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Devaluing Sex to Cope with Anxiety: A Comparative Investigation of Sexual Delay Discounting with High and Low Socially Phobic Populations

Miranda N. Bretz
Minnesota State University, Mankato

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By

Miranda N. Bretz

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Dr. Barry J. Ries, Advisor

Dr. Kristie Campana

Dr. Kathleen Foord

Abstract

Social phobia is a crippling mental disorder in which social situations are avoided or endured with intense fear (American Psychiatric Association, 2000); including, but not limited to, sexual interactions with others (Bodinger et al., 2002). Research suggests that sexual functioning disturbances are commonly present in those with social phobia (Bodinger et al., 2002; Kafka & Hennen, 2002; Kashdan et al., 2011; Mick & Hollander, 2006). Thus, it is important for the practicing clinician to be aware of the possible differences in sexual functioning in this population. The present study assessed the valuing rates of hypothetical sexual experiences in a high verse low socially anxious sample utilizing a modified delay discounting procedure. In the modified task questions assessing the perceived value of sexual activities were asked (i.e. What would you prefer?: 3 minutes of sexual activity right now or 30 minutes of sexual activity in 1 week). Those with high social anxiety were not found to significantly differ from those with low social anxiety on the hypothetical sexual activities delay discounting task. Possible research alternatives and recommendations are discussed.

Devaluing Sex to Cope with Anxiety: A Comparative Investigation of Sexual Delay Discounting with High and Low Socially Phobic Populations

Social phobia is a mental disorder in which those afflicted avoid social situations or endure such situations with intense fear (American Psychiatric Association, 2000). This social infirmity significantly influences the sexual functioning of those affected, due to the obvious element of sexual interactions being a social endeavor (Bodinger et al., 2002). The sexual functioning disturbance experienced by those with social phobia is under-researched in the psychological community and is, therefore, not well understood. Ergo, the current investigation was designed to assess the valuing rates of hypothetical sexual experiences in a population that is high, compared to low, in social anxiety by utilizing a modified delay discounting procedure.

According to the American Psychiatric Association (2000), social phobia is defined as a fear of one or more social or performance situations in which the person is exposed to unfamiliar people or to possible scrutiny by others. People with social phobia are fearful that they will act in a way that will be humiliating or embarrassing. Commonly, those with social phobia are sensitive to criticism and negative evaluation in social situations. This fear provokes distress when the person is exposed to the feared social situation; social situations are subsequently avoided or endured with intense distress. This disorder affects roughly 3-13% of the population throughout their lifetime, with onset typically occurring around the middle of adolescence. The course of this disorder is commonly recurring and it is frequently lifelong.

Social Phobia and Sexual Functioning

Due to the fear of criticism and negative evaluation in social situations, those with social phobia also experience heightened anxiety in regard to sexual experiences and, thus, exibit sexual avoidance or even some sexual dysfunctions (Bodinger et al., 2002). A disturbance in healthy sexual functioning not only leads to a reduction in positive sexual experiences, but also a disturbance in interpersonal relationship capacities. This being said, the sexual functioning of those with social phobia is not well understood. It is important for the practicing clinician to be aware of the possible differences in sexual functioning in this population to ensure open discussions about social phobia and healthy sexuality with clients.

Bodinger and colleagues (2002) compared 40 people with social phobia to 40 mentally healthy controls using a sexual functioning assessment scale. They concluded that poor sexual performance, marked avoidance of sexual activity, and changes in sexual behavior were all associated with social phobia. Furthermore, men within the experimental group reported an overall reduced enjoyment of sexual satisfaction compared to the control group. More so, women with social phobia reported less desire for sexual experiences than their non-socially phobic female counterparts. These authors recommended that clinicians be aware of the heightened risk for poor sexual functioning and satisfaction amongst people with social phobia.

Additionally, Kashdan and colleagues (2011) reported similar findings in their daily sexual episode assessment of 150 college students. Of their sample, 34 participants were found to have impairing social anxiety. The authors' findings suggest that sexual

episodes were rated as less pleasurable for the socially anxious population. Furthermore, those with high social anxiety reported feeling less connected to their sexual partners compared to those with low social anxiety. More so, the authors found that only those who were low in social anxiety reported that feelings of connectedness during sexual episodes were enhanced when in an intimate relationship. Those who were high in social anxiety did not find intimate relationships to improve pleasure or feelings of connectedness during sexual episodes.

