

The Effect Of Sexualized Advertisements On Delayed Discounting

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ABSTRACT

The Effect of Sexualized Advertising on Delayed Discounting

Austin James Trudeau

This research builds upon the literature on the effects of sexualized advertising and seeks to examine its impact on consumers' delayed discounting. More specifically, this research examines to what extent arousal induced by sexualized advertisements as well as consumers' trait impulsivity influence consumers' tendency to discount financial rewards. In a computer-based lab experiment, 263 participants were randomly assigned to sexualized advertisement exposure or exposure to neutral images (control) and completed a financial discounting task. The financial discounting task included two monetary rewards amounts (\$1,000 and \$25,000) across six different time delays (1 day, 1 week, 1 month, 6 months, 1 year, and 5 years) and interest rates (.000 to 1.000 in .025 and .050 increments). Trait impulsivity was a measured variable. In the context of discounting of financial rewards, this research found no significant relationship between sexualized advertising induced arousal or trait impulsivity, and delayed discounting. The results have implications for future investigations of the influence of consumers' affective states on decision-making.

Keywords: Delayed Discounting, Affect, Arousal, Valence, Impulsivity, Financial Rewards, Financial Decision-Making

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Table Of Contents

List Of Tables	vvi
List Of Figures	VII
Introduction.....	1
Theoretical Background.....	4
DELAYED DISCOUNTING	4
ADVERTISING AND DELAYED DISCOUNTING	8
AFFECT	9
TRAIT IMPULSIVITY	12
Method	14
RESEARCH DESIGN	14
STIMULI	14
MEASURES.....	16
Self-Assessment Manikin (SAM).....	16
Discounting Paradigm.....	16
Behavioural Inhibition System/Behavioural Activation System (BIS/BAS)	16
PARTICIPANTS.....	16
PROCEDURE	17
Results.....	17
DATA SCREENING AND EXCLUSIONS.....	17
MANIPULATION CHECKS.....	18
Arousal.....	18
Valence	20
HYPOTHESIS TESTS	22
Discussion.....	24
References.....	31
EXAMPLES OF BINARY CHOICE TASKS IN DELAYED DISCOUNTING PARADIGM	37
Appendix B.....	39
IAPS CODING SHEET (AROUSAL & VALENCE).....	39
Appendix C	40
BARRATT TRAIT IMPULSIVITY SCALE	40

LIST OF TABLES

Table 1	15
Table 2	19
Table 3	20
Table 4	21
Table 5	22

LIST OF FIGURES

Figure 1	19
Figure 2	21
Figure 3	23

THE EFFECT OF SEXUALIZED ADVERTISEMENTS ON DELAYED DISCOUNTING

INTRODUCTION

Decisions imply the presence of some form of choice. Choice options may differ from each other in various ways, such as in terms of value, quality, outcome certainty, and time delay. Consumers frequently encounter choice options that vary as a function of time. Moreover, making decisions often involves a trade-off between objective value (i.e., fact, agreed upon market value, not influenced by feelings) and subjective value (i.e., taste, feelings, opinions; (Estle, Green, Myerson, & Holt, 2006; Vrana, Spence, & Lang, 1988). For example, ordering from Restaurant A may result in a 20-minute delivery time, while choosing Restaurant B may result in a 45-minute delivery time. When presented with a situation like this, consumers may ask themselves whether the perceived benefit of ordering a preferred meal from Restaurant B *outweighs* the increased wait time? In other words, does the subjective value of the reward compensate for the time delay? Although, real-life decision-making is rarely that simple, there are often situational variables that influence decision-making style and motivations – such as the presence of sexual arousal. Tracing back to the original example, what if consumers associate a brand with excitement due to its use of highly sexualized advertisements displaying semi-nude models? Does sexualized advertising induce higher levels of arousal that then affect consumers' tendency to seek a reward sooner?

The paradigm of delayed discounting captures this phenomenon. In manipulating two variables, namely time delay and size of reward (often operationalized in terms of its monetary value), researchers and practitioners have begun to explore the mechanisms underlying consumers' decision-making. However, to better understand the subjective value of a reward, individual-level antecedents, such as state arousal and trait impulsivity, should be taken into

account. Previously, variables such as sexuality, impulsivity levels, and states of satiety have been shown to have an impact on discounting in a variety of domains (Hofmann, Friese, & Strack, 2009; Johnson et al., 2020; Skrynka & Vincent, 2019). However, findings with factors that influence discounting rates have been mixed. Against this backdrop, the current research examines whether sexualized advertising cues influence consumers' tendency to discount due to emotional arousal, and whether trait impulsivity has an incremental impact.

Sexualized advertising is defined as advertising aimed eliciting sexual associations that are then transferred to a product or brand (Reichert & Lambiase, 2003). Surprisingly, empirical research on the intersection of sexualized advertising and its subsequent impact on consumer behavior is scarce, and rare attempts at examining the impact of sexual arousal and affect in relation to decision making reveal mixed results (Gómez-Miñambres & Schniter, 2017; Hirsh, Guindon, Morisano, & Peterson, 2010). To shed more light on the impact and effectiveness of sexualized advertisements, the current research explores the following questions: First, do sexualized advertisements elicit arousal and therefore impact consumers' financial decision-making in the context of rewards in a delayed discounting paradigm? Second, does trait impulsivity play a contributing role?

In efforts to market their products more boldly, firms often use models in their advertisements, such as celebrities and professional athletes – of which, many are sexualized. Including nudity and provocative poses, these ads are designed with two goals in mind: attention and aspirational value. While the former is aimed at drawing consumers' attention to the ad, the latter suggests that by using the product or brand, consumers increase their attractiveness (M. Bradley & Lang, 2006; Gramazio, Cadinu, Guizzo, & Carnaghi, 2021). The current study

explores whether there is an alternative consequence of sexualized advertising, namely the induction of a state of arousal to increase impulsivity in consumers' decision-making.

Although the Canadian advertising market saw \$11 billion dollars in revenue in 2019, and despite the wide use of sexualized advertisements, there is surprisingly little evidence for how these ads influence consumers' decision-making. Thus, does Justin Bieber posing in Calvin Klein underwear or a sultry Taylor Swift sipping a bottle of Coca-Cola noticeably impact consumers' desire for an immediate reward through consumption? Can sexualized ads influence consumer behavior in an unrelated domain, such as financial discounting behavior?

In the age of the digital marketer and e-commerce tracking metrics (i.e., cost-per-click, search engine optimization, consumer mouse tracking/heat maps), there is a surprisingly large absence of empirical research on this topic. Not only are there no validated metrics to capture consumers' behavioral responses to sexualized ad exposure, there is very little literature exploring the relationship between the two. Extant research does not establish a link between sexualized ads and financial decision-making, and most research on the impact of sexualized ads relies on self-reports of purchase intention and production attractiveness (Gramazio et al., 2021; Reichert & Lambiase, 2003). The current study therefore aims to close the conceptual and methodological gaps in the literature by examining whether sexualized ads influence consumers' decision-making in the context of a financial rewards discounting framework that directly measures consumers' choices across reward magnitudes, timeframes, and discounting rates. In doing so, this research contributes to the literature on advertising as well as delayed discounting.

