

FUNDAÇÃO GETULIO VARGAS
ESCOLA DE ADMINISTRAÇÃO DE EMPRESAS DE SÃO PAULO

LILIAN SOARES PEREIRA CARVALHO

**CONSUMERS AND BIOLOGY: AN INVESTIGATION ON THE EVOLUTIONARY ROOTS
OF CONSUMER BEHAVIOR**

SÃO PAULO
2016

LILIAN SOARES PEREIRA CARVALHO

**CONSUMERS AND BIOLOGY: AN INVESTIGATION ON THE EVOLUTIONARY ROOTS
OF CONSUMER BEHAVIOR**

Tese apresentada à Escola de Administração
de Empresas de São Paulo da Fundação
Getúlio Vargas, como requisito para obtenção
do título de Doutora em Administração de
Empresas.

Campo de conhecimento: Estratégias de
Marketing

Orientadora: Dra. Eliane Pereira Zamith
Brito

SÃO PAULO
2016

Carvalho, Lilian Soares Pereira.

Consumers and biology : an investigation on the evolutionary roots of consumer behavior / Lilian Soares Pereira Carvalho. - 2016.

78 f.

Orientador: Eliane Pereira Zamith Brito

Tese (doutorado) - Escola de Administração de Empresas de São Paulo.

1. Comportamento do consumidor. 2. Marketing. 3. Psicologia genética. 4. Hormônios da hipófise. I. Brito, Eliane Pereira Zamith. II. Tese (doutorado) - Escola de Administração de Empresas de São Paulo. III. Título.

CDU 658.89

LILIAN SOARES PEREIRA CARVALHO

**CONSUMERS AND BIOLOGY: AN INVESTIGATION ON THE EVOLUTIONARY
ROOTS OF CONSUMER BEHAVIOR**

Tese apresentada à Escola de Administração de
Empresas de São Paulo da Fundação Getúlio
Vargas, como requisito para obtenção do título de
Doutora em Administração de Empresas.

Campo de conhecimento: Estratégias de
Marketing

Data da aprovação: __/__/____

Banca examinadora

Dra. Eliane P. Z. Brito (orientadora)

Dr. Delane Botelho - FGV/EAESP

Dr. Felipe Zambaldi - FGV/EAESP

Dr. José Affonso Mazzon - FEA/USP

Dr. Álvaro M. Dias - UNIFESP

Para minha mãe Elza e meu pai, Antonio. Vocês são meus alicerces e deram tudo de si para que eu fosse quem sou hoje, e são meus ídolos. Para meu marido, Enéas, meu parceiro na vida e que apoia todos meus planos e desejos malucos. E, finalmente, à minha filha Beatriz, que é tudo para mim e sem ela minha vida não teria sentido. Eu te amo infinitamente, Bia!

To my mother Elza, my father Antonio, my pillars, my rocks, those who gave everything for me to be who I am today. To my husband Enéas, my partner in life, who supports all my crazy dreams. And, finally, to my daughter Beatriz, who is my everything and without her my life has no meaning. I love you to the moon and back, Bia

AGRADECIMENTOS

Uma tese não se faz sozinha, e eu com certeza não teria nem começado essa aventura se não fosse pela minha querida orientadora, a quem chamo de amiga há 10 anos: Eliane Brito. Ela guiou cada passo dessa jornada, com carinho e amor. Eliane, tudo que faço como professora e pesquisadora é influenciado pelo seu exemplo, que apostou em uma menina boba e ingênua há 10 anos e me transformou em alguém que tenho orgulho, como pesquisadora e professora. Obrigada por tudo!

Em segundo lugar agradeço ao meu professor canadense Gad Saad, que em 2014 me recebeu em Montreal me ensinando sobre psicologia evolucionista e abrindo as portas para que os dois artigos sobre oxitocina e um sobre diferenças entre os sexos que compõe essa tese pudessem ser escritos. Sem essa oportunidade, e sem a sua generosidade eu não poderia ter trilhado este caminho, que antes parecia um sonho.

Aos professores Barbara Flynn, Ashish Sood, Mário Aquino Alves, Delane Botelho, Juracy Parente, Tania Veludo, Tania Limeira, Marta Savastano, Diógenes Bido, Eduardo Ottoni, Eliane Rapchan, Jennifer Bartz, Mark Ellenbogen e Johnny Rungtusanatham. Dizem que a academia é um ambiente hiper-competitivo, mas desde que comecei minha vida de pesquisadora só encontrei generosidade, desde emprestar casacos de inverno por um ano (obrigada, mestre Yoda), passando por reuniões de 3 horas explicando as bases do comportamento de primatas e como a oxitocina funciona (profs. Eliane Rapchan, Mark Ellenbogen e Eduardo Ottoni), até cartas de referência que mudaram minha vida (Ashish Sood, Delane Botelho e Barbara Flynn). Sem contar inúmeros e-mails e mensagens de celular quando o “calo apertava”. Cada letra dessa tese é uma homenagem à generosidade de todos vocês.

Mas não foi só de mentores que se fez esse trabalho. Meus amigos e companheiros, que conheci durante essa jornada, foram essenciais. À querida Giuliana Isabella, que me tomou sob suas asas e, sem querer nada em troca, tirou dúvidas, revisou textos, ensinou como lidar com softwares e ainda me ouviu chorar e lamentar em momentos difíceis. Aos amigos Lucia Barros, Marina Gama, Taís Pasquotto Andreoli, Carlos Eduardo Lourenço, Carla Abdalla, Suzana Batistella, Gustavo Porpino, Carol Zanette, Chaim Kuhnreich, Yves Dupuis, Rui Chen, Farah Braga e Marcelo Sá por terem me aturado, me ajudado com respondentes, enviado e-mails, me substituído em aulas, tudo para que essa tese fosse terminada. Amo vocês queridos!

Ao CNPq (Conselho Nacional de Pesquisa) pela bolsa de estudos.

Por fim, um agradecimento especial àqueles que sofreram e se alegraram junto comigo: minha mãe Elza, que sofreu com nossa ausência mas é minha maior incentivadora. É por causa dela que sou a mulher que sou hoje, mas nunca chegarei aos seus pés! Ao meu pai, que com sua firmeza e às vezes até severidade me tornou uma mulher mais forte, sem seus ensinamentos talvez eu tivesse desistido no meio do caminho. Meu marido e minha filha, obrigada por aturar minhas ausências e por apoiar cada ideia maluca que eu tinha. Minha tia Lica e minha vó Jamille, pilares que torcem por mim sempre. Minha tia Miriam, que se deslocou milhares de quilômetros para ver se estávamos bem em Montreal. Meu sogro Raul e minha sogra Elena, que são como pais pra mim e se orgulham de tudo que faço. Minha amiga Camilla Gabriel e meu amigo Abel Ribeiro, que cuidaram de tudo pra mim enquanto morei fora do Brasil. Enfim, como diz o poema de John Donne “No man is an island entire of itself; every man is a piece of the continent, a part of the main(...)”. Eu não sou uma ilha, faço parte de um todo, e agradeço a Deus por todas essas pessoas que fazem parte da minha vida, e, por que não, parte de mim.

ACKNOWLEDGMENTS

A dissertation is not done alone, and I certainly would not have even started this adventure if it were not for my dear supervisor, whom I have been calling my friend for almost 10 years: Eliane Brito. She guided every step of this journey with care and love. Eliane, everything I do as a teacher and as a researcher is influenced by your example, you, who met a silly and naive girl almost 10 years ago and turned me into someone that I am proud to call a researcher and teacher. Thanks for everything!

Secondly, many thanks to my Canadian professor Gad Saad, who in 2014 welcomed me in Montreal to teach me about evolutionary psychology and opening the doors to the two articles on oxytocin and one on gender differences that make up this dissertation. Without him and the opportunity he gave me, I could not have walked a path that before seemed like a dream.

To the professors Barbara Flynn, Ashish Sood, Mário Aquino Alves, Delane Botelho, Juracy Parente, Tania Veludo, Tania Limeira, Marta Savastano, Diogenes Bido, Eduardo Ottoni, Eliane Rapchan, Jennifer Bartz, Mark Ellenbogen and Johnny Rungtusanatham. They say that academia is a hyper-competitive environment, but since I started my life as a researcher I only found generosity, since loaning winter coats for a year (thank you, Master Yoda) through meetings of 3 hours explaining primate behavior and how oxytocin works (Drs. Eliane Rapchan, Mark Ellenbogen and Eduardo Ottoni), to reference letters that changed my life (Ashish Sood, Delane Botelho and Barbara Flynn). Not to mention countless emails and mobile messages whenever things got hectic. Each word of this dissertation is a tribute to the generosity of all of you.

But this dissertation is not only the work of my mentors. My friends, whom I met during this journey, were essential. To my dear friend Giuliana Isabella, who took me under her wings and, without wanting anything in return, answered questions, revised texts, taught me how to deal with software and I still heard me crying during difficult times. Also to my friends Lucia Barros, Marina Gama, Taís Pasquotto Andreoli, Carlos Eduardo Lourenço, Carla Abdalla, Suzana Batistella, Gustavo Porpino, Carol Zanette, Chaim Kuhnreich, Yves Dupuis, Rui Chen, Farah Braga and Marcelo Sá for putting up with me, helping me with respondents, sending emails and replacing me in classes. Love you guys!

To the Conselho Nacional de Pesquisa (CNPq) for the scholarship.

And finally, special thanks to those who have suffered and rejoiced through all with me: my mother Elza, who suffered with our absence during our year abroad, and is my biggest fan. It is because of her that I am the woman I am today, but still I will never measure up to her! To my father, that with his firmness and sometimes severity made me a stronger woman. Without his teachings I might have given up. To my husband and my daughter, thank you for putting up with my absences and thank you for supporting every crazy idea that I had. Lica my aunt and my grandmother Jamille, pillars that support me always. To my aunt Miriam, who traveled thousands of miles to see if we were all right in Montreal. My father-in-law Raul and my mother-in-law Elena, who are like parents to me and take pride in everything I do. My friend Camilla Gabriel and my friend Abel Ribeiro, who took care of everything for me while I lived abroad. At last, as the poem of John Donne states "No man is an island entire of itself; every man is a piece of the continent, a part of the main (...)". I'm not an island, I am part of a whole, and thank God for all those people who are part of my life, and, why not, part of me.

“We are born with impulses that draw us to others and that later in life make us care about them.”

Frans de Waal, Our Inner Ape: A Leading Primatologist Explains Why We are Who We Are

ABSTRACT

This dissertation is a set of three studies focusing on the implications of evolutionary psychology (EP) to consumer behavior research. EP derives from the Darwinian theory of evolution and posits that just as our bodies are subject to natural and sexual selection, also our minds are adapted to their environment and, as such, we can investigate the biological basis of our behaviors. The first study is a theoretical article, focusing on the effects of hormone oxytocin (OXT) on consumer behavior. OXT has been shown to have effects on maternal care, attachment, relationships, and trust. This hormone is the focus of studies in behavioral economics, psychology and neurology, with obvious implications for consumer behavior. Previous studies on OXT have shown that oxytocin is related to our social life, i.e. related to situations with family and friends, as well as increasing our attention to the social cues in our faces (as eye gaze and smiles). Research on OXT and other hormones opens a new era of interdisciplinary studies on consumer behavior, in which researchers can incorporate psychometric measures (answered by research subjects) to biological features, as OXT, endorsing and validating findings that go beyond responses to questionnaires. It is thus possible to investigate the biological basis of consumer behavior regarding the effects of OXT on measures such as brand trust, and others. The second article is an experimental study, double-blinded, that checks the effects of OXT on brand trust. The results show that OXT is context-dependent, and it shows its most prominent results when the brand relates to social situations (friends and family). Three experiments were conducted comparing known and unknown brands, the country of origin effect and social and status brands. Known and unknown brands improved their brand trust measures when respondents were under the effect of OXT compared to placebo. Furthermore, social brands had the most pronounced effects of OXT when compared to status brands. Thus, this is first study to show positive effects of OXT on brand trust. The final study is an investigation of the post-modern epistemology to the positivist paradigm in the sex *vs.* gender subject. Various researchers posit that gender is as a new paradigm for our generation, in which every individual can choose his set of male and female characteristics. But when comparing the effect of biological sex *vs.* gender (using the Bem Sex-Role Inventory) in retaliatory behaviors in a consumer setting, only sex was able to explain the differences in behavior, not gender. Although post-modernists affirm that our biology only affects our gender as far as our genitals are concerned, differences in retaliatory behaviors are better explained by sex, not gender, corroborating the positivist epistemology.

Keywords: Consumer behavior, Evolutionary Psychology, Marketing, Oxytocin.

RESUMO

Essa tese é um conjunto de três estudos tendo como pano de fundo teórico a psicologia evolucionista. Esta deriva da teoria da evolução darwiniana e postula que, assim como nossos corpos foram sujeitos à seleção natural e sexual, também nossas mentes são adaptações ao ambiente e por isso podemos investigar as bases biológicas de nossos comportamentos. O primeiro artigo, teórico, foca no hormônio oxitocina, cujos efeitos vão do cuidado materno até a confiança. Esse hormônio é objeto de estudo da economia comportamental, da psicologia e da neurologia, com implicações óbvias para o comportamento do consumidor. Estudos prévios comprovam que a oxitocina é um hormônio relacionado à nossa vida social, i.e. relacionado a situações com família e amigos, além de aumentar nossa atenção às “pistas” sociais em nossas faces (como olhares ou sorrisos). A pesquisa com oxitocina, e outros hormônios abre uma nova era de estudos interdisciplinares no comportamento do consumidor, na qual os pesquisadores podem aliar medidas psicométricas respondidas pelos sujeitos de pesquisa, mas adicionando o elemento biológico, referendando e validando achados que vão além de respostas a questionários. É possível, assim, investigar as bases biológicas do comportamento do consumidor. O segundo artigo é um estudo experimental, duplo-cego, que verifica os efeitos da oxitocina na confiança da marca. Os resultados mostram que a oxitocina tem efeito dependente do contexto, sendo seus resultados mais proeminentes quando as marcas se valem de apelos que relembrem família e amigos. Foram realizados três experimentos, comparando marcas conhecidas e desconhecidas, efeito do país de origem e marcas sociais e de status. Marcas conhecidas e desconhecidas tiveram a confiança aumentada quando os respondentes estavam sob o efeito da oxitocina, quando comparado com o placebo. Além disso, marcas sociais tiveram efeitos mais pronunciados da oxitocina, quando comparados com marcas de status. Assim, fica pela primeira vez registrado o efeito da oxitocina na confiança da marca. O último estudo é uma investigação sobre a epistemologia relativista comparando-a ao paradigma positivista na questão sexo *vs.* gênero. Muito se fala do gênero como novo paradigma para nossa geração, na qual cada indivíduo poderá escolher seu conjunto de características femininas e masculinas. Mas, ao comparar o efeito do sexo biológico *vs.* o gênero (usando o inventário sexual de Bem), somente o sexo foi capaz de explicar as diferenças de sexo, não o gênero. Apesar de relativistas culturais afirmarem que a biologia do sexo só influencia a genitália dos seres humanos, o comportamento de retaliação em comportamento do consumo é explicado pelo sexo, e não pelo gênero dos indivíduos, corroborando a epistemologia positivista.

Palavras-chave: Comportamento do Consumidor, Psicologia Evolucionista, Marketing, Oxitocina.

SUMMARY

1	GENERAL INTRODUCTION.....	3
2	PERSPECTIVES FOR OXYTOCIN IN CONSUMER BEHAVIOR RESEARCH.....	5
2.1	Introduction.....	5
2.2	How oxytocin works	5
2.2.1	Oxytocin = Love?	8
2.3	Future research for oxytocin in consumer behavior: VARIABLES OF INTEREST	11
2.3.1	Trust (interpersonal and brand trust)	12
2.3.2	Celebrity Endorsers	13
2.3.3	Gift Giving.....	13
2.3.4	Donations.....	14
2.3.5	Retaliation.....	14
2.4	References	15
3	AN EXPERIMENTAL APPROACH ON THE RELATIONSHIP BETWEEN OXYTOCIN AND BRAND TRUST.....	19
3.1	Introduction.....	19
3.2	Oxytocin and trust.....	21
3.2.1	Brand trust	28
3.3	Methods.....	35
3.4	Results of study 1 – Known x Unknown brand	37
3.5	Results of study 2 – Country-of-origin effects.....	40
3.6	Results study 3 – Social x non-social stimuli	41
3.7	Discussion	44
3.8	References	47
4	SEX DIFFERENCES IN RETALIATORY BEHAVIORS: A COMPARISON BETWEEN BIOLOGICAL SEX AND GENDER SCHEMA THEORY	55
4.1	Introduction.....	55
4.2	Sex and gender differences in consumer behavior.....	56
4.2.1	Sex differences in aggression and retaliatory behaviors	59
4.3	Methods.....	63
4.4	Results.....	64
4.5	Discussion	66
4.6	References	68
4.7	Appendix 1 – Vignettes used in the experiment	71
4.8	Appendix 2.....	73
4.9	Appendix III.....	75
5	GENERAL DISCUSSION	77

List of Tables

Table 1 – Brand Trust Scale	31
Table 2 – Participants per condition.....	64
Table 3 – Scale Reliability	64
Table 4 – Genders Frequencies on Sample	65

List of Figures

Figure 1 – The Oxytocin System	11
Figure 2 – Known vs. Unknown brand stimuli	37
Figure 3 – COO Ad Stimuli	40
Figure 4 – Social vs. Non-social stimuli	42

List of Graphics

Graphic 1 – Brand Reliability Mean Plot.....	39
Graphic 2 – Brand Familiarity Mean Plot.....	40
Graphic 3 – Brand Intentions Mean Plot.....	42
Graphic 4 – Brand Reliability Mean Plot.....	44
Graphic 5 – Means for Perceived Betrayal	65

1 GENERAL INTRODUCTION

In my teens I found a book in my fathers' library, "The naked ape", by Desmond Morris (1968). It is an eye-opening book, written with wit, and describes human behavior as a part of Darwinian evolution. I read it during my undergrad years, and its findings stroke me as genius and scientifically rigorous, things I could not see in marketing research in particular or business research in general, during my undergrad classes. All of our theories seemed to me without data, without rigor, without a theory that integrated marketing and business life to human life.