Given the sexual difficulties experienced by people with social phobia, it is reasonable to assume that those with social phobia may experience a decrease in motivation for sexual experiences due to the fear and anxiety experienced during sexual activity. In addition to other specific sexual dysfunctions, social phobia has been linked to impulsive and compulsive sexual behavior (Mick & Hollander, 2006). Paraphilia is defined as repeated, intense sexual arousal to unconventional or socially deviant stimuli. Kafka and Hennen (2002) reported that in their sample of 120 men with paraphilia and paraphilia-related disorders, 21.6% (N = 26) had comorbid social phobia. This statistic indicates that those with social phobia may value sexual activities differently than people without social phobia.

Impulsiveness in social phobia has also been established in non-sexual assessments, utilizing a delay discounting paradigm (Rounds, Beck, & Grant, 2007). Rounds, Beck, and Grant (2007) compared individuals who rated high in social anxiety (N =54) to those who rated low in social anxiety (N = 56) in a monetary delay discounting task in a threat and non-threat condition. Essentially, delay discounting

assesses the desire for an immediate, smaller reward or a delayed, larger reward. In the non-threat condition (i.e., the control condition), those who were high in social anxiety demonstrated significantly more impulsivity and de-valuing of the monetary rewards compared to the low socially phobic group, χ^2 (1) = 6.23, $p < .01$. This study demonstrates the use of a delay discounting paradigm to illustrate impulsivity in a social phobia population.

Delay Discounting

Given the previous literature explained here, it is clear that sexual motivation and impulsivity can be atypical in people with social phobia; however, these decision making processes are not well understood in this population. Motivation and impulsivity have been assessed using the delay discounting paradigm. Delay discounting refers to the idea that the value placed on a reward is directly associated with the delay to receive said reward and it is directly connected with impulsivity (Ainslie, 1975). Those who display preference for the sooner, albeit smaller reward demonstrate a "de-valuing" of the reward and have been shown to be more impulsive than those who demonstrate self-control by preferring the postponed, larger reward.

Furthermore, research using the delay discounting paradigm has consistently shown that participants tend to devalue a larger reward as the duration to wait for the reward is extended. In other words, as the amount of the reward increases or the time of delay is altered, a participant's value of the reward also changes. This paradigm is commonly seen using monetary value (Critchfield & Kollins, 2001; Reynolds, Ortengren, Richards, & de Wit, 2006); for example, if given the choice of $1.00 right now or $50.00

tomorrow, most people would select the delayed, larger reward. However, when the amount of money is altered or the delay duration is increased, for example, $40.00 right now or $50.00 in one year, the value of the immediate, smaller reward is altered; many people may change their mind and prefer the $40 right now.

The delay discounting paradigm is well established and has been demonstrated to mark impulsivity in numerous behaviors, including: drug use (Bickel & Marsch, 2001; Bickel et al., 2007), obesity (Rasmussen, Lawyer, & Reilly, 2010; Weller, Cook, Avsar, & Cox, 2008), nicotine use (Lawyer, Schoepflin, Green, & Jenks, 2011; Locey & Dallery, 2009), gambling (Madden, Francisco, Brewer, & Stein, 2011; Madden, Petry, & Johnson, 2009), internet addiction (Saville, Gisbert, Kopp, & Telesco, 2010), and erotic material use (Lawyer, 2008). Additionally, Lawyer and colleagues (2010) found the delay discounting paradigm to also be relevant to hypothetical sexual outcomes.

Delay Discounting with Hypothetical Sexual Outcome Questions

Lawyer and colleagues (2010) utilized the delay discounting paradigm for both monetary value and hypothetical sexual activity to assess impulsive decisions in 89 college students. The authors reported that both conditions established remarkably similar discounting curves, suggesting that impulsivity regarding hypothetical sexual activity is similar to impulsivity regarding money, and both can be assessed with the delay discounting paradigm.