THEORETICAL BACKGROUND

Delayed Discounting

Delayed discounting captures the phenomenon which states a reward (or cost) is perceived differently as a function of its temporal distance (McKerchar, Pickford, & Robertson, 2013). For example, immediate rewards presented in contrast to a delayed but larger reward, may be chosen due to the immediacy of consumption, even though the amount is inferior. In delayed discounting, objective and subjective evaluations interact to yield a measure of one's tendency to discount costs or rewards (Estle et al., 2006; Vincent, 2016). The intersection of objective and subjective value occurs when delayed discounting is able to yield a measurement of *psychological value*, which is unique to the individual (McKerchar et al., 2013). More notably, after observing many decisions over time, one's discounting function can determine the point at which one is indifferent to an immediate smaller reward versus a delayed, but larger reward. An indifference point reflects the point in time at which an individual is indifferent to either option, implying symmetry of subjective psychological value between the two choices (Odum & Rainaud, 2003). This allows for the calculation of an individual's discounting curve (i.e., discounting function), otherwise known as the predictive formula of how one would behave in the presence of similar parameters. While the logarithmic mathematical modelling behind delayed discounting can begin to model an individual's decision-making, this model varies considerably from one individual to another (Boettiger et al., 2007).

One key distinction to address is that of temporal discounting versus probabilistic discounting. While the former measures one's subjective value of a reward by observing how individuals act when the reward is delayed in time, the latter measures choice preference as a function of how likely one is to receive the reward (Augustine & Larsen, 2011; Lawyer,

Williams, Prihodova, Rollins, & Lester, 2010). In temporal discounting, there is no risk of not receiving the chosen reward, but individuals are asked to choose a smaller reward *now*, or a larger reward *later*. While the consumption of some products and services (e.g., life insurance, car insurance) is probabilistic, the temporal discounting model applies to most products and services offered at varying prices. For example, consumers face the choice of acquiring a new product, such as seasonal apparel or a new car model, immediately after its release or wait until it is offered at a more rewarding, lower price point at the end of the season or model year.

In the temporal discounting literature, hyperbolic models have been found to accurately capture individuals' responses in order to generate an individualized predictive model of their behaviour (Coker, Pillai, & Balasubramanian, 2010; Myerson & Green, 1995). This is primarily because of an individual's lack of ability to base their decisions on a consistent exponential function of how the time parameter varies. As a result, a hyperbolic model performs better than an exponential model in its ability to accurately depict individuals' decisions (Kirby & Maraković, 1995; McKerchar et al., 2013). In other words, hyperbolic models are accurate in capturing inconsistent choices compared to the exponential model, given that choices in a delayed discounting paradigm are often inconsistent (Kirby & Herrnstein, 1995).

Studies focusing on temporal discounting (e.g., McKerchar et al., 2013) have been able to exemplify how individuals view the discounting of costs and rewards differently as a function of time delay. However, when probabilities of receiving the reward or incurring the cost are introduced, the focal point shifts from value of the reward to odds strategies (Estle et al., 2006). From a marketing standpoint, the argument can be made that gaining insight into how rewards are valued is generally more applicable than understanding decision-making strategies maximizing positive outcome around probabilities.

Within the delayed discounting framework, two issues require further discussion: First, the domains delayed discounting paradigms relate to, and secondly, the influence of individual differences in terms of psychological traits on one's tendency to discount. Delayed discounting applies to a variety of decision-making domains, including finances, health, the environment, personal relationships, and it has implications for climate change behaviour, financial planning, physical and mental health, business management, and marketing (Amlung et al., 2019; M. M. Bradley, Hamby, Löw, & Lang, 2007; McKerchar et al., 2013; Stephan & Müller-Fürstenberger Georg, 1998; Yoo & MacInnis, 2005).

Given the majority of delayed discounting studies have focused primarily on dependent variables in the realm of financial, sexual, and health (i.e., food and satiety) behaviours, and given that many have failed to account for individual differences in self-control and impulsivity, the case for the current investigation of monetary discounting is justified (Amlung et al., 2019; Smith, Lawyer, & Swift, 2018). Moreover, the question of domain-specificity arises: is delayed discounting bound to certain domains of decision-making but not others? Is there a domain that results in more discounting (choice of the immediate reward) than others (McKerchar et al., 2013; Skrynka & Vincent, 2019)? By starting with the group and environmental cost observations, then zoning in on the individual and financial cost and reward observations, the need for the current investigation for delayed discounting of financial rewards as a function of sexual ad exposure becomes increasingly evident.

For example, the financial costs associated with implementing green energy are incurred immediately by the current federal administration, while the benefits of reducing greenhouse gas emissions are only incurred in the distant future, experienced most prominently by the next generation (Stephen & Müller-Fürstenberger, 1998). This example is currently an international

challenge, and yet delayed discounting appears to be a viable theory to explain collective inaction. Observing how behaviour is modified as a result of subjective versus objective value, and how that varies as a function of time, justifies further investigation into how these factors influence consumers' decision-making. This may be the only domain where the impacts of discounting and taking the immediate reward (of mass production valued over long-term environmental sustainability) can impact the next generation more than it impacts the current. The temporal distance of impact here is possibly the largest in delayed discounting research. While the argument could be made that with the actions made today, we are gambling with the next generation's environmental conditions, there are domains that exemplify the opposite, whereby choosing the immediate reward can impact life-course dramatically, for example, financial gambling.

Delayed discounting has been shown to be predicted by pathological gambling via their impulsive nature when it comes to monetary rewards (Alessi & Petry, 2003). This is relevant to consumer behaviour in the retail or digital marketplace because discounting occurs in the same domain (i.e., money). Research on how pathological gambling impacts delayed discounting, pushes the boundary of what is considered domain-specific (Lawyer & Mahoney, 2018). It has been shown that delayed discounting behaviour can differ across domains for individuals (i.e., discounting behaviour regarding monetary rewards, monetary costs, environmental costs, or health costs), whereas for individuals, self-control or impulsivity can change across domains (Lawyer & Mahoney, 2018).

In addition, delayed discounting is associated with psychiatric conditions. Evidence from a meta-analysis of delayed discounting suggests transdiagnostic properties of one's decision-making propensity (Amlung et al., 2019). For example, bipolar disorder and major depressive

disorders are associated with steeper discounting (i.e., choosing immediate rewards), while anorexia nervosa was associated with delaying gratification (Amlung et al., 2019).

In a consumption context, delayed discounting can have important implications for consumers' well-being. Regarding financial discounting, for example, higher discounting rates for credit card or repayment plans will result in the delay of full payment and entail the accumulation of interest payments. To shed more light on factors influencing consumer decisions in this context, this research examines to what extent arousal elicited by advertisements influence consumers' delayed discounting.

Advertising and Delayed Discounting

In investigating the field of research of delayed discounting, several findings are discussed to establish what this paradigm encompasses, and what it does not. Given that the current study is investigating financial decision-making within a delayed discounting paradigm, it is necessary to explore the previous findings in this domain, although limited. The research of McKerchar et al. (2013) exemplified a significant change occurs in one's subjective value (i.e., perceived value of a cost (\$), given a time delay). While replicating the expected results of gains being discounted more than losses, researchers were able to differentiate between the discounting of two amounts: \$1,000 and \$25,000. For example, for the \$1,000 reward condition, the choice could be between receiving \$1,000 today or \$1,250 in six months. For the \$25,000 condition, it could be between receiving \$25,000 today or \$31,250 in six months. Both scenarios have an interest rate of 25% over a six-month period. In line with financial gains being discounted more than losses, the \$25,000 reward was discounted less (valued more) than the \$1,000 reward. This indicates a higher reward was perceived as more valuable, even across seven different time delays. However, if a state of arousal is evoked at the time of decision-making, will consumers'

decisions change? Is consumers' choice impacted as a function of being exposed to a sexualized ad? Given that delayed discounting captures how individuals weigh the subjective value of a reward as a function of time (da Matta et al., 2012; Kirby & Herrnstein, 1995), do sexualized advertisements lead to a greater tendency to seek immediate rewards? While most consumers may not be aware of psychological and physiological responses to sexualized advertisements, they nonetheless impact decision-making mechanisms (Gómez-Miñambres et al., 2017).

