affects risk-taking. This study tested risk-taking across individuals that were using different types of drugs to see if the subtype of drug mattered as far as risk-taking was concerned. They found crack cocaine users engage in higher levels of risk-taking behaviors than did heroin users. The BART was also used in a study conducted by Holmes et al (2009) that examined the relationship between bipolar disorder, alcohol abuse and risk-taking tendencies. The study found that those with bipolar disorder and a past of alcohol abuse showed less propensity to correct past mistakes made in the BART than those with bipolar disorder but no history of alcohol abuse. Another study conducted by Skeel, Pilarski, Pytlak and Neudecker (2008), in which the BART was used along with a personality test, found that personality and propensity to take risks were both highly correlated to each other and were good predictors of future alcohol use. The BART can be used in correlation with many other scales, reviewed later in this discussion, and has been around for a long time which that is why it is so widely utilized.

The next scale, the DOSPERT, was utilized by Momen, et al., in 2010 to determine the level of risk-taking seen in those entering the military to determine whether participants were prone to taking risks that would be detrimental to their mission. This is an extremely important use of a risk-taking scale because it can determine which soldiers to put at the front line to make crucial decisions and which soldiers to keep out of decision making positions. Another study was conducted by Soane, Dewberry and Narendran in 2010 that used the DOSPERT to determine whether or not the different domains of risk-taking would be affected by personality and perceptions of costs and benefits. It was found that personality affected the social, ethical, recreational and financial (i.e. gambling and investment) subcategories of risk-taking and that

perceptions of costs and benefits directly affected the social, ethical, recreational and financial domains of risk-taking. The DOSPERT has not been around nearly as long as the BART and therefore has been utilized in far fewer studies than the BART.

The last scale, the Texas Christian University (TCU) Self-Rating Form, is a broad measure that contains many sub-categories such as self-esteem, anxiety, decision making confidence and social conformity. Due to its extensive content, its uses vary greatly from study to study. It has been utilized to determine the level of risk-taking as it is correlated with suicidality. It has been found that as the severity of the suicide attempts increases, so do the levels of risk-taking (Chatham, Knight, Joe & Simpson, 1995). The level of risk-taking was also positively correlated with the level of help wanted after admission to a clinic. Another study was conducted by Knight, Holcom and Simpson in 2004 to determine how many correlations between risk-taking and other life factors could be found. The researchers found that higher risk-taking is positively correlated with depression, anxiety, childhood problems and hostility among youth and directly negatively correlated with self-esteem and social conformity.

Again, no previous studies have been done to determine whether these different scales are actually all measuring the same type of risk taking. The hypothesis of the current study is that all three scales will yield comparable results of risk-taking levels for each individual. By examining the relationship and similarity in results between these three measures, professionals who need to assess risk-taking will be able to administer one of these measures and be confident in their consistency across each other, and therefore, will be more confident in their findings.

Method

Participants

For this study, 59 English-speaking male and female participants were recruited using SONA System from psychology classes at a moderate sized university in the Midwest. The SONA System aids in research by managing scheduling, recruitment, and the distribution of extra credit. This program is free and open to any student interested in participating in research through the university. The undergraduate age range represented was 18 – 39 years old. Other than being able to read and write in English, there were no specific limitations on the undergraduate sample included in this research.

Measures

Risk-Taking. Participants completed two paper and pencil surveys. The first measure used was a revised version of the Domain-Specific Risk-Attitude Scale, or the DOSPERT (Weber, Blais and Betz, 2002). This is a self-report survey measure. The scale covers five different categories of risk-taking: ethical, financial, health, social and recreational risks. There are a total of 30 statements and participants are asked to determine how likely they were to participate in the activity presented in the future. They responded on a 7-point Likert-type scale with 1 being “extremely unlikely” to 7 being “extremely likely”.

The second risk-taking scale used was the TCU Self-Rating Form (Knight, Holcom and Simpson, 1994). There are 5 subscales to this measure including self-esteem, anxiety, decision-making confidence, risk-taking and social conformity. Instead of asking each participant how likely they are to participate in a risky situation, it lists 37 statements about current risk-taking. The measure uses a 5-point Likert-type scale, with 1 being “disagree” to 5 being “strongly agree.”