As a PhD candidate, my goal was to integrate evolutionary theory to marketing research. I read all I could find on evolution, from Darwin (1888) to E. O. Wilson's (1975) seminal work "Sociobiology: the new synthesis". And then I found Gad Saad's books (2007, 2011), who has been working with evolutionary psychology applied to consumer behavior for more than 20 years. His work made me feel that I was not an only warrior fighting to transform marketing into an integrated body of scientific work. I was fortunate enough to study under his tutelage.

In Saad's (2008) words, human beings, obviously, are biological beings. We were selected and shaped by evolution as any other animal, cell or virus on this earth. This may seem obvious, but he draws attention to marketing scholars' "collective amnesia" regarding the evolutionary roots of our behavior. Indeed, this is a topic understudied in marketing journals (Saad, 2007, 2008, 2011).

As such, this dissertation is a collection of three articles having the evolutionary roots of our behavior as background and metatheory. The layman knows that there is something called "human nature". A behavior observed in virtually all dogs is tail shaking and there are some behaviors that are ubiquitous to humans. Language is one of them. Living in groups, cooperating with one's peers is another one (Pinker, 2005).

As such, the first two articles focus on a neuropeptide, oxytocin (OXT). The understanding is that humans are just like any other animal, and we have impulses and instincts that are influenced by hormones in our brains and our bodies, just as Darwinian evolutionary theory predicts. Unfortunately, marketing researchers are not as open to this idea as the layman, and the lack of studies in the most prominent journals of our field shows that (Saad, 2008). My study helps to bridge this gap.

OXT has been the focus of research trying to understand trusting and cooperative behavior amongst humans. My first article is a theoretical investigation of what has been found on the effects of OXT on human behavior and it draws a list of variables of interest to be studied on the relationship of OXT and consumer behavior.

The second study is an investigation of the effects of OXT on brand trust and related measures. Three experiments were designed to test if OXT had any effect on brand trust.

The final paper focuses on a different issue: gender and sex differences on consumer behavior. The idea for this paper came when reading an article in “The Washington Post” that attested that Sweden was adding a genderless pronoun to their language because they regard gender as a meaningless construct (Noak, 2015). Evolutionary theory opposes that notion: males and females of most species are subject to different evolutionary pressures, and as such they should behave differently in certain circumstances. This is the case for retaliatory behaviors: men and women should behave different when presented with different service failures situations. I designed a scenario- based vignette experiment (Rungtusanatham, Wallin & Eckerd, 2011) to compare difference in retaliatory behaviors using biological sex or gender (using the Bem’s (1981) Sex-Role Inventory) as independent variables. Evolutionary reasoning predicts that biological sex will entail more differences, whereas the post-modernist view posits that gender is irrelevant, people can choose whichever gender they identify with. In the following pages we will see which one entails better results.

2 PERSPECTIVES FOR OXYTOCIN IN CONSUMER BEHAVIOR RESEARCH

2.1 INTRODUCTION

“Liquid trust” is a product manufactured and commercialized by a company based in Boca Raton, Fl. It promises to help people get their way, as journalist from the online journal “Thought Catalog” describes it. Armed with the spray, she tried to return old worn shoes and clothes in Manhattan and also to make her boyfriend do what she says (Berliet, 2013). That is what most people have in mind when we talk about OXT and what it can represent to consumer behavior research. As I dig deep into the works of OXT in our brains and body, I will try to deconstruct this idea and show that indeed, there are neurobiological bases for our behavior, but no magic pill, nor spray for that matter, will ever give us clean cut results.

OXT is a molecule present in our brains and our bodies, and it can be the cause of a few behaviors, such as trust, attachment, and love (Bartz, 2011). It is an ancient molecule, and we can find it in all mammalian animals. OXT is better understood for its peripheral effects: it induces labor contractions and milk letdown in women (Domes et al. 2010). It may seem surprising to some, but OXT, and other molecules for that matter, also influence our brains and our behavior. As Saad (2007) calls marketing researchers to study the biological underpinnings of human behavior, OXT is essential for marketing, if we wish to understand the hormonal roots of our behavior. In the following sections you will discover how OXT works and how marketing researchers can use it in consumer behavior studies.

2.2 HOW OXYTOCIN WORKS

Oxytocin (OXT) is known in lay circles as the “love hormone” (Bartz et al., 2011) and is associated with increased trust among humans, mainly after the seminal work of Kosfeld et al. (2005) in which the authors infused participants of the trust game either with a dose of

intranasal OXT or a placebo and demonstrated that OXT increased trust and trustworthy behavior among the participants.

After that paper the interest on applications of OXT in social psychology, psychiatry, economics and neuroscience skyrocketed, according to Bartz et al. (2011), between 2001 and 2011 four times more papers were published on the matter. One can only deduce that the next logical step is to verify the importance of OXT in consumer relationships. But first let's begin with a review of the neurophysiology of OXT and its multiple roles in behavior, that reach further than only love and attachment.

The research on OXT began in 1909, when a researcher called Henry Dale discovered that the extracts of the feline pituitary gland caused contractions in pregnant cats (Guastella et al., 2013). This is what physicians call peripheral OXT system, because it works outside of the brain. After that first discovery, OXT continued to spark interest of research in both human and animal behavior, as virtually all-vertebrate species possess OXT or OXT-like hormones that facilitate reproduction (Dumais & Veenema, 2015). In the peripheral human nervous system, OXT can induce contractions during labor (naturally or exogenously administered, intravenously) and facilitate lactation in women (again, both naturally or exogenously administered, intranasally). OXT studies benefited greatly of the studies of one little rodent species: the prairie voles. These small animals exhibit alloparental care of offspring and form monogamous pairs. When compared to a similar species, the montane voles, which are more aggressive and are more promiscuous, OXT and OXT receptors in the brain are thought to be the cause of the differences (Beery, 2015). Neuroimaging studies do not grasp the multitude of OXT receptors in the brain, therefore the most common form of research in this area are causal studies infusing participants with intranasal OXT (Guastella et al., 2013).

In behavioral human experiments the spark was ignited by the seminal work of Kosfeld and colleagues in 2005, as mentioned above. The majority of the studies use the intranasal administration of OXT because, according to Guastella et al. (2013) the absorption of the intranasal form of OXT can, potentially, cross the blood-brain barrier, fact that is confirmed by VanIjzendoorn and Bakermans-Kranenburg (2011) affirming that the use of intravenous OXT does not cross this same barrier, producing no behavioral outcomes. But there are also two other methods that researchers could use in OXT studies: (1) OXT measurement in bodily fluids such as saliva, urine, blood or cerebrospinal fluid and (2) correlational studies dealing with genotyping OXT receptors polymorphisms (Heinrichs et al., 2009). Most studies dealt with intranasal OXT administration because neuroscientists have not reach consensus as to which degree bodily fluids represent the correct amount of OXT in the brain. There are only a few genotyping studies because it is still a very expensive technique (Heinrichs et al., 2009). As such, this paper focuses mostly with exogenously administration of OXT.

Guastella et al. (2013) is particularly important for any CB researchers interested in OXT research, because it posits the guidelines regarding standardization procedures when using intranasal OXT. The administration of OXT is also the preferred use in experimental designs as to guarantee internal validity and explore causation, as Beery (2015) states: peripheral measurement of OXT via saliva or cerebral-spinal fluid is only moderate correlated with brain OXT levels. An additional difficulty of measuring peripheral OXT is that OXT molecular structure is almost identical to vasopressin, another pituitary hormone associated with social behavior, and they differ only by two aminoacids, making the exogenous intranasal administration of OXT more reliable (Beery, 2015; Dumais & Veenema, 2015). VanIjzendoorn and Bakermans-Kranenburg (2011) also affirm that, in addition to intranasal administration of OXT, double-blind experiments, in which both the participants and the

researchers are unaware of the content of the vessels containing OXT are crucial to guarantee causation.

Having explained how OXT works both peripherally and in the brain and why exogenous administration of OXT is the preferred method of investigation, what have the researchers discovered so far as to the effects of OXT in behavior? Is it really the “love hormone”?

2.2.1 Oxytocin = Love?

As most marketing scholars are not familiar with neuropsychological terminology, it seems appropriated that we make a pause to explain what we mean by social and affiliative behavior: as a species, humans evolved specific solutions to their environment and were subject to Darwinian evolution. Saad (2007) affirms that human behavior can be considered with reference to the four Darwinian modules that have evolved to solve specific problems in our evolutionary history: (1) the survival module, which relates to nourishment, shelter, and protection; (2) the reproductive module, which entails mating and sexual display; (3) the kin-selection module, which incorporates investment in one’s kin, such as nurturing children and family, and (4) the reciprocation module, which relates to friendships and coalitions. Regarding the role of OXT and the effects it can have on social behavior, we mean that OXT plays a role in the kin-selection and the reciprocation module, meaning that it has effects in the relationships among kin and friends. So, when I affirm that OXT relates to social and affiliative behavior, bare in mind I mean kinship and friends and those relationships that permeate human life.

The first studies seemed to agree with this view: OXT indeed seemed to promote social and affiliative behavior (Bartz et al., 2013; Bethlehem et al., 2014, Van IJzendoorn & Bakermans-Kranenburg, 2012). In Kosfeld et al. (2005) seminal work, participants played a

version of the trust game in which they were either assigned to the OXT treatment or the placebo (carrier minus the hormone) then later asked to transfer an amount of money, which the researchers called monetary units (MU) to a trustee. The OXT group transferred a mean of 9.6 MU, in comparison with 8.1 MU from the placebo group ($p < 0.05$, one tailed). After that study there were several published investigating different versions of trust and cooperation between humans and VanIjzendoorn and Bakermans-Kranenburg (2011) provided us with a meta-analysis of the results, in which the mean effect size was $d = 0.43$ ($p < 0.01$), being higher for the OXT groups. For these authors, OXT increasing trust in the in-group makes sense from an evolutionary perspective, because it can potentially enhance the inclination to protect offspring and to affiliate with the in group, but the results are not invariable throughout all contexts and situations: since before this meta-analysis there has been a suspicion that, if OXT could increase in-group affiliation, it could also increase out-group aversion (VanIjzendoorn & Bakermans-Kranenburg, 2011).

Bartz et al. (2011) says that these seemingly puzzling results in OXT research will give us a cleaner picture of the neurobiological bases of trusting and affiliative behavior. Several studies investigating the role of OXT in social and affiliative behavior found either null results or context-dependent effects (Heinrichs et al., 2004; Bartz et al., 2011; De Dreu et al., 2010). According to Bartz et al. (2011) almost half of the studies dealing with trust, cooperation, attachment, i.e. prosociality, found no significant main effects between these variables and the use of exogenous OXT. As Beery (2015) puts it “oxytocin cannot be defined by anyone of its functions” (Beery, 2015, p. 6). If this theory piece is to achieve its goal, we must first to debunk the association between “love” and “oxytocin” regardless of context and individual differences.

Let us begin with the review done by Bartz et al. (2011), in which the authors affirm that the effects of OXT on trust vanish if the trustee is portrayed as unknown, unreliable or is

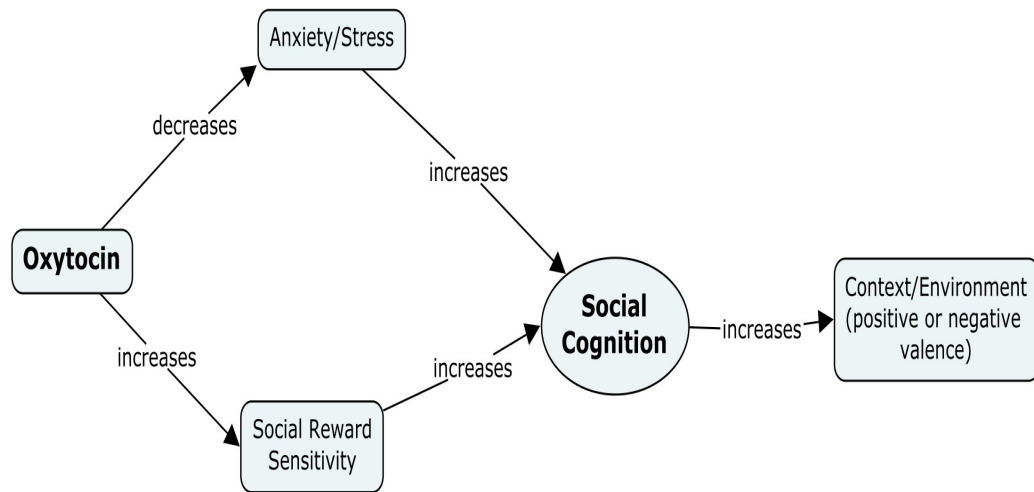
a member of a social out-group. In addition, 43% of the published studies (until 2011) showed no main effect of OXT, 63% reported situational, context-dependent and individual differences as moderators. So much for Love = OXT.

The explanation for these results requires an integrative approach, in which scholars will account for context and individual differences when analyzing the effects of OXT in behavior (Bartz et al., 2011, Bethlehem et al., 2014). For Van Anders, Goodson and Kingsbury (2013) OXT can act as a social amplifier. Bartz et al. (2011) affirm that OXT has been proven to enhance gaze to the eye region, perhaps the most emotional revealing part of our bodies. As Bartz et al. (2011) states:

Increasing people's attention to social cues can be expected to magnify prosociality when dealing with familiar, close or reliable others but diminish prosociality under situations of competition, uncertainty or when interacting with outgroup members (Bartz et al., 2011, p. 306).

Bethlehem et al. (2014) propose the following framework to understand the seemingly contradictory and context dependent effects of OXT (Figure 1). As seen in Figure 1 OXT reduces anxiety, but it does not have an anxiolytic invariant effect: it only reduces social anxiety (interactions with other people). And it may only work as an anxiolytic for a member of the in-group but not for the out-group. The in-group is composed of familiar individuals, usually perceived as "one of us", whereas out-groups are composed of different or competing, unfamiliar individuals (Shalvi & De Dreu, 2014).

Figure 1 – The Oxytocin System



Source: Adapted from Bethlehem et al (2014)

OXT also positively affects the social reward system: it makes people interaction more pleasurable. Bethlehem et al. (2014) states that OXT increases the “liking” and “wanting” for social interaction. Both of these primary effects positively affects social cognition, as shown by Ellenbogen et al. (2012), mainly by enhancing memory for faces and attention to the eye area, making people more aware of subtle social cues. Which it really translates in any social cues being more salient: if someone poses a threatening face, this too will be more salient. In the words of Bethlehem et al. (2014, p. 2): “Anxiety and social reward sensitivity (...) might, in a given context, either promote or impede social behavior”. Which researchers have yet to account for is the valence of the context or the environment (positive or negative). That is exactly why we cannot affirm that oxytocin = trust because OXT can make people more aware of negative cues on the environment, and thus increase aggression, contrary to popular beliefs nowadays (Bethlehem et al., 2014; Bartz et al, 2011; Van Anders et al., 2013).

2.3 FUTURE RESEARCH FOR OXYTOCIN IN CONSUMER BEHAVIOR

Knowing how OXT works and its possibilities, what is the pathway for future research in consumer behavior? I created a list with few variables that should interest both academics and

practitioners, deriving from work previously done in psychology and neuroscience. Keep in mind this is not a definitive list of the only variables that OXT may affect in consumer behavior, but mainly a tentative list of the first ones to be investigated.

2.3.1 Trust (interpersonal and brand trust)

The seminal work by Kosfeld et al. (2005) showed that participants infused with OXT, when playing a version of the “trust game” transferred 18.5% more money to their counterparts than participants infused with the placebo. This study opened the path to more behavioral economic studies with the prisoner’s dilemma, the cooperation game (Declerc, Boone & Kiyonari, 2013) and the dictator’s game (Israel et al., 2009). These were all instances in which intranasal OXT was used to validate interpersonal trust or cooperation. But, up until now, we had no studies in marketing and/or consumer behavior investigating the role of OXT in interpersonal trust (between vendor and customer, for instance). Many companies use personal sales (Avon, Mary Kay, car dealerships, etc.) as a means to promote their products/services. It seems, by the economic literature, that OXT plays a role in trust between vendors and customers, and marketing literature could benefit from the investigation of this relationship.