Affect

Imagine a retirement and financial planning advisor who has a very strong personal financial portfolio, but is prone to overeating, which negatively impacts his health. How can one person be disciplined in one domain and seemingly lack discipline in another domain, with both being equally important for a high quality of life? Researchers suggest this comes down to an interaction between inter-individual difference (e.g., situational factors) and intra-individual differences (e.g., impulsivity vs. self-control) (Gómez-Miñambres & Schniter, 2017). While intrinsically attributed value plays a large role in determining the amount of influence that each source holds, this model explains why an individual who is risk-averse in a financial sense, can also be risk-seeking from a health perspective. As intra-individual factors are used as a source of motivation in saving money, the overweight financial advisor's eating habits are clearly rooted in intra-individual factors as well (i.e., lack of self-control and domain-specific impulsivity), the difference in application can be due to inter-individual factors (situational). This suggests a domain-specific score for delayed discounting across individuals (Gómez-Miñambres & Schniter, 2017). Thus, not only does decision-making differ from person to person, when applying delayed discounting, it differs across domains as well. However, the discussion of

situational factors and what forms they can take currently ends there (Gómez-Miñambres & Schniter, 2017).

The presence of affect can sway the mechanisms used to make a decision (Bradley & Lang, 2006). Affect is defined by Merriam-Webster as the presence and/or production of an emotional (affective) response (in someone) and is explored in a plethora of academic empirical research today. Two of the most frequently used measures of affect consist of arousal and valence. In order to gauge affect elicited by a stimulus, arousal and valence are often scored using measures like the self-assessment manikin (SAM), a self-report visual indicator of one's level of arousal and valence (Bradley & Lang, 1994). Arousal, in particular, has been shown to evoke responses, such as brain activation and galvanic skin response to pupil dilation (Bradley & Lang, 2006). While research on emotion has shown that affect impacts the medial prefrontal cortex, delayed discounting research has shown that the weighing of a now versus later type of decision utilizes the dorsolateral prefrontal cortex (Bradley & Lang, 2006; Wang et al., 2017). Yet, despite the neural topographic proximity, the impact of emotions, in particular arousal, on financial decision-making, remains vastly unexplored.

While a surfeit of research has linked judgment and decision-making deviations to the presence of affect, few have provided an explanative model for how this manifests in delayed discounting. However, there are notable parallels which allow for the formulation of directional hypotheses. It was found that during choice tasks, affect can be used as a feedback mechanism for the individual (Clore & Huntsinger, 2007). That is, when induced into a positive affective state, one can easily confuse this state for positive feedback of their thoughts and inclinations (Clore & Huntsinger, 2007). A direct impact of this mechanism being at play is the subsequent differential analysis of risk. In the context of a delayed discounting paradigm question, when

presented with a binary choice task of \$1000 today or \$1300 in six months while viewing a sexualized advertisement, it is therefore likely that arousal in response to a sexualized advertisement predisposes consumers to the choice of an immediate reward.

In measuring visual attention to the advertisement, researchers investigate the role of emotion in the equation of competing for consumers' attention. While cognitive and animation effects of the advertisement also held significant weights, emotion was shown to be a prominent precursor for the amount of attention one will give to an ad (Yoo & MacInnis, 2005). However, an inverted-U finding was observed, whereby too much emotion could possibly deter the consumer from looking further into the advertisement or the brand/product/service being marketed.

This is an influential finding with regards to its possible implications on sexualized advertising. While some research has shown that sex does in fact not sell, and in some cases, actually deters the consumer, other research has shown that sexualized ads can lead to significantly better recall ability in males specifically (Gramazio et al., 2021; Taylor, Rapp, & Brunye, 2007). American Apparel's nipple de-stigmatization campaign received a lot of pushback from consumers, which challenged the commonly used "there is no such thing as bad advertising" narrative. However, when it comes to measuring financial behaviour as an outcome variable, do these results hold? Delving into a more empirical approach, one can begin to answer the question; does sex *really* sell?

In an attempt to disentangle personality from affective states, researchers measure how a positive state interaction with one's extraversion trait score can influence one's delayed discounting tendencies (Hirsh et al., 2010). Successfully solving a puzzle after having watched a confederate struggle and fail to solve it resulted in a higher tendency to discounting in a financial

delayed discounting binary choice task. While this effect was amplified by one's extraversion trait score, the positive emotional state was seen as the more influential variable. In the condition where participants were beaten out by confederates in solving the puzzle, there was no amount of extraversion that was able to cause them to discount and choose the immediate smaller reward over the future larger reward. The aim of the current study is to investigate whether an affective stimulus (i.e., arousing sexualized advertisement) presented prior to a binary-choice delayed discounting task will yield a differential delayed discounting rate. Based on the previous literature, it is hypothesized:

H1: Exposure to a sexualized advertisements will yield a higher (steeper) discounting rate.

Trait Impulsivity

Two of the most influential variables influencing discounting are state and trait self-control, and impulsivity (Foxall, 2010). Many studies have investigated their long and short-term impacts in evolutionary psychology, neuroeconomics, and cognitive psychology (i.e., reinforced learning) (Amos, Holmes, & Keneson, 2014; Smith et al., 2018). Framed as the most instrumental antecedents in the realm of discounting behaviour, they represent psychological variables that consumers bring to financial decision-making (Alessi & Petry, 2003). While the relative impact of state or trait self-control and impulsivity has not been empirically determined to date, their impact on discounting is well established (Alessi & Petry, 2003; Hofmann et al., 2009; McClure, Ericson, Laibson, Loewenstein, & Cohen, 2007).

Self-control can be thought of as the top-down regulatory system, and is a part of the executive control family of functions (Bari & Robbins, 2013). In the context of delayed discounting, self-control would be the underlying mechanism that would influence the ability to

inhibit choice of short-term rewards in favor of larger rewards in the long-term. Impulsivity, on the other hand, is the failure to execute inhibitive behaviour that has domain-specific triggers (Bari & Robbins, 2013; Hofmann et al., 2009). When the regulatory cognitive system of self-control is impaired or absent, impulsivity becomes much more prevalent. In neurotypical and non-addict populations, neuroimaging studies have shown the activation in different brain areas during a delayed discounting task when it comes to measuring self-control and impulsivity (Boettiger et al., 2007; Li et al., 2009). In addition, further research has found that impulsivity is associated with affective state (Muraven & Baumeister, 2000). Findings regarding self-control and impulsivity thus suggest that trait impulsivity has a significant impact on delayed discounting behavior related to rewards.

H2: Individuals who are high (vs. low) in trait impulsivity will discount more in a financial discounting task.

To summarize, this research examines whether sexualized advertisements as an affective (i.e., arousing) prime, influences consumers' delayed discounting in a financial context and considers the contributing role of trait impulsivity.

METHOD

Research Design

This research used a one-factor (sexualized advertisements) control between-participant experimental design in order to reduce study length and preclude participant fatigue. In a computer-based lab study, participants were presented with sexualized advertisements or neutral images (control condition), followed by a delayed discounting paradigm (i.e., a series of binary choice tasks; Appendix A). Participants also completed a questionnaire with individual difference (i.e., trait impulsivity) and demographic variables.