Participants also completed the Balloon Analogue Risk Task, or the BART, which is a computer based risk-assessment model (Lejuez et al., 2002). The BART is different from the other two measures in that it gauges risk-taking in the moment as opposed to using a self-report model. During the BART, participants fill 30 computer-generated balloons with air. The balloons come in different colors and with different capacities for air. The purpose of the measure is to fill up the balloons but not to let them pop. The participants gain points every time they put a pump of air into the balloon, but sometime between 1 and 128 pumps, the balloon pops. If the balloon pops, the participants lose all the points from that round. However, if they quit the round before the balloon pops, their points are logged in a bank. These points cannot be lost. The higher the level of risk-taking in the individual, the more pumps the participant will put in each balloon before they pop and the more popped balloons they will have.

After all three of these measures were completed, they were compared using Pearson's Correlation. The analysis will compare participant's scores across measures to see whether or not they are similar. After this analysis is completed, it will be clear whether or not the three measures are comparable in what they are measuring (i.e. risk-taking levels).

Procedure

Participants signed up for sessions that were held in a research room in the Psychology department at the university. When participants arrived, they were told the general purpose of the study (i.e. that we were interested in learning about college students' risk-taking tendencies). They were invited to look over and sign a consent form which was be kept separate from, and never referenced, their assigned participant number or materials generated within the data collection session.

If the participants provided consent to participate in the study they were given the three measures in random order. Participants finished all three measures and gave the completed paper measures back to the experimenter while the computer measure data was saved online. Upon completing all three measures, participants were debriefed and given a sheet to take home including the principal investigator's contact information and a reference to the campus counseling center. Experimenters did not look at the completed measures, which were immediately stored inside of a locked file cabinet.

Results were only reviewed, and data entered, after several weeks had elapsed after each participant completed the study, again to ensure the anonymity of responses.

Results

Results of all three measures were compared within each participant using Pearson Correlations within SPSS data management software. Our hypothesis, that the BART, the DOSPERT and the TCU Self-Rating Form would yield comparable results of risk-taking levels for each individual, was not supported because even though quite a few correlations were found within subscales of the same measure, only a few significant correlations were found across measures.

To explain these tables a little further, there are some significant correlations found between subscales of the same measure using a two-tailed test. In the DOSPERT there are significant correlations at the .01 level of significance between the subscales labeled Ethical and Health and Safety ($r=.43$, $p<.01$), Ethical and Recreational ($r=.34$, $p<.01$), Ethical and the DOSPERT Average ($r=.49$, $p<.01$), Financial and Health and Safety ($r=.46$, $p<.01$), Financial and the DOSPERT Average ($r=.58$, $p<.01$), Health and Safety and Recreational ($r=.60$, $p<.01$), Health and Safety and the DOSPERT Average ($r=.80$, $p<.01$), Social and Recreational ($r=.43$,

$p < .01$), Social and the DOSPERT Average ($r = .55$, $p < .01$) and Recreational and the DOSPERT Average ($r = .83$, $p < .01$) (Table 1.3). In the DOSPERT, there are significant correlations between the subscales labeled Financial and Recreational ($r = .32$, $p < .05$) (Table 1.3).

In the TCU Self-Rating Form, there are significant correlations between the subscales labeled Self Esteem and Anxiety ($r = .40$, $p < .01$), Self Esteem and TCU Self-Rating Form Average ($r = .40$, $p < .01$), Anxiety and TCU Self-Rating Form Average ($r = .70$, $p < .01$), Decision Making Confidence and Social Conformity ($r = .43$, $p < .01$), Decision Making Confidence and TCU Self-Rating Form Average ($r = .59$, $p < .01$), Risk-Taking and TCU Self-Rating Form Average ($r = .50$, $p < .01$) and Social Conformity and TCU Self-Rating Form Average ($r = .54$, $p < .01$) (Table 1.2). In the TCU Self-Rating Form, there are significant correlations between the subscales labeled Social Conformity and Anxiety ($r = .28$, $p < .05$) (Table 1.2).

In the BART, there is a significant correlation between average pumps per balloon and total explosions ($r = .91$, $p < .01$) (Table 1.6).