Due to the established delay discounting with hypothetical sexual outcomes paradigm the current investigation utilized this paradigm to assess the difference in the perceived value of sexual activity between socially anxious and non-anxious samples.

The aim of this investigation was to demonstrate the impulsivity and the valuing rates of sexual activity in a high social anxiety population compared to those who are low in social anxiety. Based on the literature previously described, it was predicted that those with high social anxiety will demonstrate an increase in impulsivity and devaluation of sexual activity in the delay discounting paradigm procedure compared to those who are low in social anxiety.

Methods

Participants

Participants were recruited from psychology courses and were granted course extra credit for their participation. To meet the high/low anxiety criteria, 412 participants first completed an online anxiety screening utilizing the social interaction anxiety scale (SIAS; Mattick & Clarke, 1998). Eighty-nine participants met the required cutoff scores on the SIAS and were invited to participate in a continuation study. Forty-four (49.4%) of participants were established to be low in social anxiety (LSA; score of 12 or below) and 45 (50.6%) were categorized as high social anxiety (HSA; scores of 34 or above) based on SIAS cutoff scores established by Heimberg, Mueller, Holt, Hope, and Liebowitz (1992). Participants in the LSA and HSA did not significantly differ on any demographic characteristic (refer to Table 1).

Sixty-six (74.2%) of the total sample were female and a majority, 85 (95.5%) reported a sexual orientation of heterosexual. The majority of participants, 86.5% (N = 77), were Caucasian, with 4.5%% reporting an ethnicity of both African American and Asian American, 1.1% reported Indian American, and 3.4% reported other. Participant's

age ranged from 18 to 50 with a mean age of 21.84 (*SD* = 5.51) and a median age of 21.00. A majority of the participants, 49.4%, reported a relationship status of single, while 34.8% reported unmarried, in a relationship, not cohabitating, 9.0% reported unmarried, living with a partner, and 6.7% were married. Thirty-six (40.4%) participants reported they did not have a religious affiliation, 23 (25.8%) reported Catholic, 18 (18.0%) Christian, 9 (10.1%) Lutheran, and 5 (5.6%) reported other. Additionally, 30.3% of participants reported they had not engaged in sexual activity within the last month, 37.1% reported engaging in sexual activity at least once a week in the last month, and 32.6% reported sexual activity more than once a week in the last month. However, desired sexual activity significantly differed from actual level of sexual activity, χ^2 (4) = 81.20, $p < .001$. Far less participants reported a preference to not engage in sexual activity in the last month (15.7%), while an ideal sexual activity rate of at least once a week (41.6%) or more than once a week (42.7%) was far more preferable to the participants.

Measures

Social Anxiety was measured using the social interaction anxiety scale (SIAS; Mattick & Clarke, 1998). The SIAS assessed individuals' perceptions of social situations. On this 20-item assessment, participants rated items on a 0 (not at all characteristic or true of me) to 4 (extremely characteristic or true of me) scale. Mattick and Clarke (1998) demonstrated strong internal consistency (α = .88-.94) and test-retest reliability (α = .92). Additionally, Mattick and Clarke (1998) established the SIAS to have strong discriminant validity between social phobia and agoraphobia (*F* (1,1064) =

5.97, $p < 0.05$), social phobia and simple phobia (F (1,1064) = 5.94, $p < 0.001$), and social phobia and normal samples (e.g., under-graduate and community samples; F (1,1064) = 296.84, $p < 0.001$). For the purposes of this study, high social anxiety was classified as those participants who receive a score of 34 and above; participants with a score of 12 or below were classified as low social anxiety. These cutoff scores have been demonstrated to reliably categorize these two groups in the social interaction anxiety scale (Heimberg, Mueller, Holt, Hope, & Liebowitz, 1992).

A demographics questionnaire was also administered, which assessed the following: gender, age, ethnicity, year in school, relationship status, and sexual orientation, as well as, current and desired level of sexual activity.