Furthermore, brand trust is a concept that was the subject of a Nature article (Fürst et al., 2015) in which the authors investigated if OXT increased trust between consumers and brands. The results were that OXT increased trust for brands (previously screened as high or low attachment to the consumers). Infusing participants with OXT increased the means for brand trust both in the high and low attachment categories. This opens a broad range of studies regarding brands: in addition to brand trust researchers could focus in the antecedents and consequents of brand trust such as brand familiarity, brand attachment, affect whilst investigating the influence of OXT on these measures. Also, one could try to replicate the

effects of OXT (intranasal infusion) by using hugs, handshakes and measuring the salivary OXT to verify if this social stimuli influence the OXT receptor system.

2.3.2 Celebrity Endorsers

The use of celebrity endorsers is common practice by advertisers (Erdogan, Baker & Tagg, 2011). But is it effective? The results are mixed, mainly because endorsement can go really wrong when the celebrity in question is not perceived as a “match” with the product (for example, Barcelona’s fans would buy products endorsed by Lionel Messi but not Cristiano Ronaldo). OXT can play a role in identifying when celebrity endorsers match the image of the brands in question (as per attachment). For example, we can measure salivary OXT levels when a celebrity is used as an endorser to the brand. The higher OXT levels, the higher the attachment to both the endorser and the brand.

Fürst et al. (2015) have stated that OXT works with brands that participants already recognized as being of high attachment to them, with or without the use of endorsers. But for practitioners, it is important to know if endorsers increase the likeability of brands and/or products in all sorts of situations, e.g. local endorser or foreign? Males appeal more to females and vice versa? What is the role of OXT in increasing the likeability of a brand using an endorser? These are the questions that consumer behavior research has yet to answer.

2.3.3 Gift Giving

In their seminal paper, Kosfeld et al. (2005) participants of the experiment played a version of the trust game. Participants received an endowment of 12 monetary units (MU) and could chose to transfer a range of 0 to 12 MU to a trustee. Investors infused with OXT transferred more MU to their trustees, i.e. 18.52% higher transfers than the placebo group. Based on this results we can suggest that marketing researchers investigate the role that OXT plays on gift

giving. Saad (2011) states that gift giving is a part of our biology, relating to the reciprocation module. Friends and family give gifts in order to maintain and show that they value these relationships. I postulate that OXT is involved in gift giving practices among humans, and people infused with OXT ought to give larger and more expensive gifts to their counterparts.

2.3.4 Donations

Huffmeijer, Alink, Tops and Bakermans-Kranenburg (2012) investigated if OXT had a moderating effect on donations in relation to parent withdrawal in infancy. They found that OXT increased donations for participants that reported low parental withdrawal in infancy. Lin et al. (2013) is one of these studies: the authors investigated if OXT had a positive effect on public service announcements (PSAs) and the use of intranasal OXT increased donations by 56% when compared to the placebo group. Marketing researchers could replicate this study to see in which conditions OXT affects donations.

2.3.5 Retaliation

Until now I have been suggesting variables to be studied under the influence of OXT that are “positive” such as trust, gif-giving and donations. Bu as mentioned in the literature review OXT is not equal to love. Grillon et al. (2012) and Shalvi and De Dreu (2014) performed experiments in which they investigated the “dark” side of OXT.

Grillon et al. (2012) demonstrated that OXT makes people more anxious when evaluating an unpredictable threat (shocks administered randomly). Shalvi and De Dreu (2014) showed that people were more prone to lie when protecting their in-group. Extrapolating these “dark” side results, researchers could investigate the role OXT plays in retaliatory behaviors. Does it make people more or less prone to retaliate?

In consumer behavior, firms deal with retaliation from consumers. After a service failure, your best customers could turn into your worst enemies (Gregoire & Fisher, 2008). If we buy into the whole OXT = love idea, OXT may turn people less prone to retaliate. But as Bosh et al. (2005) found that in rats, OXT is linked to increased maternal aggression. Researchers should dwell these hypotheses and propose experiments that test them accordingly.

This tentative list is a first attempt to encourage marketing researchers to venture this path, in the name of interdisciplinarity and also to make our discipline a more integrated and scientific rigorous field.

2.4 REFERENCES

- Bartz, J. A., Zaki, J., Bolger, N., & Ochsner, K. N. (2011). Social effects of oxytocin in humans: context and person matter. *Trends in cognitive sciences*, 15(7), 301-309.
- Bartz, J. A., Zaki, J., Bolger, N., Hollander, E., Ludwig, N. N., Kolevzon, A., & Ochsner, K. N. (2010). Oxytocin selectively improves empathic accuracy. *Psychological Science*, 21(10), 1426-1428.
- Beery, A. K. (2015). Antisocial oxytocin: complex effects on social behavior. *Current Opinion in Behavioral Sciences*, 6, 174-182.
- Berliet, M. (2013) Can You Bottle Love & Trust? An Experiment With Oxytocin Spray. **The Thought Catalog**. Available at: <http://thoughtcatalog.com/melanie-berliet/2013/08/can-you-bottle-love-trust-an-experiment-with-oxytocin-spray/>. Accessed on: July 30th, 2016.
- Bethlehem, R. A., Baron-Cohen, S., van Honk, J., Auyeung, B., & Bos, P. A. (2014). The oxytocin paradox. *Frontiers in behavioral neuroscience*, 8, 48.

- Bosch, O. J., Meddle, S. L., Beiderbeck, D. I., Douglas, A. J., & Neumann, I. D. (2005). Brain oxytocin correlates with maternal aggression: link to anxiety. *The Journal of Neuroscience*, 25(29), 6807-6815.
- De Dreu, C.K.W., Greer, L.L., Handgraaf, M.J.J., Shalvi, S., Van Kleef, G.A., Baas, M., et al., 2010. The neuropeptide oxytocin regulates parochial altruism in intergroup conflict among humans. *Science* 328, 1408—1411, doi:10.1126/science.1189047.
- Declerck, C., Boone, C., & Kiyonari, T. (2013). The effect of oxytocin on cooperation in a prisoner's dilemma depends on the social context and a person's social value orientation. *Social cognitive and affective neuroscience*, nst040.
- Dumais, K. M., & Veenema, A. H. (2016). Vasopressin and oxytocin receptor systems in the brain: sex differences and sex-specific regulation of social behavior. *Frontiers in neuroendocrinology*, 40, 1-23.
- Ellenbogen, M. A., Linnen, A. M., Grumet, R., Cardoso, C., & Joobar, R. (2012). The acute effects of intranasal oxytocin on automatic and effortful attentional shifting to emotional faces. *Psychophysiology*, 49(1), 128-137.
- Erdogan, B. Z., Baker, M. J., & Tagg, S. (2001). Selecting celebrity endorsers: The practitioner's perspective. *Journal of advertising research*, 41(3), 39-48.
- Fürst, A., Thron, J., Scheele, D., Marsh, N., & Hurlemann, R. (2015). The neuropeptide oxytocin modulates consumer brand relationships. *Scientific reports*, 5.
- Grégoire, Y., & Fisher, R. J. (2008). Customer betrayal and retaliation: when your best customers become your worst enemies. *Journal of the Academy of Marketing Science*, 36(2), 247-261.
- Grillon, C., Krinsky, M., Charney, D. R., Vytal, K., Ernst, M., & Cornwell, B. (2013). Oxytocin increases anxiety to unpredictable threat. *Molecular psychiatry*, 18(9), 958.

- Guastella, A. J., Hickie, I. B., McGuinness, M. M., Otis, M., Woods, E. A., Disinger, H. M., ... & Banati, R. B. (2013). Recommendations for the standardisation of oxytocin nasal administration and guidelines for its reporting in human research. *Psychoneuroendocrinology*, 38(5), 612-625.
- Heinrichs, M., Meinlschmidt, G., Wippich, W., Ehler, U., & Hellhammer, D. H. (2004). Selective amnesic effects of oxytocin on human memory. *Physiology & Behavior*, 83(1), 31-38.
- Huffmeijer, R., Alink, L. R., Tops, M., Bakermans-Kranenburg, M. J., & van IJzendoorn, M. H. (2012). Asymmetric frontal brain activity and parental rejection predict altruistic behavior: Moderation of oxytocin effects. *Cognitive, Affective, & Behavioral Neuroscience*, 12(2), 382-392.
- Huffmeijer, R., Alink, L. R., Tops, M., Bakermans-Kranenburg, M. J., & van IJzendoorn, M. H. (2012). Asymmetric frontal brain activity and parental rejection predict altruistic behavior: Moderation of oxytocin effects. *Cognitive, Affective, & Behavioral Neuroscience*, 12(2), 382-392.
- Israel, S., Lerer, E., Shalev, I., Uzevovsky, F., Riebold, M., Laiba, E., ... & Ebstein, R. P. (2009). The oxytocin receptor (OXTR) contributes to prosocial fund allocations in the dictator game and the social value orientations task. *PloS one*, 4(5), e5535.
- Kosfeld, M., Heinrichs, M., Zak, P. J., Fischbacher, U., & Fehr, E. (2005). Oxytocin increases trust in humans. *Nature*, 435(7042), 673-676.
- Lin, P. Y., Grewal, N. S., Morin, C., Johnson, W. D., & Zak, P. J. (2013). Oxytocin increases the influence of public service advertisements. *PloS one*, 8(2), e56934.
- Saad, G. (2007). *The Evolutionary Bases of Consumption*. Psychology Press.
- Saad, G. (2011). *The consuming instinct: What juicy burgers, Ferraris, pornography, and gift giving reveal about human nature*. Prometheus Books.

- Shalvi, S., & De Dreu, C. K. (2014). Oxytocin promotes group-serving dishonesty. *Proceedings of the National Academy of Sciences*, 111(15), 5503-5507.
- Van Anders, Sari M., James L. Goodson, and Marcy A. Kingsbury. "Beyond Oxytocin= Good": Neural Complexities and the Flipside of Social Bonds." *Archives of sexual behavior* 42.7 (2013): 1115.
- Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2012). A sniff of trust: meta-analysis of the effects of intranasal oxytocin administration on face recognition, trust to in-group, and trust to out-group. *Psychoneuroendocrinology*, 37(3), 438-443.

3 AN EXPERIMENTAL APPROACH ON THE RELATIONSHIP BETWEEN OXYTOCIN AND BRAND TRUST

3.1 INTRODUCTION

Morgan and Hunt (1994) wrote a prestigious and influential paper that is cited as part of any literature review on trust by marketing scholars, in which they define trust “as existing when one party has confidence in an exchange partner's reliability and integrity” (Morgan & Hunt, 1994, p. 23). Definitions of trust teem in consumer behavior and marketing literature, but very few of them account for trust as one out of biological adaptations. Yes, we can define trust in a myriad of ways, but many scholars in psychology, economy and neurological science are defining trust by its biological underpinnings. Marketing scholars should also consider these foundations when researching the fundamentals of trust (Fürst et al., 2015, Zak, 2011).

Consumer research should fundamentally be an interdisciplinary field (Saad 2007, 2008, 2011). Saad (2007) argues that the most important scientific projects require some form of interdisciplinary work. Other authors, such as Simonson, Carmon, Dhar, Drolet and Nowlis (2001), affirm that consumer researchers should “apply, test, and extend theories developed in other disciplines” (p. 267). Simonson et al. (2001) also state that novel research streams could have a significant impact in the field and often contribute to theory development. In addition, Saad (2008) urges consumer researchers to consider consumer behavior under the tenets of biology, using their tools to reach for more consilience, which means that consumer behavior should be part of a unified and well-integrated body of knowledge.

Human behavior in general, and consumer behavior in particular, should be understood as part of our biology (Saad 2007, 2011). In terms of our biological features, some of the most important are the hormones that affect our behaviors.

This paper aims to answer calls by Simonson et al. (2001) and Saad (2008) to extend, apply and test findings of the neurophysiological field, that is, the role of oxytocin (OXT) in trust behaviors among consumers – a research stream that has already been the subject of several studies in physiology (Ellenbogen, Linnen, Grumet & Joobar, 2012; Zak, Kurzban & Matzner, 2005) and economics (Zak, 2011). The trend seems to be catching on in consumer research and there are also at least three studies that investigate the relationship between OXT and consumer behavior (Lin et al., 2013; Alexander, Tripp & Zak, 2015; Fürst et al., 2015).

OXT is a molecule naturally found in our bodies and it is used as a medicine to induce contractions during labor and to help the production of milk during breastfeeding (Ellenbogen et al., 2012). Recently OXT has been studied in the context of economics by Zak, Stanton and Ahamadi (2007) as a hormone that enhances trust. OXT can be infused in research participants intranasally, or it can be increased naturally by facial cues, hugs or handshakes (Young & Alexander, 2012). However, as pointed out by Zak et al. (2005), the physiology of interpersonal trust is just beginning to be examined.

Trust is part of everyday life in the consumer realm. Consumers engage in trusting behaviors with vendors, firms and brands. This study will focus on brand trust, which is an important construct that, in the words of Chaudhuri and Holbrook (2001), can be translated into higher market share and price premium. If we are able to unveil the physiological reasons behind the formulation of brand trust, firms could plan their strategies accordingly.

Three separate experimental studies were performed to investigate the role of OXT and its relationship with brand trust to answer the research question: does OXT increase brand trust? Either intranasal OXT or a saline solution was administered to subjects in order to measure the effects of the dependent variable – brand trust. These experiments were double-blinded (Gould, 2001), in order to avoid the placebo effect. In addition, due to concerns involving the use of a medicine (intranasal OXT) in human subjects, both studies followed the

guidelines set forth in the Declaration of Helsinki (Saif, 2000) and had clearance of the Health Ministry via Plataforma Brasil (Brazilian online platform that controls all research involving human subjects) and the Institutional Review Board (IRB) of Fundação Getulio Vargas/EAESP.

The implications of this project are significant, for both researchers and practitioners. For researchers, this study will help to elucidate whether OXT has an effect on consumer behavior. In addition, it is a step towards more interdisciplinary work in the field and tackles one of the most important constructs, namely, brand trust (Avis, Aitken & Ferguson, 2012; Delgado-Ballester, 2004; Fournier, 1998). In the words of Heinrichs, von Dawans and Domes (2009) we are indeed searching for the molecular bases of trust. For practitioners, the study will help marketers select their strategies according to the results; if the hypotheses hold, practitioners can create policies for vendors and brands that will elicit an increase in OXT. As proposed by Ellenbogen et al. (2012), facial cues (such as a smile), handshakes or even hugs could naturally enhance OXT levels in consumers.

3.2 OXYTOCIN AND TRUST

Trust is such a big part of human life that we tend to assume that it is rooted in rational behavior: we spend a lot of time thinking about it, setting up strategies as to whom to trust in the workplace and in politics, and dread the idea that someone might deceive us. But what if trust behavior is not part of our rational life, and it instead is a behavior triggered by hormones in the brain? Researchers (Bosch, Meddle, Beiderbeck, Douglas & Neuman., 2005; Domes, Heinrichs, Michel, Berger & Herpertz, 2007; Domes et al., 2010; Ellenbogen et al., 2012; Huber, Veinante & Stoop, 2005; Kosfeld, Heinrichs, Zak, Fischbacher & Fehr, 2005; Lin et al., 2007; Zak et al., 2005; Zak, 2011) are turning to one molecule, OXT, to understand the biology of trust. OXT is a hormone that is naturally found in our bodies, but it is also

administered intranasally or intravenously in order to elicit uterine contractions during labor and to facilitate milk ejection during lactation (Ellenbogen et al., 2012).

Some earlier studies that investigated the effects of OXT on behavior aimed to help people with social anxiety and autism. However, the mitigating effects of OXT on these disorders were not entirely successful: although administration of OXT may reduce the effects of stress, the hormone is not suited to perform as an indiscriminate anxiolytic, as we have much more potent drugs that suit this goal better. OXT seems to reduce only social anxiety and makes people more prone to “liking” or “wanting” social interaction (Bethlehem et al., 2014). These effects are not invariable throughout all contexts, and in rats OXT has shown to increase levels of aggression, supposedly as a way to protect offspring (Bosch et al., 2005; Young & Alexander, 2012).

Nonetheless, OXT has proven to be an important hormone in eliciting bonding and trusting behavior. Several studies have used intranasal OXT to investigate the relationship between OXT and trust, and have indicated a positive relationship between the two variables (Baumgartner, Heinrichs, Vonlanthen, Fischbacher & Fehr, 2008; Huber et al., 2005; Kosfeld et al., 2005; Lin et al., 2007; Van Ijzendoorn & Bakermans Kranenburg, 2012; Young & Alexander, 2012; Zak et al., 2005, 2007; Zak, 2013). In the following sections, the relationship between OXT and trust will be established through three experiments proposed to attest the direction of the relationship in the consumer behavior realm.

OXT is known in lay circles as the “love hormone” (Ellenbogen et al., 2012); however, its functions are not yet fully understood by scientists, mainly because there has only recently been an increase in the number of studies concerning its role in human behavior (Van Ijzendoorn & Bakermans-Kranenburg, 2012; Young & Alexander, 2012). Young and Alexander (2012) propose that, instead of being understood as the love hormone, the best description of OXT is as “the love doorman” (Young & Alexander, 2012, p. 144).