We found four significant correlations across measures. Correlations were found between the DOSPERT Health and Safety subscale and the TCU Self-Rating Form, Decision Making Confidence subscale ($r = -.31$, $p < .05$), between the DOSPERT Average and the TCU Self-Rating Form, Decision Making Confidence subscale ($r = -.31$, $p < .05$), between the DOSPERT Recreational subscale and the TCU Self-Rating Form, Decision Making Confidence subscale ($r = -.36$, $p < .01$), and between the TCU Self-Rating Form, Anxiety subscale and the average pumps per balloon on the BART ($r = -.26$, $p < .05$) (Tables 1.1 & 1.4).

Discussion

Significant negative correlations were between the TCU Self-Rating Form, Decision Making Confidence subscale and three other subscales; the DOSPERT Health and Safety

subscale, the DOSPERT Average and the DOSPERT Recreational subscale. This means that as the participants find it harder to make a decision, which means they ponder over every little detail and look at every scenario, their propensity to take risks that affect their health and safety, their recreation and other risks in general goes down. The other significant negative correlation found was between the TCU Self-Rating Form, Anxiety subscale and the average pumps per balloon on the BART. This means that as the reflective perception of each participant's anxiety went up, the amount of pumps the participants put into each balloon on the BART went down. This shows that as the more anxious a participant thought they were, the less risky decisions they made while performing on the BART. The participant's anxiety was not directly measured while they were performing on the BART, but this is the correlation between the anxiety subscale of the TCU Self-Rating Form and the average pumps per balloon on the BART.

From the data, it was determined that the DOSPERT, the BART and the TCU Self-Rating Form do not measure the same construct of risk-taking since there were hardly any significant correlations between subscales, between measures. This study can be used as a beacon to showcase the importance of a few fundamental concepts of science. The importance of validity and reliability are cornerstones in science today. Without them, the field would be much less empirical and others might see scientist's findings as unreliable.

Defining constructs simply means that whatever is being measured needs to have a clear, agreed upon definition. This is important so that everyone has the same idea of what it is that is being measured. The extent to which a test measures what it claims to measure is called the test's validity. Everyone's definition of risk-taking might be different but for risk-taking to be a measurable construct everyone must agree on the exact definition of what is being evaluated. This study shows that the definition of the risk-taking construct is not the same across measures

because there was very little if any correlation between the DOSPERT, the TCU Self-Rating Form and the BART. It should be known that if it is claimed that the three measures we tested in this study are looking at the same construct of risk-taking, the fact is that their subscales do not significantly correlate, so they should not be used interchangeably to measure the same thing.

Re-testing is simply another way of showing that your findings are reliable. Proving reliability, even more so than accurately defining constructs, is a building block of science. Showing that no matter where and when the research happens, the results will always be comparable, is a great way to show that the research is legitimate. More brains are better than one when working on a problem. So the greater the number of people that run the study the more the study will be perfected and the more believable the results will be.

Re-testing is also a great way to find errors in the research. In this study, we were able to find that the DOSPERT, the TCU Self-Rating Form and the BART might all measure risk-taking but they are all measuring different types of risk-taking. This is important knowledge to have so that the measures are not used interchangeably and assumed to produce the same picture of the participant's risk-taking. In the future, we could add more risk-taking scales into the equation just to see which are comparable.

There were a few aspects of this study that limited our findings. The biggest one, once again, is that we did not reach the number of participants necessary to achieve sufficient power to detect findings. Something I would do in a future study would be to run everything online so that the participants would not have to take time out of their day to actually show up on campus and participate. If it was online, it would be much more convenient for everyone to take part and more people might have participated. However, running the participants online could also lead to less serious responses.

Another thing that might have limited the study is that there was very little diversity between participants, due to the fact that the study was conducted on a college campus. This can be a problem in the different subscales of risk-taking. For example, everyone's DOSPERT Social subscale score was extremely high, which makes sense on a college campus where every aspect of your life is broadcast socially. However, in a future study it would be interesting to see if the results would be different if the participant pool contained more adults, whose lives revolve more around work and family.

A final thing to note is that correlation does not equal causation. So although it can be shown that two things are correlated, that in no way means that one is the cause of the other. For example, in this study it was shown that TCU Self-Rating Form's Anxiety subscale was correlated with the average pumps taken in the BART. This does not mean that the participant's level of anxiousness caused them to perform the way they did on the BART. In the future it might be interesting to hook the participants up to something that measures their biological responses as they participate in the BART.