Delay discounting was assessed utilizing questions regarding monetary value and hypothetical sexual activity based on the study conducted by Lawyer and colleagues (2010). Each participant was given the option to select an immediate reward or $10, for the monetary condition, or 30 minutes for the hypothetical sexual activity condition, after five different delays. The immediate rewards ranged from $0.50 to $10.00 for the monetary condition and 2 minutes to 30 minutes in the hypothetical sexual activity condition. Monetary questions decreased in $0.50 increments, while hypothetical sexual activity questions decreased in 2 minute increments. The delay points used were based on Lawyer and colleagues' (2010) previous protocol. The five monetary delays included: 1 day, 1 week, 1 month, 6 months, 1 year. The five hypothetical sexual activity delays included: 1 day, 2 days, 1 week, 1 month, 6 months. After each choice had been made the computer program automatically adjusted to the next smaller amount of money or

minutes based on the participant's previous answer until an indifference point was established for each delay period for each participant.

The delay discounting indifference point is established when the participant elects the delayed, larger outcome over the immediate, smaller outcome (Lawyer et al., 2010). For example, a participant may be asked to select between $9 right now or $10 in one year. It is likely they will prefer $9 right now. The computer would then ask them to select between $8 right now or $10 in one year and so forth until they switch from the immediate to the $10 delayed reward. Then the computer would move on and begin asking questions about the next delay period (e.g., 6 months, 1 month, 1 week, etc.). Each participant will then have one indifference point for each of the 5 delays. Indifference points for each participant within each delay period were used to assess the discounting function, which will be discussed further in the analysis section.

Procedure

Participants first completed the online SIAS via SONA-systems. Those who met the anxiety cutoff scores were sent an email invitation to participate in a study titled, Computerized Questions Involving Money and Sexual Activity. Upon arrival at the research lab, participants were briefly introduced to the study and then asked to read and sign a consent form. Participants then completed the demographic questionnaire followed by the computerized discounting tasks. Participants were asked to perform a computerized behavioral task consisting of the delay discounting assessments for both monetary and hypothetical sexual activities. The monetary and hypothetical sexual activity tasks were counterbalanced. Participants were told the following directions for

the monetary task: “In the task that follows, you will have the opportunity to choose between different amounts of money available after different delays. The test consists of questions such as the following: (a) “Which do you prefer?: $3 right now or $10 in 1 month?.” You will not receive any of the rewards that you choose, but we want you to make your decisions as though you were really going to get the rewards you choose.”

Similarly, the participants were told the following directions for the hypothetical sexual activities task: “In the task that follows, you will have the opportunity to choose between different amounts of sexual activity available after different delays. The test consists of questions such as the following: (a) “Which do you prefer?: 3 minutes of sexual activity right now or 30 minutes of sexual activity in 1 week?.” “Sexual activity” means different things for different people, but you should answer each question in terms of whatever kind of sexual activity you personally find very appealing. You will not receive any of the rewards that you choose, but we want you to make your decisions as though you were really going to get the rewards you choose.”

Both the monetary and hypothetical sexual activity directions are from the previous study conducted by Lawyer et al. (2010). Once participants completed both delay discounting tasks they were informed of the study’s purpose and thanked for their participation.

Analysis

It is first necessary to identify nonsystematic responding which can occur due to carelessness of the participant, such as random responses, or invariance in responding, in which the indifference points do not change along with the delay periods. Regardless of

how they occur, nonsystematic responses were selected and removed using two formulas based on Johnson and Bickel's (2008) recommendation. Responses were considered nonsystematic if any one indifference point is greater than the preceding indifference point by more than 20% (e.g., $2 or 6 minutes or if the last indifference point was not less than the first by at least 10% (e.g., $1 or 3 minutes).

Once nonsystematic responders were removed, an estimation of the discounting parameters was established utilizing the hyperbolic decay model as described by Mazur (1987): $Y=A(1+kD)$. In this model Y is the present value of the delayed reward, A is the amount of the larger outcome (in this case $10 or 30 minutes), D is the duration of the delay, and *k* is the discounting rate that is sought out in the equation; therefore, in this equation I solved for *K*. Each participant's indifference point data was fit into the hyperbolic equation using a nonlinear regression procedure in SPSS generating a *k* value for each participant in both the monetary and hypothetical sexual activity conditions. The *k* values for each condition were then compared using the Kruskal-Wallis Median test. The Kruskal-Wallis Median test was appropriate because it utilizes rank ordering and *k* values are rank orders. In this analysis, a larger k value indicates a steeper discounting rate, or more impulsive decision making. In other words, the larger the *k* value, the more a person values the immediate, smaller reward, demonstrating impulsivity.