Stimuli

International Affective Picture System. To induce a neutral affective state in the control condition, the International Affective Picture System (IAPS, 2004) was used. The IAPS is a database of validated images that have been objectively rated for arousal (i.e., state of active excitability) and valence (i.e., intrinsic pleasantness or unpleasantness). Using the IAPS ratings on these two dimensions, a set of neutral (i.e., neutral valence, low arousal) images was identified for inclusion in this study (Appendix B).

Validated Sexualized Advertisements. In a pretest ($N = 368$, 33.42% male, 64.67% female, 0.01% non-binary, $\bar{x}_{Age} = 21.60$, $Range_{Age} = 18 - 44$ years old) involved a large sample of sexualized advertisements sourced from commonly known clothing companies (e.g., American Eagle, Aeries, American Apparel, Aritzia). Pretest participants recruited through the Psychology and Marketing participant pools completed an online questionnaire. After completing demographic variables and control measures related to sexual orientation and attitudes toward sexual behaviors, participants saw a series of sexualized advertisements (operationalized as showing more than 90% nudity) featuring either male or female models (74%

female, 26% male) alone, together, or in a group. For each advertisement, participants completed a Self-Assessment Manikin (SAM) measuring arousal and valence, as well as measures of brand and ad familiarity, and perception of the model(s) shown in the advertisement. Of the advertisements included in the pretest, 25 advertisements were rated high in arousal ($M = 3.98$, $SD = 2.43$) and positive in valence ($M = 5.19$, $SD = 2.06$), and were this chosen to be used in the subsequent discounting study. This cluster of advertisements was generally low in brand familiarity ($M = 5.72$, $SD = 1.42$), yet high in ad familiarity ($M = 3.82$, $SD = 2.07$) relative to the total images being scored. Individual ratings are summarized in Table 1.

ID	N	M - Arousal	M - Valence	M - BF	M - AF	SD - Arousal	SD - Valence	SD - BF	SD - AF
K225	32	4.25	5.53	5.91	5.31	2.76	2.37	1.51	1.91
K4	26	4.31	5.42	6.08	5.04	2.56	2.45	1.09	1.99
K14	26	4.42	5.46	6.04	4.73	2.28	2.06	1.00	2.29
K20	26	4.12	5.08	6.19	4.65	2.63	2.12	0.90	2.35
U233	20	1.90	4.65	5.40	4.55	1.74	1.98	2.33	2.28
K236	32	4.44	5.47	5.91	4.13	2.71	2.21	1.40	2.08
K278	24	4.96	5.42	5.54	3.88	2.58	2.47	1.59	2.09
K260	24	4.38	5.75	5.71	3.88	2.34	2.25	1.63	2.13
U29	24	4.88	5.96	6.42	3.75	2.03	1.73	0.72	2.23
U224	20	2.05	4.45	5.65	3.75	1.67	2.01	2.16	2.49
U251	23	3.83	4.96	5.13	3.70	2.79	2.48	1.98	1.92
U119	28	4.18	5.18	5.96	3.68	2.82	2.21	1.10	1.94
U99	28	4.32	5.04	5.93	3.64	2.68	2.27	1.36	1.99
U84	28	3.68	4.75	5.86	3.64	2.23	1.84	1.24	1.97
K206	22	2.82	4.64	5.68	3.59	2.22	2.84	1.36	2.30
U190	28	4.32	5.39	4.82	3.50	2.55	2.08	2.04	1.97
U85	21	4.57	5.19	6.33	3.48	2.44	1.66	0.66	2.16
K252	26	4.04	5.46	5.69	3.46	2.51	1.70	1.54	1.90
K74	26	4.23	5.81	5.19	3.42	2.89	1.98	1.72	1.81
U140	28	3.04	3.61	5.96	3.32	2.22	1.71	1.20	1.89
K123	26	4.15	6.12	5.73	3.31	2.80	1.80	1.46	2.04
K283	26	3.65	5.04	4.69	3.31	2.26	2.01	2.17	2.02
U113	21	5.14	5.67	6.38	3.29	2.43	1.46	0.59	2.10
U146	28	3.93	4.61	4.71	3.29	2.28	1.95	2.03	2.02
U89	21	3.86	5.00	6.24	3.29	2.41	1.79	0.83	1.90

Table 1. Means and standard deviations of each sexualized advertisement scored on arousal, valence, brand familiarity (BF), and ad familiarity (AF).

Measures

Self-Assessment Manikin (SAM). To measure the effectiveness of the arousal manipulation through sexualized advertisements, participants completed the 7-point Self-Assessment Manikin (SAM) prior and post exposure to the stimuli. The SAM is a validated screening procedure used to assess dimensional affect (through quantifying valence and arousal) by using a pictographic scale to evaluate varying stimuli (Bradley & Lang, 2006). This measure allowed for a comparison of valence and arousal ratings prior to (baseline) and post-exposure to the images presented in each condition.

Discounting Paradigm. This research integrated two previously validated methods to yield a hybrid discounting paradigm that is both robust and randomized. Interest rate increases were calculated using the following intervals (.010 to 1.000, in .025 and .050 increments), as a function of increases in the delayed choice (1 day, 1 week, 1 month, 6 months, 1 year, 5 years, 25 years) (McKerchar, Pickford, & Robertson, 2013). In addition, a randomized presentation of binary reward choices was implemented into the delayed discounting model.

Behavioural Inhibition System/Behavioural Activation System (BIS/BAS). Trait impulsivity was captured by the BIS/BAS measure administered at the end of the study (Appendix C).

Participants

Participants consisted of undergraduate students in the psychology and marketing departments attending Concordia University. Participants were recruited from the Psychology and John Molson School of Business Participant Pools in exchange for partial course credit.

Procedure

After reading the consent form and agreeing to take part in the study, participants were given definitions for terms used in questions throughout the study (i.e., high vs. low arousal, positive vs. negative valence). At this point in the study, the randomized assignment function in Qualtrics was used to assign participants to either the neutral or sexualized ad condition. After completing their first self-assessment manikin (baseline SAM), participants were shown either 25 neutral photos or 25 validated sexualized ads for three seconds each. Participants then completed the SAM for a second time, as a measure of post-exposure arousal and valence, and proceeded with the delayed discounting binary choice task. In this task, they indicated which reward they would rather have using validated interest rate amounts (McKerchar, Pickford, & Robertson, 2013). There were 150 binary choices, accounting for each dollar amount counterbalanced across each time delay (McKerchar et al., 2013). Participants then completed a third SAM measure, followed by the BIS/BAS scale and demographic questions (i.e., university faculty, age, country of origin, languages spoken, sexual orientation, gender identification). Participants were debriefed online and thanked for their participation.

RESULTS

Data Screening and Exclusions

Of the 423 students who participated in the online study, 316 completed the study. For the 316 remaining participants, the Ebert and Prelec Discounting Model was the decision-making model which best fit to the collected data (Ebert & Prelec, 2007). This left 56 participants' responses that did not fit the model (i.e., their choices were inconsistent), resulting in their data being excluded. Fitting all discounting curves to a model is a critical step prior to analyses to ensure that discounting functions can be compared while maintaining internal reliability. The

final data analysis is thus based on data from 263 participants ($N = 263$; 141 were male (57.03%), 122 female (46.39%); $range_{Age} = 18 - 44$ years old).