OXT operation is best understood in terms of its relationship to motherhood. Young and Alexander (2012) suggest that OXT is the most important hormone in shaping and driving maternal behavior. They state that pregnancy and birthing modifies a woman's "internal compass," and thus turns a hysterical crying baby into an object of enchantment. As OXT is the key to understanding "why mothers mother" (Young & Alexander, 2012, p. 95), it is also the key to understanding how humans bond and come to trust one another.

Zak (2011) proposes that OXT represents central physiological evidence by which to uncover the mechanisms of pro-social behaviors, of which trust is one (the others are empathy, generosity, maternal care and sacrifice) (Huber et al., 2005; Zak, 2011). The OXT hormone is found in all mammalian animals, including humans. OXT receptors are found in the amygdala, a part of the brain that neuroscientists call the limbic system, which is associated with emotional and social processes, inferences and behaviors (Dimoka, 2010; Huber et al., 2005; Rilling et al., 2002). Highly social species have high densities of OXT receptors in the brain, and these receptors play a fundamental role in reward processing (Domes et al., 2007; Huber et al., 2005). According to Lin et al. (2007) this part of the brain does not require conscious decision-making. At the physiological level, one must attend a social stimulus before the release of OXT signals the organism to take action. In a natural situation, the signal could be a sign of distress or a request for help from offspring or peers (Lin et al., 2007). Other studies show that the release of OXT in the brain could be triggered by social bonding, through hugs, handshakes, signals of vulnerability and sexual intercourse (Young & Alexander, 2012).

Zak et al. (2005) suggest that human beings exhibit an extraordinary level of interpersonal trust, even during one-shot interactions with complete strangers. However, standard economic theory does not comply with this view. Williamson (1985), a Nobel Prize winner, states that humans exhibit opportunism in a strong form, and are capable of lying,

cheating and stealing to reach their goals. Zak et al. (2005) affirm that according to traditional theory, rational beings should not trust others in one-shot interactions, and that if someone trusts you, you should not be trustworthy in return. This means that the traditional economic man tries to reap optimal results (in terms of monetary value). However, if this were truly the case, people would never engage in any type of relationship, and getting married, selecting trading partners, and engaging in friendships would be impossible (Ridley, 2010). Of course, humans can behave selfishly when pursuing their own interests, but in social interactions, more often than not, people behave in a trustworthy manner. For example, they engage in relationships with strangers, donate their resources to foreign countries, give their seats to senior citizens on public transportation, and even donate organs to complete strangers (Zak, 2011).

The relationship between OXT and trust has been the subject of several studies (Baumgartner et al., 2008; Domes et al., 2010; Ellenbogen et al., 2012; Zak et al., 2005; Zak et al., 2007). The number of studies is such that a meta-analysis has also been conducted by Van IJzendoorn and Bakermans-Kranenburg (2012). The reason for the high volume of work in this area is that intranasal OXT induces replicable changes in brain functioning, and consequently behavior, in contrast to intravenously administered OXT, which cannot pass the blood-brain barrier. This barrier separates the circulating blood from the brain, and functions as a protective mechanism against dangerous chemicals and certain infections (Broadwell & Salzman, 1981; Reese & Karnovsky, 1967).

Van IJzendoorn and Bakermans-Kranenburg's (2012) meta-analysis suggests that studies to date posit a strong relationship between OXT levels and increasingly trusting behavior among people. Infusing people with intranasal OXT has led to changes in behaviors associated with emotional engagement, including increasing their level of accuracy in recognizing emotions in people's facial expressions (from photographs), as well as their

charitable giving and time spent looking in the eye region of people's faces – thus giving support to the popular adage “the eyes are the door to one's soul” (Lin et al., 2007).

It is important to mention that, after the meta-analysis conducted by Van IJzendoorn and Bakermans-Kranenburg's (2012), two studies contradicted the findings that OXT may have an impact on trust behavior. The first was conducted by Ebert et al. (2013). In this study, the authors found that when infusing OXT to patients with bipolar personality disorder, their level of trust decreased, rather than increased (when playing the trust game), as previous studies suggested. The authors argue that this may be due to abnormal connections inside the patients' brain. The second one was published in June 2014. In Kuypers et al. (2014) they investigated if MDMA (popularly known as ecstasy) users would show more trust and empathy in the presence of OXT or a placebo. There were no significant effects. Again, these results may be due to damages in the brain circuitry of the participants of the study done by the use of drugs. In addition to these findings, it is noteworthy to mention that, according to Mikolajczak et al. (2010) the effects of OXT on trust are context dependent, and the two studies mentioned before seem to corroborate this view.

Nonetheless, the effect of OXT in the average person remains undisputed. One example of the typical research project that deals with the relationship between OXT and trust is that by Zak et al. (2005), who conducted two studies in which participants played a game where they had the opportunity to send money provided by the experimenters to a second player. This money would be tripled, and the recipient would have the chance to return an amount between all or none of the money back to the sender.

The authors found that the senders sent a mean of nearly half the money to the recipients, who in turn reciprocated by sending back more than the original sender had sent them (a mean of 26% more). They found the OXT levels to be higher in the recipients, which suggest that OXT is associated with responding to trust signals (Zak et al., 2005).

One of the few studies to investigate the action of OXT in the marketing field is that by Lin et al. (2007), who investigated the relationship between OXT and public service announcements (PSAs) that called for charitable donations, and the impact OXT levels have on donations made by the participants of the study.

Lin et al. (2007) conducted two studies: the first used intranasal OXT, where the participants who received the hormone donated 56% more compared to those who were administered a placebo, after viewing the PSA. The second study did not use intranasal OXT, but rather measured the difference between basal levels of OXT pre-PSA and post-PSA. The researchers found that donations occurred when the participants showed an increase in their OXT level after viewing the PSA.

As Zak et al. (2005) and Lin et al. (2007) show, there have been two different approaches to OXT studies: Zak et al. (2005) measured the levels of OXT in the blood following exposure to a social stimulus whereas Lin et al. (2007) used intranasal infusion of OXT to guarantee causation. Zak et al.'s (2005) study yields a higher level of external validity compared to the Lin's et al. (2007) approach. However, in order to achieve higher internal validity and ensure that the effects shown in the study are actually a result of increased levels of OXT, the second approach, using intranasal OXT in a double-blind experiment as used by Baumgartner et al. (2008), De Dreu et al. (2010), Domes et al. (2010), Ellenbogen et al. (2012), Kosfeld et al. (2005), Lin et al. (2007) and Zak et al. (2007). In these cases, some participants are infused with intranasal OXT and some are infused with a placebo. Neither the participants nor the experimenters are aware of the contents of the intranasal infusion (hence, "double-blind") (Van IJzendoorn & Bakermans-Kranenburg, 2012; Gould, 2001; Sekaran, 2000).

Van IJzendoorn and Bakermans-Kranenburg (2012) affirm that the research stream that investigates the relationship between OXT and trust is far from being saturated.

Furthermore, researchers remain unconvinced as to whether the effects are the same across genders. Domes et al. (2010) state that OXT is known as a female hormone, which is usually administered to facilitate labor (since it induces contractions), or to stimulate the letdown reflex during breastfeeding. However, most studies using intranasal OXT have been conducted using men, and it is unclear whether the results obtained in men can be generalized to women. According to Ellenbogen et al. (2012), the reason few studies have investigated the role of OXT in women is primarily because OXT is related to contractions during labor, and thus there is a real danger of OXT inducing miscarriages in women who agree to take part in the study without knowing that they are pregnant.

One other issue involved in conducting experiments in both men and women is that the human brain (as well as that of other animals) presents sexual dimorphism of the OXT system (Domes et al., 2010; Gorki, 1985; Young & Alexander, 2012). This means that the number of OXT receptors in the brain is usually different: women show a higher density of OXT receptors than men (Young & Alexander, 2012).

Domes et al. (2010) investigated the role of OXT in both men and women and found significant differences across the genders. These results can be explained by the fact that men and women have a different number of OXT receptors in the brain, and that women's OXT receptor affinity is substantially higher (Domes et al., 2010; Young & Alexander, 2012). There are also differences in OXT effects on men and women: in men, OXT can help ejaculation and cardiovascular homeostasis. In women, OXT is involved in milk ejection and uterine contractions (Dumais & Veenema, 2015).

In sum: it is clear from this section that OXT plays a key role in building trust among humans and it can also have different effects on men versus women. But can it help to build trust between humans and brands? The next section will investigate this question.

3.2.1 Brand trust

Brands are ubiquitous symbols in modern capitalist cultures and a subject of great research interest amongst both marketing researchers and practitioners. In several studies, it has been shown that consumers do trust brands (Avis, Aitken & Ferguson, 2012; Chaudhuri & Holbrook, 2001; Delgado-Ballester, 2004; Dimoka, 2010; Fournier, 1998; Muniz & Schau 2005). Indeed, throughout our evolutionary history there has been nothing similar to brands or products sold in stores, so there is no adaptive reason why we should have evolved to trust brands¹.

Brands are in fact a byproduct of evolutionary history: they emerged from our capacity for symbolic reasoning. Nonetheless, as will be explained in the following paragraphs, we have evolved to create relationships with others – and even with possessions and imaginary figures (Avis et al. 2012; Beran, Ramirez-Serrano, Kuzyk, Fior & Nugent, 2011; Hirschman, 2010; Saad, 2011).

But how can brands elicit trust? Hirschman (2010) affirms the textbook answer to this question in reference to the fact that brands give us the ability to distinguish between products made by different sellers. Furthermore, Fournier (1998) provides an interesting explanation for why brands exist at all; she highlights the phenomenon of animism, which is “the human activity of anthropomorphizing inanimate objects” (Fournier, 1998, p. 344) and has been identified in virtually all-human societies. Children anthropomorphize from an early age: they play with their dolls and cars as if they were real people, with emotions and personalities, rather than just objects (Fournier, 1998; Pinker, 2005).

Bird-David (1999) provides an extensive literature review of the roots of animism in science. The term was developed by Edward Burnett Tylor in 1871, in his book *Primitive*

¹ Saad (2007) affirms that our environment of evolutionary adaptedness (EEA) molded our brains and our behaviors, during the Pleistocene era (between 2.6 million years to 11.7 thousand years ago). As such, we can attest for sure that human life has not been subject to any of its modern features, such as brands, agriculture, piped water, etc. Our evolution was subject to other natural and sexual pressures.

Culture, and it is one of the first concepts in anthropology. For Bird-David (1999), animism has evolved in humans as a byproduct of our social lives. Dunbar (1998, 2003) shares the same view in relation to brain size. The argument is that our social lives are inherently complicated, and require the anticipation of action and response; in other words, social life requires strategic planning. This is why animism plays a vital role during infancy and throughout our lives: interpersonal dealings are acted out beforehand using inanimate objects, as a way of preparing for real social interactions. For Bird-David (1999), our cognitive skills are socially biased. In an interesting experiment performed at a Canadian university, children between the ages of 5–16 were asked to answer a survey about the cognitive, behavioral and affective characteristics of robots. Children described the robots as having more affective responses towards them (asking for example, “Does the robot like me?”) than having behavioral and cognitive intentions (Beran et al., 2011). It is noteworthy that affective responses are more common than others, and this could easily translate into the consumer behavior realm, because as Fournier (1998) shows people consider brands as having behavioral and cognitive intentions.

Theories of animism and impression formations are often used in support of the argument that a brand can be understood as a reciprocating partner. As such, this study proposes that the brand can be both the recipient and the elicitor of trust (Delgado-Ballester, 2004; Chaudhuri & Holbrook, 2001; Fournier, 1998; Morgan & Hunt, 1994).

As established above, animism is a human universal, which is present in various forms in our everyday lives, such as children ascribing intent to robots or consumers ascribing intent to brands (Avis et al., 2012; Bird-David, 1999; Beran et al., 2011; Muniz & Schau, 2005; Fournier, 1998; Hirschman, 2001). But how is all of this related to OXT and our physiology?

Various authors (Humphrey, 1976; Dunbar, 1998, 2003) affirm that our brains evolved higher capacities, such as trust, language, culture, and symbolic reasoning, as a

means of adaptation to the complexities of living in large groups. Waal (2006) affirms that humans are animals that belong to the essentially gregarious category, which means that we have no choice but to live in groups. This is why living in confinement or solitude has been considered one of the cruelest punishments that can be inflicted on humans, besides death (Waal, 2006). This leads to the logical conclusion that humans began to create brands – which form modern cultural symbols in the same way that totems are tribal symbols (Freud, 1938) – because we evolved in a socially complex world.

Brands can assume such special positions in people's lives that Muniz and Schau (2005) went as far as to claim that the Apple Newton, a discontinued personal digital assistant (PDA) produced by Apple, assumed the characteristics of a religion. The animistic reasoning is so rooted in the Apple Newton online brand community that they have their own resurrection narratives, as if the product can be brought back from the dead. Their legacy as community members is to keep the brand alive upon its return. This is clearly another well-documented example of animism in brands. Furthermore, as the authors affirm, in our society virtually everything is branded, “including water and dirt” (Muniz & Schau, 2005, p. 10).

Delgado-Ballester (2004) proposes a definition of brand trust as: “the confident expectations of the brand's reliability and intentions in situations entailing risk to the consumer” (Delgado-Ballester, 2004, p. 574). It has also been suggested that trust involves inferences about the brand's benevolence and intention to act in the consumers' best interests (Chaudhuri and Holbrook, 2001).

We decided to use the Brand Trust Scale (BTS) created by Delgado-Ballester (2004), which is made up of two different latent variables: brand reliability and brand intentions. Brand reliability consists of the technical aspects of the brand; that is, whether the brand actually delivers what it promises. Brand intentions, on the other hand, correspond to

expectations concerning the brand; in other words, whether the brand aims to take advantage of the consumer's vulnerability. Table 1 shows the items of the BTS.

Table 1 – Brand Trust Scale

<i>Brand Reliability</i>
X1: [Brand name] is a brand that meets my expectations
X2: I feel confidence in [brand name]
X3: [Brand name] is a brand that never disappoints me
X4: [Brand name] guarantees satisfaction
<i>Brand Intentions</i>
X5: [Brand name] would be honest and sincere in addressing my concerns
X6: I could rely on [brand name] to solve the problem
X7: [Brand name] would make any effort to satisfy me
X8: [Brand name] would compensate me in some way for the problem with the [product]

Source: Delgado-Ballester (2004)

Various authors postulate that the OXT hormone helps to build social ties, and that trust is one of the “glues” that makes social life easier (Ellenbogen et al., 2012; Domes et al., 2010; Young & Alexander, 2012; Zak, 2013). With the above in mind, could it be possible that OXT plays an important role in brand trust? Could higher levels of OXT increase consumers' trustworthiness, even for brands in which they already have a high level of trust? Dimofte, Johansson and Bagozzi (2010) affirm that global brands, that are popular throughout the world, have competitive advantages in relation to other, unknown brands. In light of this, it is important to test whether OXT plays a role in brand trust. Considering the literature review thus far, it is fair to assume that OXT will play a role in brand trust levels even if the brand is completely unknown to consumers, despite the marketing efforts conducted by other, more established, brands. Verifying this is the goal of the first study proposed in the methodology section of this research.

When talking about how we could categorize brands, Saad (2007) affirms that consumer behavior can be considered with reference to the four Darwinian modules that have evolved to solve specific problems in our evolutionary history: (1) the survival module, which relates to nourishment, shelter, and protection; (2) the reproductive module, which entails

mating and sexual display; (3) the kin-selection module, which incorporates investment in one's kin, such as nurturing children and family; and (4) the reciprocation module, which relates to friendships and coalitions.

The second study that will be conducted here aims to identify a difference between product categories: Do more social brands elicit more trust, and thus, more affected by OXT? Are brands relating to the kin-selection or reciprocation modules more impacted by OXT effects than brands relating to the survival or reproductive modules?

Furthermore, as Humphrey (1976), Dunbar (1998), and Dunbar (2003) point out, social pressures shaped our brains during our evolutionary history. Young and Alexander (2012) also emphasize that OXT is critical in processing social information. The second study will test whether brands that play an important role in our social lives are more affected by the infusion of OXT compared to brands that can be perceived as more necessary and utilitarian. As mentioned above, in the case of the Newton Apple online community (Muniz & Schau, 2005), the brand played an unequivocally important role in the social lives of the consumers, being a source of making new friends, which is related to the reciprocation module (Saad, 2007). Since OXT is active during social encounters, it might be more important in social interactions than utilitarian ones.

What is the importance of improving trust for companies? Chaudhuri and Holbrook (2001) state that brands that are trusted gather more loyal consumers, which translate into brand equity for firms, in the form of higher market share and price premium. Eliciting brand trust for firms thus has huge managerial implications.