Results

Systematic and nonsystematic response patterns

The monetary delay discounting task resulted in 13 (14.8%) nonsystematic responders and the hypothetical sexual activity delay discounting task resulted in 28

(31.5%) nonsystematic responders. McNemar's χ^2-test was utilized to demonstrate significantly more nonsystematic responders in the hypothetical sexual activity task than the monetary task ($p < .05$). Table 2 demonstrates the frequency breakdown of the nonsystematic responders within each discounting task. The number of nonsystematic responders did not significantly differ between the LSA and HSA conditions.

Hypothetical sexual activity delay discounting between anxiety groups

Kruskal-Wallis Median test did not find a significant difference in hypothetical sexual activity *k* values between the LSA (N = 32) and HSA (N = 29), χ^2 (1) = .79, *p* = *n.s*. Figure 1 demonstrates the percent of *k* values greater than the median.

Monetary delay discounting between anxiety groups

Similarly to the hypothetical sexual activity condition, the Kruskal-Wallis Median test did not find a significant difference in monetary *k* values between the LSA (N = 36) and HSA (N = 39), χ^2 (1) = 3.29, *p* = *n.s*. Figure 1 demonstrates the percent of *k* values that are greater than the median.

Discussion

The purpose of the present study was to determine if those who are high in social anxiety will demonstrate an increase in impulsivity and devaluation of sexual activity in the delay discounting paradigm procedure compared to those who are low in social anxiety. Contrary to expectation, social anxiety levels did not affect valuing rates of hypothetical sexual activity or monetary value in the delay discounting paradigm. These findings suggest that social anxiety may not be associated with perceived value of delayed reward as concluded by Rounds, Beck, and Grant (2007). However, Rounds,

Beck, and Grant (2007) did not assess for and remove nonsystematic responders from their analysis, likely including a small percentage of such responses, which could explain their result of a differing monetary delay discounting values in their high and low socially anxious populations.

Furthermore, this study found there to be significantly more nonsystematic responders in the hypothetical sexual activity delay discounting task compared to the monetary delay discounting task; a discrepancy that was not found in previous comparisons (Lawyer et al., 2010). The inconsistency in systematic responders is possibly one reason an effect for social anxiety was not found among hypothetical sexual activity discounting values, as nonsystematic responders indicate participants who may have been careless or random in their responding.

One finding of note is that actual sexual activity engaged in in the last month was significantly less, overall, than desired level of sexual activity in the last month, χ^2 (4) = 81.20, $p < .001$; however, an effect for social anxiety was not found within this outcome. This finding demonstrates that those in the college sample reported desiring more sexual activity than they were currently attaining. Although social anxiety was not found to influence current sexual activity, those who were low in social anxiety were more likely to have engaged in sexual activity in the last month at a level that was approaching significance, χ^2 (2) = 5.81, $p = .055$ (refer to Table 1 for statistics). Indicating that, future research may be able to demonstrate that those who are high in social anxiety are more likely to not have had sexual activity in the last month and less likely to have engaged in sexual activity more than once a week in the last month.

There were several limitations relating to this investigation; most notably, the large number, 31.5%, of nonsystematic responders in the hypothetical sexual activity delay discounting task. The number of nonsystematic responders could point to a lack of clear task directions or possible participant confusion.

Additionally, since the hypothetical sexual activity delay discounting had more than twice the nonsystematic responders than the monetary delay discounting task it is likely the participants did not view minutes of sexual activity as an objective system in which to place a value in the same way they place value on money. Finally, this delay discounting task assessed value rates for quantity of hypothetical sexual activity, which may be confounded by a desire for better quality, not quantity of sexual activity. Delay discounting has predominantly been utilized to assess primary reinforcers; it is possible that minutes of sexual activity is not reinforcing enough to be utilized in a delay discounting paradigm.