Manipulation Checks

Arousal. The manipulation check for arousal using the self-assessment manikin (SAM) of sexualized ads (vs. control) revealed a partially successful manipulation of arousal in the sexualized advertisement versus neutral (control) condition. However, the assumption of sphericity was violated (*Mauchly's* $W = .957, p = .003$), therefore the Greenhouse – Geisser correction was applied to the one-way repeated measures ANOVA. A significant effect ($F(1.917, 500.419) = 8.215, p < .001$) was observed within a condition for the SAM scale (pre-stimuli, post-stimuli, post-study), but not between conditions ($F(1, 261) = 0.067, p > 0.10$). Thus, there was no significant difference between conditions based on ad exposure ($t(2) = 0.260, p > 0.10$). In the sexualized ad condition, post-hoc tests revealed a significant effect between pre-stimulus arousal and post-stimulus arousal in the sexualized ad condition ($M_{diff} = -.956, t = -5.339, p_{bonf} < 0.001$; Table 1). There was no significant difference between pre-stimulus arousal and post-study arousal in the sexualized ad condition ($M_{diff} = -.301, t = -1.703, p_{bonf} > 0.10$; Figure 1). This suggests that the sexualized advertisements failed to induce a significantly higher level of arousal compared to pre-stimulus levels (baseline measure). No significant changes across the three SAM measurements ($p > .10$) were observed for the control condition, indicating the control images did not impact arousal and valence. A comparison of post-stimuli arousal across conditions did not reveal the expected increase in arousal in the sexualized advertisement condition ($M_{diff} = .358, t = 1.324, p_{bonf} > 0.10$).

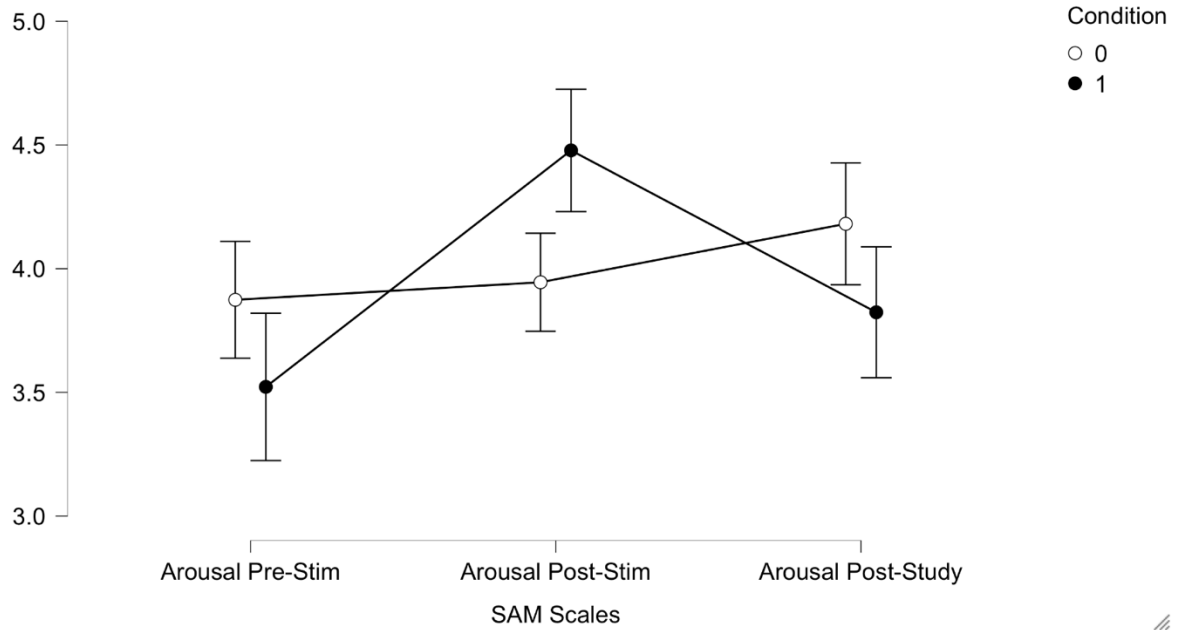


Figure 1. Self-Assessment Manikin (SAM) arousal scores per condition (0 = neutral, 1 = sexualized), 95% confidence interval error bars.

SAM Scales	Condition	Mean	SD	N
Arousal Post-Stim	0	3.945	2.176	127
	1	4.478	2.234	136
Arousal Post-Study	0	4.181	2.252	127
	1	3.824	2.322	136
Arousal Pre-Stim	0	3.874	2.236	127
	1	3.522	1.897	136

Table 2. Arousal means and standard deviations by condition (0 = neutral, 1 = sexualized).

		Mean Difference	95% CI for Mean Difference		SE	t	P _{Tukey}	P _{bonf}	P _{Holm}
			Lower	Upper					
0, Arousal.Pre.Stim	1, Arousal.Pre.Stim	0.352	-0.445	1.149	0.270	1.303	0.784	1.000	1.000
	0, Arousal.Post.Stim	-0.071	-0.611	0.469	0.183	-0.387	0.999	1.000	1.000
	1, Arousal.Post.Stim	-0.604	-1.401	0.193	0.270	-2.235	0.223	0.388	0.310
	0, Arousal.Post.Study	-0.307	-0.847	0.233	0.183	-1.676	0.548	1.000	0.892
	1, Arousal.Post.Study	0.050	-0.746	0.847	0.270	0.187	1.000	1.000	1.000
1, Arousal.Pre.Stim	0, Arousal.Post.Stim	-0.423	-1.220	0.374	0.270	-1.565	0.622	1.000	0.946
	1, Arousal.Post.Stim	-0.956	-1.478	-0.434	0.177	-5.399	< .001***	< .001***	< .001***
	0, Arousal.Post.Study	-0.659	-1.456	0.138	0.270	-2.439	0.145	0.226	0.196
	1, Arousal.Post.Study	-0.301	-0.824	0.221	0.177	-1.703	0.530	1.000	0.892
	0, Arousal.Post.Stim	1, Arousal.Post.Stim	-0.533	-1.330	0.264	0.270	-1.973	0.359	0.736
0, Arousal.Post.Stim	0, Arousal.Post.Study	-0.236	-0.776	0.304	0.183	-1.289	0.791	1.000	1.000
	1, Arousal.Post.Study	0.121	-0.676	0.918	0.270	0.449	0.998	1.000	1.000
	1, Arousal.Post.Stim	0, Arousal.Post.Study	0.297	-0.500	1.094	0.270	1.099	0.882	1.000
1, Arousal.Post.Stim	1, Arousal.Post.Study	0.654	0.132	1.176	0.177	3.697	0.003**	0.004**	0.003**
0, Arousal.Post.Study	1, Arousal.Post.Study	0.358	-0.439	1.154	0.270	1.324	0.772	1.000	1.000

Note. P-value and confidence intervals adjusted for comparing a family of 15 estimates (confidence intervals corrected using the bonferroni method).

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

Table 3. Arousal mean differences and post-hoc tests by condition (0 = neutral, 1 = sexualized).

Valence. The manipulation check for valence using the (SAM) of sexualized ads (vs. control) did not reveal a difference in valence across conditions. The assumption of sphericity was violated (*Mauchly's W* = .951, $p < .001$), therefore the Greenhouse – Geisser correction was applied to the one-way repeated measures ANOVA. A significant effect ($F(1.906, 497.402) = 14.437, p < .001$) was observed within a condition for the SAM scale (pre-stimuli, post-stimuli, post-study), as well as between conditions ($F(1, 261) = 11.311, p < .001$). Thus, there was a significant difference between conditions based on ad exposure ($t(2) = -3.363, p < .001$). In the sexualized ad condition, post-hoc tests show a non-significant effect between pre-stimulus valence and post-stimulus valence ($M_{diff} = -.110, t = -.704, p_{bonf} > .10$; Table 3), with only the difference between pre-stimulus and post-study valence in the sexualized ad condition emerging as significant ($M_{diff} = .551, t = 3.552, p_{bonf} < 0.05$; Figure 2). This suggests valence effects showed no difference before or directly after the exposure to sexualized stimuli. Towards the end of the study valence dropped significantly below the pre-stimulus levels (baseline measure). No

significant changes across the three SAM measurements were observed for the control condition ($p > 0.10$), indicating the control images did not change valence. A comparison of post-stimuli valence across conditions did not reveal a difference in valence ($M_{diff} = -.550, t = -2.239, p_{bonf} > 0.10$).