In addition to brand trust, the studies will measure whether infusing participants with OXT will have an effect on the following variables:

- a. **Price** - Participants were required to name a brand's price (from 0 to 10 BRL). The literature suggests that OXT may have an effect on the price consumers would pay for a product when they are infused with an intranasal dose of OXT (Kosfeld et al., 2005).
- b. **Attachment to brand (brand self connection)** - As mentioned above, OXT is involved in mating, pair bonding, and maternal offspring attachment, and is thus often referred to as the "love hormone" (Domes et al., 2010; Huber et al., 2005; Rilling et al., 2002; Zak et al., 2005; Zak, 2011). It is thus possible that OXT has an effect on consumers' attachment to brands; this will be measured in all of the studies. Malär, Krohmer, Hoyer & Nyffeneger (2011) affirm that brand attachment can create strong emotions and bonds that are based on intimacy and trust, while Whan Park, MacInnis, Priester, Eisingerich & Iacobucci (2010) define brand attachment as the strength of the bond connecting the brand with the self. This bond is often rich and accessible through memory. The 10 end-point scale (five items) had questions such as, "to what extent is this brand a part of your personality?" and "to what extent do you feel emotionally bonded to (this brand)?".
- c. **Brand familiarity** - To ensure the appropriateness of the stimuli used in Study 1, brand familiarity will be verified to check that the known brand is actually familiar to participants. Also, we wish to verify if OXT has any effect on the participants' familiarity with the brand. Perhaps OXT can make familiar brands even more familiar than they already are, and maybe OXT can elicit feelings of familiarity even for unknown brands, as posited by Furst et al. (2015). The 7 bipolar end-point scale presents three items such as: "I have never seen/have seen advertisements about this brand in the mass media".
- d. **Brand Passion** - As mentioned several times in this paper, OXT is related to feelings of love and attachment among people. Is it possible that this feeling could make the

leap and OXT can be related to brand passion? We used a scale available in Bruner et al, 2001. The 7 end-point scale had three items and presented the following affirmations: “My feelings toward the brand can be characterized by: passion/delight/captivation”.

We designed three different studies to examine the role of OXT on brand trust. The first study investigated whether OXT increases trust in the same way for both known and unknown brands. Well-known brands have the advantage of having good reputations with consumers, due to the market efforts made by the brands’ manufactures (Dimofte, Johansson & Bagozzi, 2010). But what if an unknown brand is able to reap the effects of more established brands by merely enhancing the OXT levels in its consumer (for instance using a smile, a handshake, or even a hug (Young & Alexander, 2012)? The hypotheses of the first study are:

H1: Oxytocin enhances brand trust.

H2: Oxytocin enhances brand trust even for unknown brands.

H3: Oxytocin enhances brand trust more for females than for males.

The second study investigated if there was an OXT effect on brand trust when the country-of-origin (COO) is disclosed. This study was inspired by the research done by Ma et al. (2014), in which the authors found that OXT increased the likeability ratings for the national flag, in opposition to other flags (of neighboring countries). As COO influences consumers’ evaluations of brands (Liu, Johnson & Johnson, 2005), it makes sense to investigate if OXT has an effect on COO brand trust. The hypothesis is:

H4: OXT increases brand trust for the national country of origin.

The third study investigated whether there is a difference in trust between brands that relate to people’s social lives (i.e. brands that involve caring or gift-giving), in comparison to

brands that are perceived as status driven. This comparison was selected in relation to our evolutionary history: the most important selective pressure that our evolved brain has undergone relates to our social lives – how we form alliances and friendships (Saad, 2007; Humprey 1976; Dunbar 1998, 2003). The hypothesis for the third study is:

H5: Oxytocin enhances brand trust more when the brand relates to human social life.

All studies measured the difference between males and females, since research has yet to reveal whether the effects are the same across the sexes (Domes et al., 2010; Van IJzendoorn & Bakermans-Kranenburg, 2012). Because women have more OXT receptors in the brain (Domes et al., 2010; Gorki, 1985; Young & Alexander, 2012), this study predicts that they will display more pronounced effects when they are infused with OXT.

3.3 METHODS

We recruited undergraduate students from Brazilian universities located in São Paulo via Facebook groups, explaining the procedures of the experiments and offering financial compensation (US\$ 13 or BRL 40). We screened out subjects that made regular use of recreational drugs (e.g. marijuana, ecstasy), antidepressants and/or antipsychotics. Regarding female participants, we made sure that they were not pregnant before taking part in the experiments. All three studies followed the Declaration of Helsinki (Saif, 2000) and had permission granted by “Plataforma Brasil”, the Brazilian IRB (Institutional Review Board), under the ministry of health, to ensure the ethical treatment of all participants. Also, the IRB of Fundação Getulio Vargas (EAESP) approved the data collection and the procedures here described.

Following the procedure described by Guastella et al. (2013) the participants completed all the necessary demographic and psychological measures before the administration of either the OXT or the placebo. After that, they received either a 24 IU

(international unit) dose of intranasal OXT (three puffs per nostril, Syntocinon Spray, Novartis Brazil) or a saline intranasal solution (placebo, also 3 puffs per nostril). Next, the participants went through a 50-minute waiting phase before being subjected to the experiment itself (Guastella et al., 2013). After the procedure the participants were debriefed and compensated for their time (US\$ 13/BRL 40).

The experiment had a double-blind design to infer whether there is a causal relationship between OXT and brand trust. The participants of both groups received a dose of intranasal OXT or a placebo (intranasal saline solution), and neither the participants nor the experimenter had access to their assigned conditions – only when the data was computed were the conditions disclosed (Gould, 2001; Sekaran, 2000), to avoid the occurrence of the placebo effect.

The placebo effect occurs when the experimenter's expectancy of the result is so biased that he/she can act in such a way as to skew the results of the experiment. For example, if the experimenter were to know whether he/she was administering the intranasal OXT or the saline solution to the participant, he/she might transmit his/her expectations to the participant via tone of voice or body language, thus also biasing the participant. As a result, bias of the experimenter towards the results can be a self-fulfilling prophecy (Gould 2001).

The placebo effect has been well documented in the medical literature. It occurs when participants receive a dose of a medicament that makes them get better or behave as expected, purely because they believe that the treatment is going to have an effect on them (in Latin, placebo means “to please”). This procedure has been used in several studies that use intranasal OXT as an independent variable (Domes et al., 2010; Ellenbogen et al., 2012; Lin et al., 2013; Van IJzendoorn & Bakermans-Kranenburg, 2012; Zak et al., 2007). In addition, the meta-analysis conducted by Van IJzendoorn & Bakermans-Kranenburg (2012) urges

researchers to conduct more double-blind experiments in order to expand and confirm the relationship between all types of trust and OXT.

The experiments themselves used safeguards against extraneous variables in order to ensure internal validity (with respect to location, temperature of the room, time of day, etc.).

The literature reviewed in the previous sections seems to point to a causal relationship between OXT and trust, even though researchers are currently unable to pinpoint exactly how this happens in human neurophysiological terms (Domes et al., 2010; Huber et al., 2005; Zak et al., 2005).

3.4 RESULTS OF STUDY 1 – KNOWN X UNKNOWN BRAND

We performed a double-blind experiment between subjects, designed (2x2). For this study we recruited 113 participants, 59 female, 54 male, mean age 31.58. Fifty-six (56) participants received the placebo intranasal infusion and 57 the oxytocin infusion.

The brand stimuli were pre-tested, using the framework designed by Bentivegna and Brito (2014), in which the authors took several steps to choose the product category, the advertisement stimulus and brand stimulus. We selected a series of brands present in the “Top of Mind” report from 2015 (Folha de São Paulo, 2015). Afterwards, we conducted an online survey (n=71) with undergraduate and graduate students from universities located in São Paulo, Brazil, that was distributed via Facebook groups. The brand was chosen by the majority of the sample (n=43, 60.6% of the sample), a popular soft drink brand, shown in

Figure 2. We designed an unknown brand to be used as the second factor in the experiment, also shown in

Figure 2. Fifty-seven (57) participants were shown the known brand and 56 participants the unknown brand. The visual ad stimuli were randomized using the Qualtrics survey software.

Figure 2 – Known vs. Unknown brand stimuli

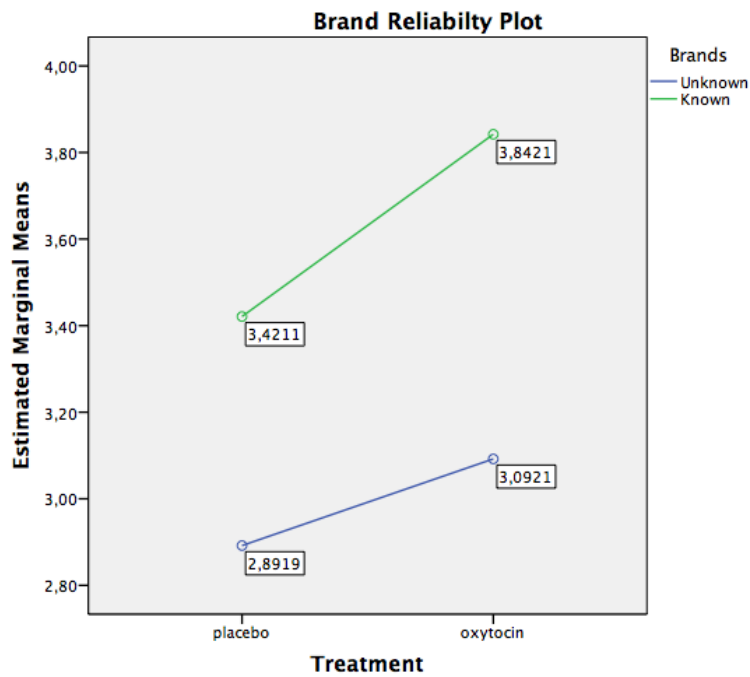


Source: The author

I performed a factorial analysis of variance (ANOVA) for the measures: price, attachment to brand, brand familiarity, brand passion, brand intentions and brand reliability. We did not find main effects for treatment in the price, brand intentions, brand passion, brand familiarity or attachment to brand measures. We found main effects at $p < 10\%$ for the placebo versus OXT treatment in the brand reliability measure ($F(3, 109) = 3.399$, $p = 0.068$) as shown in Graphic 1.

As the Graphic 1 shows, H1 and H2 are partially confirmed (because we found significant differences in only one measure): the means are lower for the placebo condition and higher for the oxytocin condition both for known and unknown brands. The p value found is in the 10% confidence interval, but this result should be taken into account together with the observed power of the test: 44.7%. Most authors (Hair et al., 2006; Hair et al., 2016) recommend that the desired power of analysis for the social sciences should be 80%. This means that, with this sample size and the effect size we can affirm that OXT yielded an effect for the brand reliability measure (effect size=0.03), even with an observed power half of what is recommended.

Graphic 1 – Brand Reliability Mean Plot

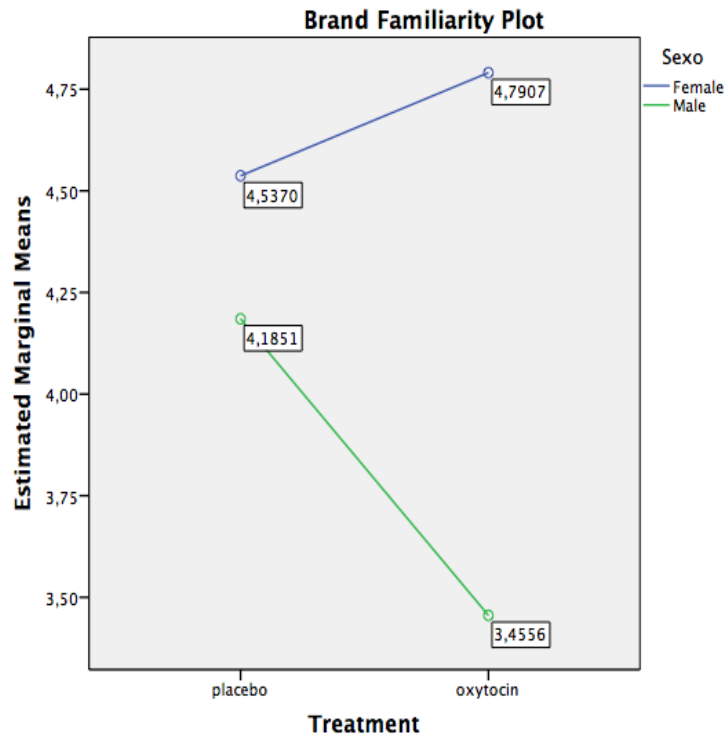


Source: The author

Regarding H3, we also found partial confirmation, as we only found effects of gender ($p < 10\%$) on one measure: brand familiarity ($F(7, 105) = 3.056, p = 0.083$), as shown in Graphic 2.

We posited that OXT would have a higher effect on women, which was confirmed. But what we did not expect was that OXT would have a decreasing effect on the brand familiarity means on men. We will discuss these puzzling results in the discussion section.

Graphic 2 – Brand Familiarity Mean Plot



Source: The author

3.5 RESULTS OF STUDY 2 – COUNTRY-OF-ORIGIN EFFECTS

The second study had a double-blind 2x2 design, comparing OXT versus placebo and country of origin effects. For this study, we conducted an online survey asking people from several graduate programs in Brazil (via the Marketing Researchers/Pesquisadores de Marketing Facebook Group) which brands they thought were signature products of the countries they know or have visited. We used the Google Forms open questionnaire template, and people were free to write their responses. The most cited product (7 of 22 product categories) was the Swiss wristwatch. We decided to use this product and compare the measures between a Brazilian wristwatch and a Swiss wristwatch. The visual stimuli used in the experiment are shown in

Figure 3.

Figure 3 – COO Ad Stimuli



Source: The author

For this study we recruited 113 participants, 59 female, 54 male, mean age 31.58. Fifty-six (56) participants received the placebo intranasal infusion and 57 the oxytocin infusion. We did not find main effects for any of the measures. At first we believed that this was due to the lack of familiarity or the size of the flags in the visual stimuli, but we performed a post-test of the visual stimuli and 62% recognized the Brazilian flag and 84% recognized the Swiss flag correctly. When performing a t-test (between subjects) there were no significant differences in the familiarity scale for the two countries. Therefore, H1a and H2b were rejected and since we cannot say that this was due to the visual stimuli, it must be due to a lack of effect of the OXT on the subjects. We will analyze these results in the discussion.

3.6 RESULTS STUDY 3 – SOCIAL X NON-SOCIAL STIMULI

For study 3, we recruited 57 participants, mean age 32.89. This study had a mixed design: within subjects (social vs. non social) and between subjects (OXT vs. placebo). Nineteen (19) participants received the placebo and 38 received the OXT. Thirty-two (32) were female and 25 male. We chose to show participants two different brand categories (beverages and accessories) because showing competitors in the same category (e.g. Pepsi vs. Coke) would add a confounding factor to the experiment. Besides, as this was a within-subject design, showing the same brand with different stimuli would produce confounding factors too.

Furthermore, Fürst et al. (2015) also used different brand categories as their stimuli in their exogenous OXT experiment.

Moreover, these brands were chosen in a pretest (n=71) asking participants (graduate students recruited via Facebook groups) which brand they identified as being related to family and friends (Coke= 44%) and which brands were related to status and searching for a mate (Rolex= 61%). Thus, the stimuli (social and non-social) are shown in Figure 4.

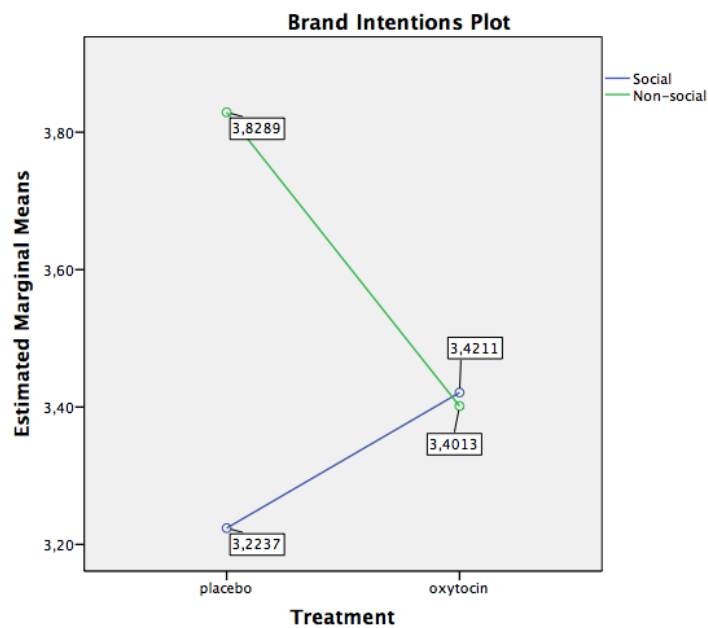
Figure 4 – Social vs. Non-social stimuli



Source: The author

We did not find significant main effects for price, attachment to brand and brand passion with no moderating effect of gender. For brand intentions, we found interaction at $p < 5\%$ $F(1, 57) = 4.501$, $p = .038$ and main effects at the $p < 5\%$, $F(1, 57) = 3.95$, $p = .052$ and between the social and non-social stimuli as shown in Graphic 3. There was no moderating effect of gender (factorial Anova).