In sum, the hypothesis of this study was not supported because there were not many correlations found between the DOSPERT, the TCU Self-Rating Form and the BART. This could mean that they are not measuring the same types of risk-taking, which is an important discovery seeing as in the past they have been used interchangeably to measure the same construct. It would be beneficial for the scientific community to redefine, or at least narrow the construct of risk-taking and make it less generalized. Although we had a rather small participant pool, the results do help to showcase the importance of two cornerstones of science: validity and reliability.

Appendix

In the following correlation tables, the numbers represent the correlation of the two subscales that converge on that square.

Table 1.1

TCU Self-Rating Form							
DOSPERT		Self Esteem	Anxiety	Social Conformity	Decision Making Confidence	Risk-Taking	Average
	Financial	-.17	.07	.16	.07	.15	.07
	Ethical	.08	.03	-.11	-.15	.02	-.08
	Health and Safety	-.06	.20	-.07	-.31	.08	-.07
	Recreational	.20	.16	-.19	-.36	.07	-.07
	Social	.22	.10	-.20	-.08	.21	.08
	Average	.14	.17	-.13	-.31	.14	-.04

Table 1.2

TCU Self-Rating Form							
TCU Self-Rating Form		Self Esteem	Anxiety	Social Conformity	Decision Making Confidence	Risk-Taking	Average
	Self Esteem	1.0	.40	.03	-.02	.03	.40
	Anxiety	.40	1.0	.28	.10	.21	.70
	Social Conformity	.03	.28	1.0	.43	.21	.54
	Decision Making Confidence	-.02	.10	.43	1.0	.19	.59
	Risk-Taking	.03	.21	.21	.19	1.0	.50
	Average	.40	.70	.54	.59	.50	1.0

Table 1.3

DOSPERT							
		Financial	Ethical	Health and Safety	Recreational	Social	Average
DOSPERT	Financial	1.0	.11	.46	.32	.20	.58
	Ethical	.11	1.0	.43	.34	.20	.49
	Health and Safety	.46	.43	1.0	.60	.25	.80
	Recreational	.32	.34	.60	1.0	.43	.83
	Social	.20	.20	.25	.43	1.0	.55
	Average	.58	.49	.80	.83	.55	1.0

Table 1.4

TCU Self-Rating Form							
		Self Esteem	Anxiety	Social Conformity	Decision Making Confidence	Risk-Taking	Average
BART	Average Pumps Per Balloon	-.04	-.26	-.06	.03	-.06	-.20
	Total Explosions	.12	-.21	-.02	.07	-.17	-.14

Table 1.5

DOSPERT							
		Financial	Ethical	Health and Safety	Recreational	Social	Average
BART	Average Pumps Per Balloon	.12	.04	.05	-.02	.01	.03
	Total Explosions	.04	.05	.05	0	-.03	.01

Table 1.6

BART			
		Average Pumps Per Balloon	Total Explosions
BART	Average Pumps Per Balloon	1.0	.91
	Total Explosions	.91	1.0

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Brittany Lang is originally from Plover, WI. While attending college at Minnesota State University, Mankato, she was the volunteer coordinator for Psi Chi, tutored biopsychology, completed a field experience opportunity at the Leo Hoffmann Center and participated in the Honors Program for Psychology. She graduated with a B.S. in Psychology in the spring of 2011. Currently, she resides in London, England, completing an internship at Attend and is working in their Acquired Brain Injuries Unit. In the future she hopes to pursue her Master's Degree and Ph. D. in Clinical Psychology.

Mentor's Professional Biography

Dawn Albertson is originally from California. She obtained her Ph. D. in Cellular and Clinical Neurobiology from Wayne State University, School of Medicine in 2005. She is the professor for biopsychology in the Psychology Department at Minnesota State University, Mankato. She is the chair of the Undergraduate Research Conference at MSU, Mankato as well as holds a seat on their IRB. In her previous research, she utilized human postmortem brain to examine gene expression changes that resulted from the chronic administration of cocaine and heroin - two drugs of abuse that work by very different mechanisms. Her data suggest that the profiles of nucleus accumbens gene expression associated with chronic heroin or cocaine abuse are largely unique, despite what are thought to be common effects of these drugs on dopamine neurotransmission in this brain region. She is currently on sabbatical in London, England looking into reexamining the current assumptions about the commonality of molecular mechanisms associated with all abused substances. She hopes to expand her previous research beyond cocaine and heroin and into studies of methamphetamine