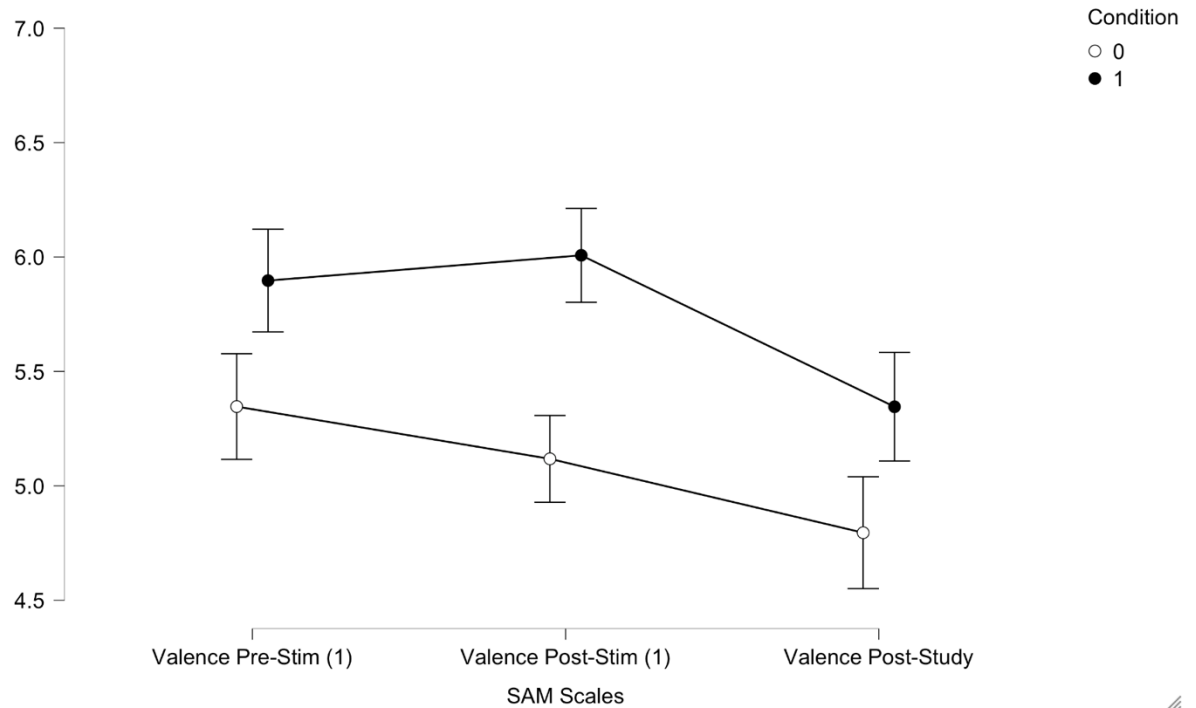


Figure 2. Self-Assessment Manikin (SAM) valence scores by condition

(0 = neutral, 1 = sexualized), 95% confidence interval error bars.

SAM Scales	Condition	Mean	SD	N
Valence Post-Stim (1)	0	5.118	1.721	127
	1	6.007	1.964	136
Valence Post-Study	0	4.795	2.005	127
	1	5.346	2.071	136
Valence Pre-Stim (1)	0	5.346	1.937	127
	1	5.897	1.761	136

Table 4. Valence means and standard deviations by condition (0 = neutral, 1 = sexualized).

		Mean Difference	SE	t	Ptukey	Pbonf	Pholm
0, Valence.Pre.Stim..1.	1, Valence.Pre.Stim..1.	-0.551	0.236	-2.330	0.184	0.303	0.141
	0, Valence.Post.Stim..1.	0.228	0.162	1.409	0.721	1.000	0.637
	1, Valence.Post.Stim..1.	-0.661	0.236	-2.797	0.060	0.080	0.043*
0, Valence.Post.Study	0, Valence.Post.Study	0.551	0.162	3.402	0.009**	0.011*	0.007**
	1, Valence.Post.Study	8.685e -4	0.236	0.004	1.000	1.000	1.000
1, Valence.Pre.Stim..1.	0, Valence.Post.Stim..1.	0.779	0.236	3.297	0.013*	0.016*	0.009**
	1, Valence.Post.Stim..1.	-0.110	0.157	-0.704	0.981	1.000	1.000
	0, Valence.Post.Study	1.102	0.236	4.663	< .001***	< .001***	< .001***
	1, Valence.Post.Study	0.551	0.157	3.522	0.006**	0.007**	0.005**
0, Valence.Post.Stim..1.	1, Valence.Post.Stim..1.	-0.889	0.236	-3.763	0.003**	0.003**	0.002**
	0, Valence.Post.Study	0.323	0.162	1.992	0.348	0.703	0.234
	1, Valence.Post.Study	-0.227	0.236	-0.963	0.929	1.000	1.000
1, Valence.Post.Stim..1.	0, Valence.Post.Study	1.212	0.236	5.130	< .001***	< .001***	< .001***
	1, Valence.Post.Study	0.662	0.157	4.226	< .001***	< .001***	< .001***
0, Valence.Post.Study	1, Valence.Post.Study	-0.550	0.236	-2.329	0.184	0.304	0.141

Note. P-value adjusted for comparing a family of 15

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

Table 5. Valence mean differences and post-hoc tests by condition (0 = neutral, 1 = sexualized).

Hypothesis Tests

The hypothesis tests involved computing one's average k value within each of the six time delays. A k value can be defined as one's rate of discounting the distant choice as a function of time (Vincent, 2016). The average k value for each of the six time delays presented in the binary discounting choice tasks were scored separately (1 day, 7 days, 30 days, 6 months, 1 year, 5 years). In a repeated measures ANOVA, there was a significant effect of time delay ($F(104.890, 42.252) = 647.933, p < 0.001$; after violated assumption of sphericity *Mauchly's W* = .150, $p < .001$). This is in line with previous financial discounting studies showing that choices change significantly between a 1-day delay and a 5-year delay (Boettiger et al., 2007; McKerchar et al., 2013). While the main effect of discounting rates changing over the six time delays for each participant is significant, the interaction effect of conditions was non-significant $F(0.039, 42.252) = 0.243, p > 0.10$; Figure 3).

The regression of experimental conditions (sexualized advertisements = 1, control = 0) on choice revealed an overall null result ($F(1, 261) = 2.679, p = .10$). Due to the failed arousal manipulations through exposure to sexualized advertisements, experimental condition did not lend itself to the test of the hypotheses. Therefore, the researchers performed a modified analysis, to inspect any possible impact of arousal and valence on discounting scores. In a more simplified analysis, regardless of condition, all participants' arousal and valence scores were transformed into two scores: arousal mean difference (pre-stimuli vs. post-stimuli) and valence mean difference (pre-stimuli vs. post-stimuli). These two scores were regressed onto the discounting scores, regardless of the condition. This analysis also resulted in a non-significant regression model across all time delays ($F_{V1}(2, 260) = .339, p = .713, F_{V7}(2, 260) = .584, p = .558, F_{V30}(2, 260) = .474, p = .623, F_{V182}(2, 260) = .121, p = .886, F_{V365}(2, 260) = .045, p = .956, F_{V1824}(2, 260) = .351, p = .705$).