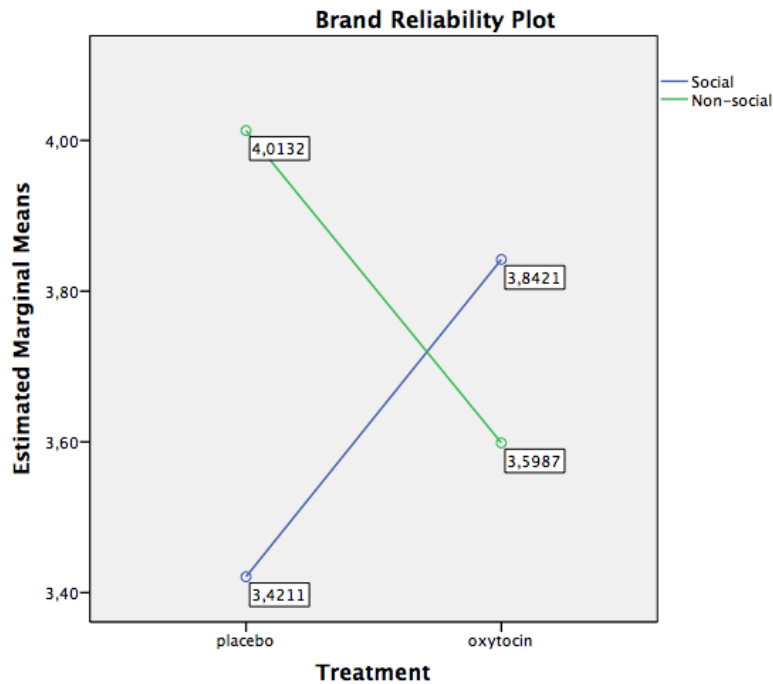
Graphic 3 – Brand Intentions Mean Plot



Source: The author

In Graphic 4 we show that there is also a significant difference at $p < 1\%$ (interaction) between the social and the non-social stimuli ($F(1, 55) = 6.866$, $p = 0.011$) for the brand reliability measure. As such, we can partially confirm H5, as we found differences between the placebo and OXT stimuli within the participants: for the social stimulus, OXT increased the means, but it had the opposite effect on non-social stimuli (for both brand trust scales: brand intentions and reliability). We will discuss these results in the next session. The factorial Anova showed that there was no moderating effect of gender.

Graphic 4 – Brand Reliability Mean Plot



Source: The author

3.7 DISCUSSION

In the three studies I tried to test if there was a causal relationship between OXT and brand trust. The first one dealt with the impact of OXT in both known and unknown brands. Even though I did not find main effects for all measures, I found that OXT increases the means in the brand reliability scale, both for known and unknown brands, partially confirming H1. These results add to, in the words of Osnat Harari-Dahan (2014), “the robust effects of OXT on a wide range of social behaviors”. Adding to the work of Fürst et al. (2015), which shows that OXT has an effect on brands personally relevant to participants, my work shows that OXT also has an effect on brands, broadly speaking: the brand could be either weak (unknown) or strong (known) to the public and both of them could reap the effects of increasing OXT in the consumers. This could be done, as mentioned before, by vendors showing friendly gestures and faces, or by hugs and handshakes. This type of stimuli is researched in psychology and neurology, but we still have to investigate if OXT levels

increase (via salivary OXT measurements) in the presence of these stimuli in the consumer behavior setting (Aaker, 2001; Osnat Harari-Dahan, 2014; Bethlehem et al., 2014; Domes et al., 2007). Future research should go in this direction also to help practitioners: it is neither ethical nor practical to infuse consumers with OXT in hopes that they will trust your brand more.

In the first study I also found that OXT had different effects on women and men regarding brand familiarity: OXT increases the means for women whereas it decreases the means for men. One must remember that humans are a sexually dimorphic species (Saad, 2007): men and women evolved different adaptations to different environmental and sexual pressures. Dumais and Veenema (2015) state that in women OXT regulates maternal contractions and milk ejection. In men, OXT is involved in ejaculation and cardiovascular homeostasis (the regulation of an organism's normal parameters). It makes sense that OXT has different behavioral outcomes as well. I cannot confirm it, but future research could deal with the infusion of OXT in consumer situations combined with neuroimaging to attest if men and women are using different parts of the brain when making consumer decisions. In some animals (voles, rats, mice and hamsters), manipulation of OXT in the neonatal stage causes different behavioral responses, such as mate guarding, alloparental care and social approach. It has been postulated that women have more OXT receptors in the brain, but this is yet to be confirmed in humans (Dumais & Veenema, 2015). But why should men disclose a lower level of familiarity with brands than women? Bethlehem et al. (2014) suggest that OXT does not have invariant effects across contexts and individuals. The authors urge researchers to debunk the myth that OXT equals love. In this study men were more prone to disclose their unfamiliarity with a brand, suggesting OXT does have more affinity with the female sex, and in this case it had an opposite effect on men. Future research should focus on this topic, because I am suggesting a natural way to increase OXT level in people is through handshakes

and hugs, however men could misinterpret these signals as sexual intent, causing not an increase in OXT but in other gonadal hormones such as testosterone (Haselton, 2003).

The second study did not entail any differences for the effects of country-of-origin (COO). The study was inspired by Ma et al. (2014), in which the authors found that OXT increased the likeability ratings for the national flag, in opposition to other flags, however I could not replicate their findings in COO effects. Future research could dwell on cultural differences, because our study sampled Brazilian subjects and Ma et al. (2014) studied Chinese subjects. Comparing different cultures could give us more insight as for the reasons some samples show more likeability to their country's flags in opposition to other flags or COO.

The third study was based on evolutionary theory: as OXT is posited to increase social cognition (Bethlehem et al., 2014), I compared two brand stimuli, one relating to the kinship and reciprocation module (Saad, 2007) and the other relating to the sexual module (Saad, 2007). As expected, brand trust increased for both measures: brand intentions and brand reliability. For practitioners this is a relevant finding: brands relating to care, family and social gathering situations can increase brand trust if they can elicit consumers' OXT levels. Fürst et al. (2015) did exactly this by measuring salivary levels of OXT pairing brands to the names of their closest friends, increasing levels of satisfaction, self-connection and trust. Our study confirmed the causal relationship between OXT and social stimuli, and practitioners could reap these effects using the framework done by Fürst et al. (2014) and this paper, pairing the brands with people or situations that connect emotionally to the consumers.

What I did not expect was the OXT treatment decreasing the means for the non-social brand. The means were lower than the placebo condition both for brand reliability and brand intentions. I hypothesize that this happened because of the threatening eye gaze of the celebrity endorser: Bethlehem et al. (2014) believes that OXT makes people more aware of

social cues, and eyes are one way to predict one's intention. As OXT makes people more perceptive of the eye region (Ellenbogen et al., 2012), our stimulus could have made people more aware of the threatening gaze and lowered the means for the OXT condition. Future research should investigate if different facial expressions present the same results when paired with OXT infusion.

In sum, OXT causes differences in trust for brands as previous literature had found for economic games. But the results are not uniform, nor invariable in all contexts: paired with social stimuli, OXT has the predicting effect of increasing brand trust, both for known and unknown brands. But even known brands paired with celebrities signaling sex intent or status have different results when one infuses participants with OXT: the means for brand trust decrease. Thus, OXT is not a panacea that practitioners could spray through stores and magically reap bigger sales. Considering the complexities of the human brain, it would be surprising if I had found such magic pill. Instead, by understanding the role OXT plays in the consumer behavior setting we get one step closer to understanding human behavior more deeply.

3.8 REFERENCES

- Aaker, D. A. (2001) Building Strong Brands. *Social Marketing Quarterly*, v. 7, n 2, p. 36-40.
- Alexander, V., Tripp, S., & Zak, P. J. (2015). Preliminary Evidence for the Neurophysiologic Effects of Online: Changes in Oxytocin, Stress, and Mood. *Psychology & Marketing*, 32(9), 977-986.
- Avis, M., Aitken, R., & Ferguson, S. (2012). Brand relationship and personality theory metaphor or consumer perceptual reality?. *Marketing Theory*, 12(3), 311-331.

- Baumgartner, T., Heinrichs, M., Vonlanthen, A., Fischbacher, U., & Fehr, E. (2008). Oxytocin shapes the neural circuitry of trust and trust adaptation in humans. *Neuron*, 58(4), 639-650.
- Bentivegna, R.J., Brito, E.P.Z. (2014). Regional Cultures and the Effectiveness of Rational and Emotional Brand Advertising. Working Paper. Fundação Getúlio Vargas (FGV-EAESP/Brazil).
- Beran, T. N., Ramirez-Serrano, A., Kuzyk, R., Fior, M., & Nugent, S. (2011). Understanding how children understand robots: Perceived animism in child–robot interaction. *International Journal of Human-Computer Studies*, 69(7), 539-550.
- Bethlehem, R. A., Baron-Cohen, S., van Honk, J., Auyeung, B., & Bos, P. A. (2015). The oxytocin paradox. *Oxytocin's routes in social behavior: into the 21st century. "Precision Medicine" approach for Oxytocin*, 116.
- Bilkey, W. J., & Nes, E. (1982). Country-of-origin effects on product evaluations. *Journal of international business studies*, 13(1), 89-100.
- Bird-David, N. (1999). "Animism" revisited: personhood, environment, and relational epistemology 1. *Current Anthropology*, 40(S1), S67-S91.
- Bosch, O. J., Meddle, S. L., Beiderbeck, D. I., Douglas, A. J., & Neumann, I. D. (2005). Brain oxytocin correlates with maternal aggression: link to anxiety. *The Journal of Neuroscience*, 25(29), 6807-6815.
- Broadwell, R. D., & Salcman, M. (1981). Expanding the definition of the blood-brain barrier to protein. *Proceedings of the National Academy of Sciences*, 78(12), 7820-7824.
- Bruner, G. C., Hensel, P. J., & James, K. E. (2001). *Marketing Scales Handbook*. Chicago: American Marketing Association.
- Bruner, G. C., Hensel, P. J., & James, K. E. (2013). *Marketing Scales Handbook*. Fort Worth, Texas: GCBII Productions, LLC.

- Chaudhuri, A., & Holbrook, M. B. (2001). The chain of effects from brand trust and brand affect to brand performance: the role of brand loyalty. *Journal of Marketing*, 65(2), 81-93.
- De Dreu, C. K., Greer, L. L., Handgraaf, M. J., Shalvi, S., Van Kleef, G. A., Baas, M., ... & Feith, S. W. (2010). The neuropeptide oxytocin regulates parochial altruism in intergroup conflict among humans. *Science*, 328(5984), 1408-1411.
- Delgado-Ballester, E. (2004). Applicability of a brand trust scale across product categories: a multigroup invariance analysis. *European Journal of Marketing*, 38(5/6), 573-592.
- Dimofte, C. V., Johansson, J. K., & Bagozzi, R. P. (2010). Global brands in the United States: How consumer ethnicity mediates the global brand effect. *Journal of International Marketing*, 18(3), 81-106.
- Dimoka, A. (2010). What does the brain tell us about trust and distrust? Evidence from a functional neuroimaging study. *MIS Quarterly*, 34(2).
- Domes, G., Heinrichs, M., Michel, A., Berger, C., & Herpertz, S. C. (2007). Oxytocin improves “mind-reading” in humans. *Biological Psychiatry*, 61(6), 731-733.
- Domes, G., Lischke, A., Berger, C., Grossmann, A., Hauenstein, K., Heinrichs, M., & Herpertz, S. C. (2010). Effects of intranasal oxytocin on emotional face processing in women. *Psychoneuroendocrinology*, 35, 83–93. doi: 10.1016/j.psyneuen.2009.06.016
- Dumais, K. M., & Veenema, A. H. (2015). Vasopressin and oxytocin receptor systems in the brain: Sex differences. *neuropeptides*, 3, 3.
- Dunbar, R. I. (1998). The social brain hypothesis. *Brain*, 9(10), 178-190.
- Dunbar, R. I. (2003). The social brain: mind, language, and society in evolutionary perspective. *Annual Review of Anthropology*, 163-181.

- Ebert, A., Kolb, M., Heller, J., Edel, M. A., Roser, P., & Brüne, M. (2013). Modulation of interpersonal trust in borderline personality disorder by intranasal oxytocin and childhood trauma. *Social neuroscience*, 8(4), 305-313.
- Ellenbogen, M. A., Linnen, A. M., Grumet, R., Cardoso, C., & Joobar, R. (2012). The acute effects of intranasal oxytocin on automatic and effortful attentional shifting to emotional faces. *Psychophysiology*, 49(1), 128-137.
- Elliott, G. R., & Cameron, R. C. (1994). Consumer perception of product quality and the country-of-origin effect. *Journal of international Marketing*, 49-62.
- Erdfelder, E., Faul, F., & Buchner, A. (1996). GPOWER: A general power analysis program. *Behavior Research Methods, Instruments, & Computers*, 28, 1-11.
- Folha de São Paulo (2015). Top of Mind. Available at: <http://www1.folha.uol.com.br/especial/2015/top-of-mind/>. Accessed on: 28/05/2016.
- Fournier, S. (1998). Consumers and their brands: developing relationship theory in consumer research. *Journal of Consumer Research*, 24(4), 343-353.
- Freud, S. (1938). *Totem and Taboo*. Pelican Books.
- Fürst, A., Thron, J., Scheele, D., Marsh, N., & Hurlemann, R. (2015). The neuropeptide oxytocin modulates consumer brand relationships. *Scientific reports*, 5.
- Gorski, R. A. (1985). Sexual dimorphisms of the brain. *Journal of Animal Science*, 61(Supplement 3), 38-61.
- Gould, J. E. (2001). *Concise Handbook of Experimental Methods for the Behavioral and Biological Sciences*. CRC Press.
- Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage Publications.
- Hair, J. F., Tatham, R. L., Anderson, R. E., & Black, W. (2006). *Multivariate Data Analysis* (Vol. 6). Upper Saddle River, NJ: Pearson Prentice Hall.

- Harari-Dahan, O., & Bernstein, A. (2014). A general approach-avoidance hypothesis of oxytocin: accounting for social and non-social effects of oxytocin. *Neuroscience & Biobehavioral Reviews*, 47, 506-519.
- Heinrichs, M., von Dawans, B., & Domes, G. (2009). Oxytocin, vasopressin, and human social behavior. *Frontiers in neuroendocrinology*, 30(4), 548-557.
- Hirschman, E. C. (2010). Evolutionary branding. *Psychology & Marketing*, 27(6), 568-583.
- Huber, D., Veinante, P., & Stoop, R. (2005). Vasopressin and oxytocin excite distinct neuronal populations in the central amygdala. *Science*, 308(5719), 245-248.
- Humphrey, N. K. (1976). The social function of intellect. *Growing points in ethology*, 303-317.
- John, O. P., Donahue, E. M., & Kentle, R. L. (1991). *The Big Five Inventory – Versions 4a and 54*. Berkeley, CA: University of California, Berkeley, Institute of Personality and Social Research.
- John, O. P., Naumann, L. P., & Soto, C. J. (2008). Paradigm shift to the integrative Big Five trait taxonomy: History, measurement, and conceptual issues. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of Personality: Theory and research* (pp. 114-158). New York, NY: Guilford Press.
- Koch, S. B., van Zuiden, M., Nawijn, L., Frijling, J. L., Veltman, D. J., & Olff, M. (2015). Intranasal Oxytocin Administration Dampens Amygdala Reactivity Towards Emotional Faces in Male and Female PTSD Patients. *Neuropsychopharmacology*.
- Kosfeld, M., Heinrichs, M., Zak, P. J., Fischbacher, U., & Fehr, E. (2005). Oxytocin increases trust in humans. *Nature*, 435(7042), 673-676.
- Kuypers, K. P., de la Torre, R., Farre, M., Yubero-Lahoz, S., Dziobek, I., Van den Bos, W., & Ramaekers, J. G. (2014). No Evidence that MDMA-Induced Enhancement of

- Emotional Empathy Is Related to Peripheral Oxytocin Levels or 5-HT1a Receptor Activation. *PloS one*, 9(6), e100719.
- Lin, P. Y., Grewal, N. S., Morin, C., Johnson, W. D., & Zak, P. J. (2013). Oxytocin increases the influence of public service advertisements. *PloS one*, 8(2), e56934.
- Liu, S. S., Johnson, K. F., & Johnson, K. F. (2005). The automatic country-of-origin effects on brand judgments. *Journal of Advertising*, 34(1), 87-97.
- Ma, X., Luo, L., Geng, Y., Zhao, W., Zhang, Q., & Kendrick, K. M. (2014). Oxytocin increases liking for a country's people and national flag but not for other cultural symbols or consumer products. *Frontiers in behavioral neuroscience*, 8.
- Malär, L., Krohmer, H., Hoyer, W. D., & Nyffenegger, B. (2011). Emotional brand attachment and brand personality: the relative importance of the actual and the ideal self. *Journal of Marketing*, 75(4), 35-52.
- Mikolajczak, M., Gross, J. J., Lane, A., Corneille, O., de Timary, P., & Luminet, O. (2010). Oxytocin makes people trusting, not gullible. *Psychological Science*, 21(8), 1072-1074.
- Morgan, R. M., & Hunt, S. D. (1994). The commitment-trust theory of relationship marketing. *Journal of marketing*, 58(3).
- Mr. Clean. (2014, February 28). Retrieved from: https://www.mrclean.ca/en_CA/home.do.
- Muniz Jr, A. M., & Schau, H. J. (2005). Religiosity in the abandoned Apple Newton brand community. *Journal of Consumer Research*, 31(4), 737-747.
- Pinker, S. (2005). *The Blank Slate*. Southern Utah University.
- Reese, T. S., & Karnovsky, M. J. (1967). Fine structural localization of a blood-brain barrier to exogenous peroxidase. *The Journal of Cell Biology*, 34(1), 207-217.
- Ridley, M. (2010). *The Rational Optimist: How Prosperity Evolves*. New York, NY: HarperCollins Publishers.