Future research should explore in depth the use hypothetical sexual activity, in minutes, as a method for assessing valuing rates and impulsivity. More research is needed using non-tangible goods, such as sexual activity, in the delay discounting task. Additionally, other measures of impulsivity may better answer the question of whether or not those with high social anxiety are more impulsive in their sexual actions. Moreover, this sample was very homogeneous in age and ethnicity; a more diverse sample may provide a better representation of the population, thus increasing external validity of this study. Finally, because the delay discounting paradigm utilized non-parametric statistics

due to skewed data, a larger sample size may prove to demonstrate an effect, as the small sample size is certainly a limitation in this study.

In conclusion, this report suggest that there may not be a difference in the valuing rate of hypothetical sexual activity in a high, compared to low, socially anxious population; however, more research is needed to address the possible differences in sexual functioning within this population.

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Table 1
Demographic characteristics in HSA and LSA groups

Demographics	Low Anxiety	High Anxiety	df	χ^2	*p*
Gender			1	0.09	n.s.
Male	12	11			
Female	32	34			
Ethnicity			4	8.00	n.s.
Caucasian	38	39			
African American	4	0			
Asian American	2	2			
Indian American	0	1			
Other	0	3			
Sexual Orientation			2	1.33	n.s.
Heterosexual	42	43			
Bisexual	2	1			
Homosexual	0	1			
Relationship Status			3	1.76	n.s.
Married	4	2			
Unmarried, living with a partner	4	4			
Unmarried, in a relationship, not cohabitating	17	14			
Single, not in a relationship	19	25			
Religious Affiliation			4	5.72	n.s.
None	13	23			
Catholic	13	10			
Lutheran	4	5			
Christian	11	5			
Other	3	2			
Sexual Activity in the Past Month			2	5.81	n.s
None	9	18			
At least once a week	16	17			
More than once a week	19	10			
Preferred Sexual Activity for the Past Month			2	1.58	n.s.
None	5	9			
At least once a week	18	19			
More than once a week	21	17			

Table 2
Nonsystematic responders by algorithm type

	Algorithm			
Delay Discounting Task	1	2	Both	Either
Monetary	6	9	2	13
Hypothetical Sexual Activity	18	17	7	28

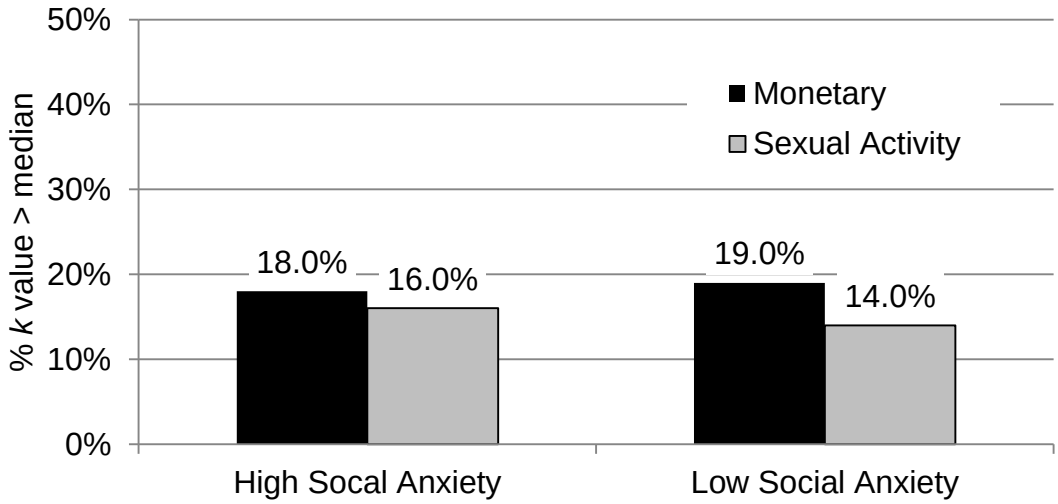

Figure 1. *Result of median test for HSA and LSA groups within the monetary and hypothetical sexual activity delay discounting conditions. Plotted values are above the median k-value.*