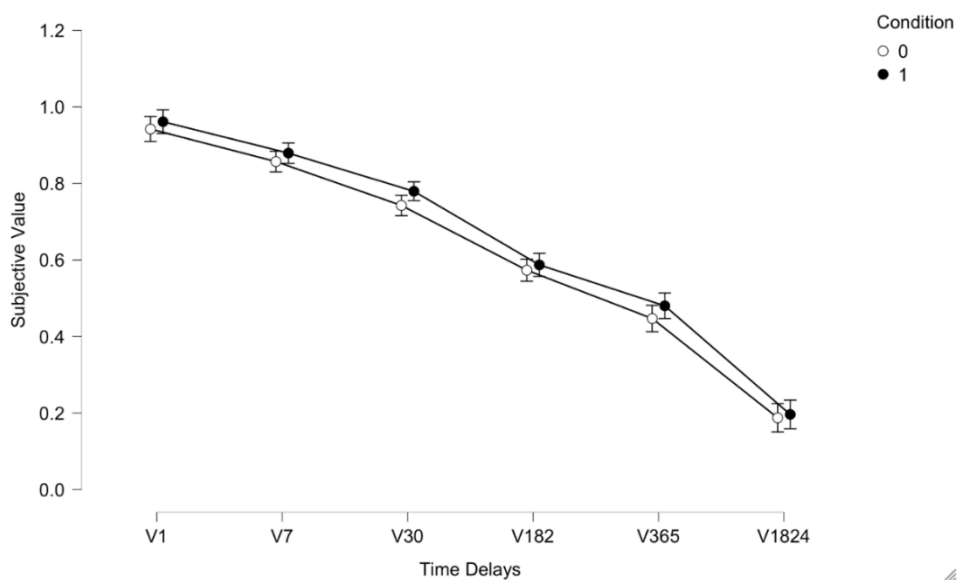


Figure 3. Discounting scores by condition (0 = neutral, 1 = sexualized) as a function of time delay, 95% confidence interval error bars.

Participants' sex and sexual orientation did not have a significant influence on any of the results. Hypothesis 1 was not supported.

In addition, tests of hypothesis 2 did not show a significant impact of BIS/BAS scores on tendency to discount ($F_{V1}(2, 260) = .381, p = .683, F_{V7}(2, 260) = .370, p = .691, F_{V30}(2, 260) = .420, p = .657, F_{V182}(2, 260) = .974, p = .379, F_{V365}(2, 260) = 1.394, p = .250, F_{V1824}(2, 260) = 2.075, p = .128$). Both predictor variables were entered into the regression simultaneously and regressed on each of the corresponding six discounting scores of each participant. The BIS/BAS scores were analyzed to obtain two values (BIS average & BAS average). There was no significant impact of one's trait excitation or inhibition scores (measure for trait impulsivity) on one's tendency to discount and choose the immediate option in the delayed discounting binary choice task. The overall model including the BIS/BAS scores, arousal/valence mean difference SAM scores (pre-stimuli vs. post stimuli arousal & valence), and the condition was also shown to be non-significant across all time delays ($F_{V1}(4, 258) = .324, p = .862, F_{V7}(4, 258) = .473, p = .782, F_{V30}(4, 258) = .427, p = .756, F_{V182}(4, 258) = .520, p = .721, F_{V365}(4, 258) = .718, p = .580, F_{V1824}(4, 258) = 1.318, p = .264$). In addition, participants' sex and sexual orientation did not have a significant influence on any of the results reported here. Hypothesis 2 was not supported.

DISCUSSION

This study examined the relation between arousal and valence elicited by sexualized advertisements and consumers' discounting of financial rewards. No statistical association between sexualized advertisement exposure (aimed at eliciting arousal and positive valence) and consumers' financial discounting emerged. Moreover, there was also no association between trait impulsivity (BIS/BAS scores) and delayed discounting.

In light of the failed manipulation of arousal through exposure to sexualized advertisements, and recurring violation of the assumption of sphericity (i.e., variance between within-participants conditions was unequal), the results of this study need to be viewed with caution. While the Greenhouse–Geisser correction was applied when necessary, violation of sphericity reflects possible confounds that may have affected the results of this study. Overall, the experiment did not elicit differential arousal across conditions and made hypothesis tests challenging. When continuous self-report measures of arousal were used instead, they failed to predict delayed discounting responses. Overall, hypothesis 1 was not supported.

Trait impulsivity did not emerge as a significant predictor of financial discounting in this study, and hypothesis 2 was not supported. This suggests that neither state nor trait arousal impacted delayed discounting functions. This is a surprising and noteworthy result, given earlier findings support such an effect (Amos et al., 2014; Boettiger et al., 2007). Keeping in mind impulsivity is defined as the failure to execute inhibitive behaviour which has domain-specific triggers, it is possible the domain of financial reward discounting is not affected by trait impulsivity as measured by the BIS/BAS scale (Bari & Robbins, 2013; Hofmann et al., 2009). The inclusion of an additional, alternative domain of discounting (e.g., food or sexual choices) in future research would allow for a comparison of inhibitive tendencies across domains at the individual level. This would give researchers the ability to both challenge the narrative of domain-specific impulses as well as compliment the power of their operational design by considering the possible presence of weak inhibitive ability *here*, but strong inhibitive ability *there*.

While this research showed no association between sexualized advertisements and delayed discounting (nor between arousal, valence, and delayed discounting), there are several

potential explanations for the lack of support for the hypotheses: First, this study was conducted online due to COVID-19 restrictions on in-person research. The study would have otherwise taken place in a laboratory setting, which allows for the control of alternative sources of arousal and background noise that could have been at play. With researchers not being able to monitor extraneous variables, it is possible that each participant had a different experience due to environmental factors. Moreover, there was great variance in study completion times. Many participants were disqualified on that basis alone (i.e., data of only 263 of 423 participants were included in the analysis) which speaks to the possible presence of fatigue effects.

Second, the method used in this study (i.e., randomized presentation of binary financial reward choices) may have led to fatigue effects. In the future, it is highly recommended that machine learning software be utilized to adjust the choice options as a function of the participant's previous choice. This would make the task more challenging and interesting for participants while allowing for an assessment of an individual's discounting function in a fraction of the time, thus alleviating fatigue effects. Due to the incompatibility of the algorithm with the Qualtrics online questionnaire software, such an approach could not be adopted in the present study, and may have negatively affected validity, reliability, and generalizability of the study.

Third, the presentation of the binary choices in 150 sequential binary choice tasks posed a threat to ecological validity, based on how reward scenarios are commonly presented in the real world. Rarely do consumers encounter 150 randomized reward scenarios presented consecutively. This raises the question to what extent the current paradigm accurately captures consumers' delayed discounting of rewards in real life characterized by individual choices.

Despite the limitations, there are several implications of this research, particularly

because this study presents one in a series of investigations the researchers have undertaken in regards to the impacts of sexualized stimuli on delayed discounting (Trudeau, Johnson, & Grohmann, 2019). All have failed to detect a consistent, significant relationship between arousal elicited by sexualized ads and consumers' discounting of financial rewards or costs incurred. The null results replicated across different samples, varied experimental designs (i.e., when the stimuli are presented throughout the study, the type of discounting questions presented, accounting for sexual orientation, and using high arousal imagery other than sexualized advertisements), and different testing methods (i.e., lab vs. remote). Thus, evidence increasingly suggests there may be no association between sexualized advertisements and consumers' financial delayed discounting. The current study supports the conclusions drawn in earlier research.