- Rilling, J. K., Gutman, D. A., Zeh, T. R., Pagnoni, G., Berns, G. S., & Kilts, C. D. (2002). A neural basis for social cooperation. *Neuron*, 35(2), 395-405.
- Saad, G. (2007). *The Evolutionary Bases of Consumption*. Psychology Press.
- Saad, G. (2008). The collective amnesia of marketing scholars regarding consumers' biological and evolutionary roots. *Marketing Theory*, 8(4), 425-448.
- Saad, G. (2011). *The Consuming Instinct: What juicy burgers, Ferraris, pornography, and gift giving reveal about human nature*. Prometheus Books.
- Saif, M. (2000). World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. *Jama*, 284, 3043-3045.
- Sekaran, U. (2000). *Research Methods for Business: a skill-building approach*. 3rd ed. New York: John Wiley.
- Simonson, I., Carmon, Z., Dhar, R., Drolet, A. & Nowlis, S. (2001). Consumer research: in search of identity. *Annual Review of Psychology* 52, 249.
- Stenstrom, E., Saad, G., Nepomuceno, M. V., & Mendenhall, Z. (2011). Testosterone and domain-specific risk: Digit ratios (2D: 4D and $\frac{2D}{4D}$) as predictors of recreational, financial, and social risk-taking behaviors. *Personality and Individual Differences*, 51(4), 412-416.
- Uvnäs-Moberg, K. (1998). Oxytocin may mediate the benefits of positive social interaction and emotions. *Psychoneuroendocrinology*, 23(8), 819-835.
- Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2012). A sniff of trust: meta-analysis of the effects of intranasal oxytocin administration on face recognition, trust to in-group, and trust to out-group. *Psychoneuroendocrinology*, 37(3), 438-443.
- Verlegh, P. W., & Steenkamp, J. B. E. (1999). A review and meta-analysis of country-of-origin research. *Journal of economic psychology*, 20(5), 521-546.

- Voss, K. E., Spangenberg, E. R., & Grohmann, B. (2003). Measuring the hedonic and utilitarian dimensions of consumer attitude. *Journal of Marketing Research*, 40(3), 310-320.
- Waal, F. B. (2006). *Our Inner Ape: A leading primatologist explains why we are who we are*. Penguin.
- Whan Park, C., MacInnis, D. J., Priester, J., Eisingerich, A. B., & Iacobucci, D. (2010). Brand attachment and brand attitude strength: conceptual and empirical differentiation of two critical brand equity drivers. *Journal of Marketing*, 74(6), 1-17.
- Williamson, O. E. (1985). *The Economic Institutions of Capitalism: Firms, Marketing and Relational Contracting*. New York: The Free Press.
- Yoo, B., Donthu, N., & Lee, S. (2000). An examination of selected marketing mix elements and brand equity. *Journal of the Academy of Marketing Science*, 28(2), 195-211.
- Young, L., & Alexander, B. (2012). *The Chemistry between us: love, sex, and the science of attraction*. Penguin.
- Zak, P. J. (2011). The physiology of moral sentiments. *Journal of Economic Behavior & Organization*, 77(1), 53-65.
- Zak, P. J. (2013). *The Moral Molecule: The New Science of what Makes Us Good Or Evil*. Random House.
- Zak, P. J., Kurzban, R., & Matzner, W. T. (2005). Oxytocin is associated with human trustworthiness. *Hormones and Behavior*, 48(5), 522-527.
- Zak, P. J., Stanton, A. A., Ahmadi, S. (2007). Oxytocin increases generosity in humans. *PLoS ONE*, 2(11): e1128. doi:10.1371/journal.pone.0001128

4 SEX DIFFERENCES IN RETALIATORY BEHAVIORS: A COMPARISON BETWEEN BIOLOGICAL SEX AND GENDER SCHEMA THEORY

4.1 INTRODUCTION

According to “The Washington Post” (Noak, 2015), Sweden is adding a genderless pronoun (“hen”) to its vocabulary. The idea behind this rationale is that gender “is (...) irrelevant” in the words of a Swedish language expert.

But is this really true? Is gender really irrelevant to human life? In this paper I try to compare two competing theories and worldviews in the consumer behavior realm: gender, the idea that, short of one’s genitalia, there are no differences between men and women (Saad, 2007) and sex, in the biological sense, deriving from evolutionary theory (Darwin, 1888). Darwin (1888) proposed that differences between the sexes could be assessed by differences in body features and behavior alike. In this paper, I compare if there are differences in retaliatory behaviors when one focuses on biological sex in comparison to gender.

Customer retaliation is meant to punish a firm for perceived grievances (Grégoire & Fisher, 2006, 2008; Kähr, Nyffenegger, Krohmer, & Hoyer, 2016), a topic of much practical importance, although understudied in marketing journals (Grégoire & Fisher, 2006, 2008; Kähr et al., 2016). Customer advocacy websites and online protection agencies are the usual outlets for retaliation from dissatisfied customers. The economic impact of dissatisfied customers is quite substantial: a one-star increase in yelp.com ratings leads to a 5 to 9% increase in revenue (Luca, 2011). In sum, it is of the utmost importance for firms to understand if there are sex or gender differences in retaliatory behaviors, as this difference could influence financial success or failure. In the next sessions I will delineate differences between theories for biological sex and gender, followed by an explanation on theories on retaliation in consumer behavior.

4.2 SEX AND GENDER DIFFERENCES IN CONSUMER BEHAVIOR

What is the difference between sex and gender? In this paper, I address issues of retaliation, comparing the role of sex (biological sexes) and gender (the notion that one can address/choose their own gender as seen fit). To clarify, as posited by Palan (2001), sex refers to an individual's biological sex (male or female), as opposed to gender, which is defined as the psychological features associated with biological sex, which are socially constructed. Palan (2001) affirms that gender and sex were thought to be inseparable, but since Bem's (1981) gender schema theory, researchers and psychologists from all over the globe have treated them as two separate constructs.

Thompson and Üstüner (2015) and Butler (2011) affirm that gender roles are assessed by individuals as a performance, as an actor would when playing roles. To measure gender, I used the Bem Sex-Role Inventory (BSRI). Bem (1974, 1981) developed the BSRI as a measure of gender-role perceptions (Holt & Ellis, 1998), which translates as expectations of the typical response behavior for each sex or, in other words, as a sense of the individual's maleness or femaleness (Palan, 2001). This theory suggests that gender role is an individual response to socialization patterns (Butler, 2011; Thompson & Üstüner, 2015; Palan, 2001). Early on in childhood one can learn that typical male behavioral responses are more agentic and typical female responses are more communal. This learning process induces children to behave appropriately to each gender, as they identify themselves during development (Archer, 2004).

Bem (1981) and Holt and Ellis (1998) define four types of genders, which they call gender schema: (1) androgynous, (2) undifferentiated, (3) cross-sexed typed and (4) traditionally sex-typed.

1. Androgynous individuals are high (above the sample median) on both masculinity and femininity scales. They also could be more adaptable to modern living, because they

could adjust according to different types of situations that require different gender responses.

2. Undifferentiated individuals are low (below the sample median) on both femininity and masculinity. They tend to be less adaptable so as to not know how to behave in different situations requiring gender responses.
3. Cross-sex typed individuals score high (above the median) with the opposite gender and low on their biological sex: males that score higher on femininity and low on masculinity and vice-versa.
4. Traditionally sex-typed individuals score high (above the median) on their biological sex and lower on the opposite, i.e. females that score high on femininity and low on masculinity and vice-versa.

In opposition to the socialization epistemology, sex can be understood within a biological framework. Saad (2007, 2008) advocates that all consumption phenomena can be understood under the tenets of Darwinian evolution. If one were to analyze consumer behavior it would be advisable to arrange it under one of the four Darwinian modules: survival, reproductive, kinship, and reciprocity.

Sexual differences are understood under the reproductive module. The most influential theoretical model to explain sexual differences is the parental investment model (Saad, 2007; Trivers, 1972). The model proposes that the sex that bears the most costs is the going to choose their partners, the other is going to be chosen. This happens because, for example, in humans, women bear the costs of a nine-month pregnancy added to at least two years of breastfeeding (in hunter-gatherers societies) and other costs regarding childcare until the offspring reaches adulthood. For men, the cost could be reduced to a minimum, thus a drop of sperm (Trivers, 1972). Or, in Saad's (2007) words:

Men produce hundreds of millions of spermatozoa per day whereas women ovulate at most 400 times between the onset of menarche and the start of menopause. (...) This inequality in the importance of the male and female gametes drives the differential behaviors of the two sexes (Saad, 2007, p. 10).

Palan (2001) affirms that children start differentiating their biological sex as early as two years of age, but their (the biological sex) adaptations show much earlier than that. All men and women show a wide range of behaviors that are sex-specific, or as the biologists call them, adaptations (Saad, 2007, 2008). An adaptation, in evolutionary terms, is a feature of the body or mind that helps an individual's survival. Parental care is, of course, an adaptation, as it helps both the parent and offspring to spread their genes.

One example that can be used as inherited sex differences between the sexes is toy preferences. Saad (2007) affirms that sex differences in toy preferences do not exist due to differences in upbringing. Social constructivists have long defended this view, with little scientific support. Saad (2007) states that toy preferences such as dolls for girls and cars for boys stem from evolutionary-based differences congruent with adaptations to human environment. From a young age (before socialization entails) girls show preference for faces due to their emphatic nature whereas boys show preference for moving objects, an adaptation to their necessity for spatial decoding. These behaviors occur in as early as 1 month of age, i.e. during the presocialization stage. Also, it is hard to argue with the findings when the same preferences are showed in other species, such as vervet monkeys. Their behaviors are most certainly not due to socialization and culture (Saad, 2007).

Regarding the socialization framework, Palan (2001) advocates that gender identity findings have been rare in consumer behavior research. Biological sex is usually a moderator commonly used in many studies, but sex or gender are rarely the main goal of the investigation. Between 1963 and 2001 he found only 31 studies assessing the differences in behavior that associated biological sex and gender role as their main object of investigation. As a major finding, Palan (2001) states that biological sex is often significant when assessing

the differences in consumer behaviors, whereas gender was not. This paper is positioned to fill this gap: an investigation comparing the role of sex and gender in retaliatory behaviors. I am not aware of any paper investigating these differences so far. In this paper, I deal with these differences according to the underlying epistemological differences: I differentiate the origin of sex-differences in aggression according to biological roots or according to socialization theories, which was dealt in this segment as the gender role. The next session will review the literature of what was previously described, until now, on the sex differences in aggression and retaliation (a form of indirect aggression).

4.2.1 Sex differences in aggression and retaliatory behaviors

In his HBO Special “Never Scared”, the comedian Chris Rock affirms: “If women ruled the world, there would be no wars...just a bunch of countries not talking to each other” (Rock & Gallen, 2004). There may be scientific truth to the American comedian’s wit.

McAndrew (2014), Hess and Hagen (2006), and others affirm that, in the literature on aggression, one can find that men are more prone to direct physical aggression, whereas women use other tactics, called indirect aggression, which includes gossip and social exclusion (the literature alternatively uses relational or social aggression). Archer (2004) affirms that sex differences in aggression have been reported, in psychology journals, since the 1920’s. As previously mentioned, there are two forms of aggression: direct and indirect. Direct aggression is usually described as physical altercation. Indirect aggression uses tactics other than physical aggression, such as: forms of exclusion, bad mouthing the opponent, gossip and ostracism (Archer, 2004; Hess and Hagen, 2006; McAndrew, 2014).

As seen in the previous segment, there are two competing and different theories as to why there are sex/gender differences: evolutionary and socialization. The first describes aggression in evolutionary terms and its value for human evolution.

For evolutionary theory, sex differences in aggression patterns are a result of selection patterns in our environments. The roots of these behavioral differences are listed in the paternity investment model, showed in the last section. Because paternal care is not as important nor as pervasive in our species and women bare most of the costs of childcare, females cannot afford the risks of direct physical altercation, so evolution adapted the women's behavior into low-cost forms of aggression: gossip and social exclusion (Hess & Hagen, 2006; McAndrew, 2014; Saad, 2007; Trivers, 1972).

Following this reasoning one can conclude that women may often use gossip as a form of aggression. McAndrew (2014) affirms that gossip is a low cost form of punishment, in comparison to direct physical altercation, and it can be used as a deterrent for deviance or to enforce cooperation.

McAndrew (2014) also argues that women are more likely than men to engage in malicious, aggressive gossip as a means to ostracize rivals, a sex difference that appears as early as the age of six. De Waal (2006) affirms that when asked how long they could be angry with a person, men responded periods such as one week, two months, or a year. Women, however, women said that they could be angry with the person forever. One can conclude that men and women are different at their indirect aggression patterns.

These behaviors patterns are so ubiquitous that when afflicted with persecutory delusions women "see" familiar faces and feel afraid of being the subject of malicious gossip, though men fear unfamiliar faces that supposedly are threatening them with physical attacks (McAndrew, 2014).

Hess and Hagen (2006) investigated sex-differences in aggression patterns using an evolutionary model. They found that women are more prone than men to use indirect aggression. In this case, women attack an opponent with negative information as a strategy for retaliation. This finding holds even when the researchers control for social norms and

approval. They investigated students from an American university, which showed that the evolutionary model still holds for western modern societies.

But, as mentioned before, there is a competing theory for why people show differences in aggression patterns: socialization. Archer (2004) states that according to socialization theories, aggression is a learned pattern: young boys observe that their older male counterparts are more physically aggressive, whereas women are more restrained. These behaviors can only increase with age as boys learn that to avoid physical altercations is unmanly.

Archer (2004) suggests that these differences in aggression may be due to our structure as a patriarchal society: men hold higher status positions. The maintenance of higher status could lead to more aggressive behavior. As such, according to this theory, individuals who demonstrate higher scores in the BRSI-Male should behave more aggressively in both direct and indirect aggression. Kähr, Nyffenegger, Krohmer, & Hoyer (2016) also attest that the male gender should be more prone to engage in retaliatory behaviors, but their study did not find this difference.

In this paper, I chose the Bem Sex-Role Inventory (BSRI) as a measure of socialization in sex differences. For Bem (1974), the BSRI was built to find the conception that a person has internalized the views of which behaviors are desirable for both men and women, according to society's standards. For Pedhazur and Tetenbaum (1979), Bem was studying the desirability of masculine and feminine traits, which is consistent with socialization theories of sex differences.

What is the importance of these findings for consumer behavior research? I posit that retaliation against firms is a form of indirect aggression, as people cannot fight physically with service providers, or they would be in danger of incarceration or at least judicial claims.

One can ask if these patterns (evolutionary vs. socialization) in retaliation and indirect aggression hold when I investigate retaliatory behaviors against commercial partners. Will these sex/ gender differences show in a firm-consumer relationship? There is a growing body of literature emphasizing gender as a performance (Thompson and Üstüner, 2015; Butler, 2011), and practitioners can be interest to find out if gender or sex is a better measure for differences in behavior. Our literature review suggests a confirmation of the evolutionary model, for Archer (2004) has shown in a meta-analytic review of sex-differences in aggression that men show prominence of physical aggression, whereas women are more prone to indirect aggression. These findings seem to hold across different cultures, as proposed by evolutionary theories of human behavior.

In this paper, I try to understand if faced with service failures against them and/or their children, which sex will be more prone to retaliate, testing the first hypothesis:

H1: Women are more prone to retaliate than men, when facing costs to them and their offspring.

I predict that, according to the evolutionary model, financial costs to their families will inflict higher desire to retaliate, for both men and women (with higher means for women).

Regarding the gender schema and the biological sex, I propose that (as the evolutionary literature also supports) biological sex is a better predictor of the desire to retaliate than the gender schema theory. To the best of our knowledge, there is no study that compares differences between biological sex and gender schema in retaliatory behaviors.

H2: Biological sex is a better measure of the desire to retaliate than gender schema theory.

4.3 METHODS

I conducted an online experiment using an online panel provided by Qualtrics (2014). Using a scenario-based vignette (Rungtusanatham, Wallin & Eckerd, 2011), I tested if there were any differences between biological sex and gender schema theory in retaliatory behaviors.

I conducted the study using a $2(\text{strength of the relationship}) \times 2(\text{failure severity})$ design: it involved a vignette in which the participant made an investment in their bank to their newborn baby, and suggested a strong or weak relationship with the service provider (number of products with the bank and preference) and the failure severity (loss of all or a part of the money invested). The four vignettes used in the experiment can be found in Appendix I.