A few avenues for future research nonetheless arise. Because of how a delayed discounting paradigm is implemented, it is difficult to replicate an ecologically valid financial reward scenario which consumers would encounter in real life. As a result, it may be valuable to assess consumers' tendency to choose an immediate reward in response to a highly arousing advertisement by examining consumer choices of products or brands. For example, past research has simulated a retail setting in order to investigate consumer behavior in a physical environment (Niella, Stier-Moses, & Sigman, 2016). Most notably, consumers act differently in crowded spaces, surrounded by other consumers trying to accomplish a similar task (Niella et al., 2016). Offering consumers a reward or rewarding choices in a retail setting where advertisements having a high degree of sexual imagery are displayed, may be a more ecologically valid approach to capturing discounting behaviours.

Moreover, it appears that even though the sexualized advertisements were pretested to show a high degree of arousal and valence, arousal and valence were not consistently rated in the current study, leading to failed manipulations. This suggests perceptions of arousal and valence in response to sexualized stimuli may be unique to the individual. Sexualized ads may have idiosyncratic effects depending on individual preference for type of arousal and sexual orientation. Consumer evaluation of sexualized imagery in advertisements may thus require further investigation.

The fact that the pretested advertisements were high in not only arousal and valence but also in advertising familiarity, raises the question of whether sexualized advertisements are more effective for consumers who have been exposed to them multiple times. This could explain how, even after controlling for trait impulsiveness and sexual orientation, some participants who reported high arousal tended to discount more, while others with the same arousal rating showed no change in discounting behavior. It is possible that responses differ between participants who are familiar with the brands in the advertisements that are sexually explicit, and those who are not. Unfortunately, ratings of individual advertisements were not obtained in the discounting study. It would be interesting to see whether accounting for consumers' perceptions of individual advertisements would contribute to an understanding of the arousal – delayed discounting relationships.

Another variable which may have affected the results of the current study is hostility toward sexual cues. Past studies suggests perceptions of hostility arise with regards to sexualized stimuli (Gramazio et al., 2021), such that some people view unsolicited sexual stimuli as hostile, occasionally eliciting a fight or flight style reaction. Another form of hostility that could be perceived is that of self-comparative tendencies between the consumer and the model in the ad.

Viewing an ad that is widely accepted as being sexually attractive consisting of a body that does not look like the consumers' body can possibly lead to feelings of self-judgement with an overall negative sentiment. From the marketer's point of view, hostility would undermine any positive effect generally associated with the use of sexualized advertisements. The idea of an ad familiarity effect and perceptions of hostility are worthy of consideration in future empirical research, along with exploring how body-positive ads could mediate this effect. Investigation of how the state of arousal could be re-created more efficiently and consistently is of great importance to this field of research, as is the accounting of traits participants bring into the marketplace with them that can considerably impact their behaviour.

The trait of impulsivity was factored into the equation in the current study; however, impulsivity is just the tip of the iceberg when it comes to accounting for personal traits. One's tendency towards risk, and whether the tendency to engage in risky behaviours is domain specific. For example, one can be more prone to sexual and health risk than financial risk. In other words, different trait behaviours can be observed when governing the body vs. the bank account – these small discrepancies in the risky behaviour can result in an enormous difference in the data when not considered. As a result, this poses a threat to measuring one's financial decision-making tendencies as a function of arousal when in fact there are a series of trait behaviours that should be accounted for first.

In the meantime, what are some useful tools for marketers employing sexualized imagery in their advertisements? Over the past decade, the development of technology in artificial intelligence has equipped marketers with more insight than ever before. Start-ups such as Stack Adapt and Noibu have revolutionized the field of marketing analytics with their software, platforms, and specialized toolkits available to marketers.

StackAdapt combines native advertising and artificial intelligence to present online ads that are performing optimally for a specific product type, during a specific time (day, week, month), and geographic location (StackAdapt, 2021). Native advertising is a form of online marketing that presents ads on a website, but with the matching aesthetics of the website, so that the visitor does not view the ad as foreign to their browsing location, allowing for a more seamless transition to the website where the product being advertised can be purchased. Coupled with the constant updating of the best-performing set of ads being presented (based on key performance indicators – KPIs), marketing practitioners are able to save substantially on their cost-per-click (CPC). Complimentary to StackAdapt, Noibu provides a back-end ad toolkit which serves as an ad auditor, providing marketers with key information as to how their ads are loading and being displayed on host webpages, thus allowing the company to detect ad inefficiencies (Noibu, 2021). Because of the surge of e-Commerce hosted businesses and the COVID-19 stay at home orders, a significant portion of business and marketing occurs online, with ads presented on websites and social media. If an ad is taking an extra 1.7 seconds to load its animation effects properly, the CPC average can increase and easily go undiagnosed by the marketer. Noibu identifies computing errors and inefficiencies, increasing the effectiveness and reach of ads. With the combination of services, such as StackAdapt and Noibu, it is possible to implement, track, and improve the delivery of (sexualized) ads. These tools are readily implemented and could be considered for use in further empirical research as well.

In a market that is constantly improving and adding to the marketer's toolkit, marketing researchers are forced to keep up with auditing and analyzing the effectiveness of such powerful tools. Overall, the present study suggests there is a need for further exploration and development

towards more rigorous experimental paradigms to examine the impact of sexualized advertisements on consumers' delayed discounting in the domain of financial decisions.

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Appendix A

Examples of Binary Choice Tasks in Delayed Discounting Paradigm

Which of the following options would you prefer?

- \$1000 Now \$1450 in 6 Months

Which of the following options would you prefer?

- \$1000 Now \$1800 in 1 Month

Which of the following options would you prefer?

- \$1000 Now \$1025 in 1 Day

Appendix B

IAPS Coding Sheet (Arousal & Valence)

IAPS – 3 X 3 (Valence X Arousal) Unit Intervals Coding Sheet

Variable	Min – Max Rating Unit	Interval Range (3)
Valence	1.31 – 8.34	2.34
Arousal	1.72 – 7.35	1.88

Conditions (9)	Valence Rating Range (2.34 unit intervals)	Arousal Rating Range (1.88 unit intervals)
Positive Valence X High Arousal	6.00 – 8.34	5.47 – 7.35
Positive Valence X Medium Arousal	6.00 – 8.34	3.59-5.46
Positive Valence X Low Arousal	6.00 – 8.34	1.72 – 3.58
Neutral Valence X High Arousal	3.66 – 5.99	5.47 – 7.35
Neutral Valence X Medium Arousal	3.66 – 5.99	3.59-5.46
Neutral Valence X Low Arousal	3.66 – 5.99	1.72 – 3.58
Negative Valence X High Arousal	1.32 – 3.65	5.47 – 7.35
Negative Valence X Medium Arousal	1.32 – 3.65	3.59-5.46
Negative Valence X Low Arousal	1.32 – 3.65 (3.94 max)	1.72 – 3.58 (4.14 max)

Appendix C

Barratt Trait Impulsivity Scale

DIRECTIONS: People differ in the ways they act and think in different situations. This is a test to measure some of the ways in which you act and think. Read each statement and put an X on the appropriate circle on the right side of this page. Do not spend too much time on any statement. Answer quickly and honestly.				
	①	②	③	④
	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