Using previous work from Grégoire and Fisher (2006, 2008), I selected seven measures to capture the multifaceted components of retaliatory behavior. The attitudinal measures were: *desire for retaliation* (6 items, e.g., indicate to which extent you would want to do something to the organization), *patronage reduction* (4 items, e.g., indicate to which extent you would want to spend less money in this business), *negative word-of-mouth* (3 items, e.g., indicate to which extent you would want to denigrate this organization to friends), and *third party complaining* (3 items, e.g., indicate to which extent you would want to take legal action against the firm). The emotional measures were: *perceived betrayal* (5 items, e.g., through the service failure I felt cheated), *dissatisfaction* (3 items, e.g., through the service failure I felt displeased), and *anger* (3 items, e.g., through the service failure I felt outraged). Scale end points ranged from 1 = strongly disagree to 7 = strongly agree. All the scales used in the experiment can be found in Appendix II. Biological sex was self-reported and Gender Schema was measured using the BRSI scale (Bem, 1974).

4.4 RESULTS

I recruited 62 American participants (45 female/ 17 male), mean age 33.23 (SD=7.39). The conditions were split according to Table 2.

Table 2 – Participants per condition

Condition 1 – High strength of the relationship/ High failure severity	16
Condition 2 – Low strength of the relationship/ Low failure severity	16
Condition 3 – Low strength of the relationship/ High failure severity	15
Condition 4 – High strength of the relationship/ Low failure severity	15

Source: The authors

For the scales, all reliability measures (cronbach's alpha) were performed and entailed results over .70, as Hair et al. (2016) recommend, shown in Table 3.

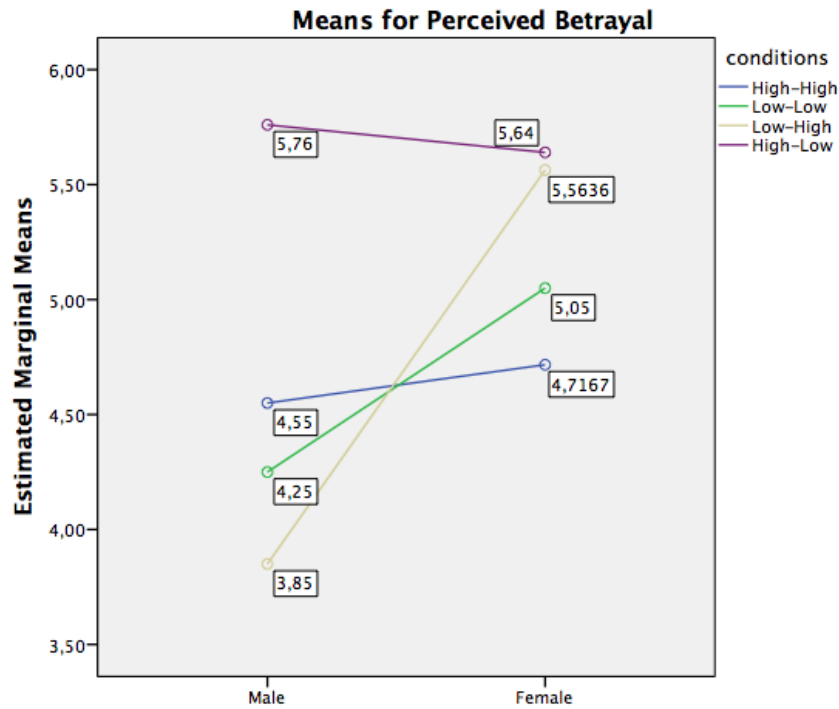
Table 3 – Scale Reliability

Scales	Cronbach's Alpha
Anger	0.93
Desire to Retaliate	0.95
Dissatisfaction	0.94
Negative Word-of-Mouth	0.86
Patronage Reduction	0.90
Perceived Betrayal	0.80
Third Party Complaint	0.86

Source: The author

I performed a factorial Anova. In regards to biological sex, I found no differences in anger, desire to retaliate, dissatisfaction, negative word of mouth, patronage reduction, or third party complaint measures. For the perceived betrayal measure I found no interaction between gender and the conditions. There were main effects for the biological sex at the 10% confidence level ($F(7, 54) = 3.52, p = .07$). For such a small sample, the observed power was half of what Hair et al. (2016) recommend: 45.3% (the goal is to reach an observed power of 80%). The means are shown in Graphic 5.

Graphic 5 – Means for Perceived Betrayal



Source: The author

For the measurement of the gender schema theory it was not possible to screen the four genders beforehand (see appendix III for a detailing of the BRSI scale). The frequencies of four genders are described in Table 4.

Table 4 – Genders Frequencies on Sample

Gender	Frequency
Androgynous	25
Undifferentiated	18
Traditionally Sexed-Typed	12
Cross-sexed Typed	7
Total	62

Source: The author

In regards to the gender-schema theory, I did not find effects of gender on any measures. As such, I can partially confirm H1 and H2: biological sex entailed differences on

retaliatory behaviors, for the perceived betrayal measure and biological sex is a better measure of retaliatory behaviors than gender schema theory.

4.5 DISCUSSION

I did not find differences in all measures of retaliation, perhaps due to small sample size for each condition (n=15). But when performing a post-hoc test using G*Power (Faul et al., 2007) I attested that all the factorial Anova had a power of 21%, less than what is recommended by Hair et al. (2007). Even so, it is important to notice that I did find main effects for biological sex in one measure, perceived betrayal.

I hypothesized that biological sex would be a better measurement of retaliation than gender schema theory, and that was true for perceived betrayal. I also hypothesized that women were more prone to retaliate than men, which was also true for our study.

The reasons for this result are found in evolutionary theory: the vignette I used presented a situation in which the costs were bore by a parent, and women show more aggression regarding their offspring (Hahn-Holbrook et al., 2011; Bosch et al., 2005). In this case, the loss of US\$ 10K as an investment for a child's future could mean a greater cause of aggression for women than for men, as Trivers (1971) explained so well: parental asymmetry. Women know for sure that the offspring are their own, while men are not so knowledgeable, even more so if one regards our evolutionary history (before DNA testing).

There is a vast amount of studies regarding so-called gender fluidity (Gabbard & Wilkinson, 1996; Davis, 2006; Diamond, 2008; Butler, 2011; Thompson and Üstüner, 2015). As Auster and Ohm (2000) described, masculinity and femininity are no longer viewed as bipolar dimensions, but as more of a continuum (according to the post-modernist view at least). I tried to measure the concept of gender using the BSRI scale, but differences in behavior were non-existent. This lack of difference could be due to problems with the scale

itself (Holt & Ellis, 1998) because the scale measures one's self-perception, which can translate into a self-perception bias. One reason for such a bias, according to Choi, Fuqua & Newman (2008) and Auster and Ohm (2000), may be that people are more willing to describe themselves as a mixture of positive traits than are found both in the BRSI-Male and BRSI-Female. This is evident by looking at the larger group in our sample: 25 of the participants were high both on the male and the female traits, and categorized as androgynous (40% of the sample).

Notwithstanding, biological sex was a better measurement of differences in aggression than gender. Self-identification with one gender does not measure if a person will be more or less aggressive when facing financial costs to them and their offspring. Saad (2008) discusses the idea of “collective amnesia” of marketing researchers regarding consumer's biological roots. When I analyze books on gender fluidity (Diamond, 2008; Butler, 2011) I entail in a post-modernist view of the world, in which no truths exist, and one can wake up “feeling” like a woman and end the day “feeling” like a man.

While a nice idea, it is not rooted in reality: when each individual begins his life, as an embryo, one starts to receive input from gonadal (i.e. testosterone, estrogen, and others) hormones, which sexualize both our bodies and brains (Csathó et al., 2003; Young & Alexander, 2012). A more appropriate measurement that could interest marketers is sexual orientation. Previous research links gonadal hormones to sex orientation (as opposed to sex-role self identification). Firms that focus on marketing segments such as homosexuals could be interested in finding what their customers' patterns of indirect aggression are (Bockland & Vilain, 2007; Rahman & Wilson, 2003; Young & Alexander, 2012). Future studies should follow this direction.

4.6 REFERENCES

- Archer, J. (2004). Sex differences in aggression in real-world settings: a meta-analytic review. *Review of general Psychology*, 8(4), 291.
- Bem, S. L. (1974). The measurement of psychological androgyny. *Journal of Consulting and Clinical Psychology*, 42, 155-162.
- Bem, S. L. (1981). Gender schema theory: A cognitive account of sex typing. *Psychological review*, 88(4), 354.
- Bocklandt, S., & Vilain, E. (2007). Sex differences in brain and behavior: hormones versus genes. *Advances in genetics*, 59, 245-266.
- Bosch, O. J., Meddle, S. L., Beiderbeck, D. I., Douglas, A. J., & Neumann, I. D. (2005). Brain oxytocin correlates with maternal aggression: link to anxiety. *The Journal of Neuroscience*, 25(29), 6807-6815.
- Butler, J. (2011). *Gender trouble: Feminism and the subversion of identity*. Routledge.
- Csathó, Á., Osváth, A., Bicsák, É., Karádi, K., Manning, J., & Kállai, J. (2003). Sex role identity related to the ratio of second to fourth digit length in women. *Biological psychology*, 62(2), 147-156.
- Darwin, C. (1888). *The descent of man, and selection in relation to sex* (Vol. 1). Murray.
- Davis, E. C. (2009). Situating “fluidity”(trans) gender identification and the regulation of gender diversity. *GLQ: A Journal of Lesbian and Gay Studies*, 15(1), 97-130.
- De Waal, F. (2006). *Our inner ape: A leading primatologist explains why we are who we are*. Penguin.
- Diamond, L. M. (2008). *Sexual fluidity*. John Wiley & Sons, Ltd.
- Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior research methods*, 39(2), 175-191.

- Gabbard, G. O., & Wilkinson, S. (1996). Nominal gender and gender fluidity in the psychoanalytic situation. *Gender and Psychoanalysis*, 1(4), 463-481.
- Grégoire, Y., & Fisher, R. J. (2006). The effects of relationship quality on customer retaliation. *Marketing Letters*, 17(1), 31–46.
- Grégoire, Y., & Fisher, R. J. (2008). Customer betrayal and retaliation: when your best customers become your worst enemies. *Journal of the Academy of Marketing Science*, 36(2), 247–261.
- Hahn-Holbrook, J., Holt-Lunstad, J., Holbrook, C., Coyne, S. M., & Lawson, E. T. (2011). Maternal defense breast feeding increases aggression by reducing stress. *Psychological science*.
- Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage Publications.
- Hess, N. H., & Hagen, E. H. (2006). Sex differences in indirect aggression: Psychological evidence from young adults. *Evolution and Human Behavior*, 27(3), 231-245.
- Holt, C. L., & Ellis, J. B. (1998). Assessing the current validity of the Bem Sex-Role Inventory. *Sex Roles*, 39(11-12), 929-941.
- Kähr, A., Nyffenegger, B., Krohmer, H., & Hoyer, W. D. (2016). When Hostile Consumers Wreak Havoc on Your Brand: The Phenomenon of Consumer Brand Sabotage. *Journal of Marketing*, 80(3), 25-41.
- Luca, M. (2011). *Reviews, reputation, and revenue: The case of Yelp.com* (No. 12-016). Harvard Business School.
- McAndrew, F. T. (2014). The “sword of a woman”: Gossip and female aggression. *Aggression and violent behavior*, 19(3), 196-199.
- Noak, R. (2015) Sweden is about to add a gender-neutral pronoun to its official dictionary. *The Washington Post*. Available at:

- <https://www.washingtonpost.com/news/worldviews/wp/2015/04/01/sweden-is-about-to-add-a-gender-neutral-pronoun-to-its-official-dictionary/>. Accessed on: 07/14/2016.
- Palan, K. M. (2001). Gender identity in consumer behavior research: a literature review and research agenda. *Academy of Marketing Science Review*, 10(2001), 1-31.
- Pedhazur, E. J., & Tetenbaum, T. J. (1979). Bem Sex Role Inventory: A theoretical and methodological critique. *Journal of Personality and Social Psychology*, 37(6), 996.
- Qualtrics (2014). *Online Survey Software and Insight Platform*. Retrieved from: <http://www.qualtrics.com>.
- Rahman, Q., & Wilson, G. D. (2003). Born gay? The psychobiology of human sexual orientation. *Personality and Individual Differences*, 34(8), 1337-1382.
- Rock, C.; Gallen, J. (2004). *Chris Rock: Never Scared*. [TV Special]. California, CA: Home Box Office Inc. (HBO).
- Rungtusanatham, M., Wallin, C., & Eckerd, S. (2011). The vignette in a scenario-based role-playing experiment. *Journal of Supply Chain Management*, 47(3), 9–16.
- Saad, G. (2007). *The evolutionary bases of consumption*. Psychology Press.
- Saad, G. (2008). The collective amnesia of marketing scholars regarding consumers' biological and evolutionary roots. *Marketing Theory*, 8(4), 425-448.
- Taylor, S. E., Klein, L. C., Lewis, B. P., Gruenewald, T. L., Gurung, R. A. R., & Updegraff, J. A. (2000). Biobehavioral responses to stress in females: tend-and-befriend, not fight-or-flight. *Psychological Review*, 107(3), 411–429.
- Thompson, C. J., & Üstüner, T. (2015). Women skating on the edge: Marketplace performances as ideological edgework. *Journal of Consumer Research*, ucv013.
- Trivers, R. (1972). Parental investment and sexual selection. In: B. Campbell (Ed.) *Sexual Selection and Descent of Men: 1871-1971* (pp. 136-179). Chicago: Adline.

Young, L., & Alexander, B. (2012). *The Chemistry between us: love, sex, and the science of attraction*. Penguin.

4.7 APPENDIX 1 – VIGNETTES USED IN THE EXPERIMENT

C1HH READ CAREFULLY THE TEXT BELOW. TRY TO IMAGINE THE FOLLOWING SITUATION: You have been a loyal client from a traditional bank in your town for the last 5 years. You have a checking account, a savings account and also a mortgage, which you have been paying on time. You trust your account manager, and you have a friendly relationship with him. Recently you and your spouse welcomed a new baby to your family, and both of you wish to start saving for his/her college education. As usual, you turn to your account manager for advice, and the manager suggests an investment moderately risky. You resist for a while, because you and your spouse would prefer a low risk investment for your newborn baby. Your account manager who suggests that is virtually impossible that you will lose all your money finally convinces you. You and your spouse invest 10,000 dollars, which represents the totality of all your savings at the moment. One month later, you and your spouse check the on-line statement for the investment. For your surprise, you ended up losing all of your money in the investment.

C1LL READ CAREFULLY THE TEXT BELOW. TRY TO IMAGINE THE FOLLOWING SITUATION: You have been a trusted client from a traditional bank in your town for the last 5 years. You have a checking account, but this is not your preferred bank. As a matter of fact, you rarely use this account. Recently you and your spouse welcomed a new baby to your family, and both of you wish to start saving for his/her college education. As usual, you turn to your account manager for advice, and the manager suggests a investment moderately risky. You resist for a while, because you and your spouse would prefer a low risk investment for

your newborn baby. Your account manager who suggests that is virtually impossible that you will lose all your money finally convinces you. You and your spouse invest 10,000 dollars, which represents the totality of all your savings at the moment. One month later, you and your spouse check the on-line statement for the investment. For your surprise, you ended up losing 1,000 dollars in the investment.

C1LH READ CAREFULLY THE TEXT BELOW. TRY TO IMAGINE THE FOLLOWING SITUATION: You have been a trusted client from a traditional bank in your town for the last 5 years. You have a checking account, but this is not your preferred bank. As a matter of fact, you rarely use this account. Recently you and your spouse welcomed a new baby to your family, and both of you wish to start saving for his/her college education. As usual, you turn to your account manager for advice, and the manager suggests an investment moderately risky. You resist for a while, because you and your spouse would prefer a low risk investment for your newborn baby. Your account manager who suggests that is virtually impossible that you will lose all your money finally convinces you. You and your spouse invest 10,000 dollars, which represents the totality of all your savings at the moment. One month later, you and your spouse check the on-line statement for the investment. For your surprise, you ended up losing all of your money in the investment.

C1HL READ CAREFULLY THE TEXT BELOW. TRY TO IMAGINE THE FOLLOWING SITUATION: You have been a loyal client from a traditional bank in your town for the last 5 years. You have a checking account, a savings account and also a mortgage, which you have been paying on time. You trust your account manager, and you have a friendly relationship with him. Recently you and your spouse welcomed a new baby to your family, and both of you wish to start saving for his/her college education. As usual, you turn to your account

manager for advice, and the manager suggests an investment moderately risky. You resist for a while, because you and your spouse would prefer a low risk investment for your newborn baby. Your account manager who suggests that is virtually impossible that you will lose all your money finally convinces you. You and your spouse invest 10,000 dollars, which represents the totality of all your savings at the moment. One month later, you and your spouse check the on-line statement for the investment. For your surprise, you ended up losing 1,000 dollars in the investment.

4.8 APPENDIX 2

Scales

Indicate to which extent you would want (scale end points: 1 = strongly disagree to 7 = strongly agree)

1a. Desire for Retaliation

- To do something to the organization
- To take actions to get the organization in trouble
- To cause inconvenience to the organization
- To punish the organization in some way
- To make the organization get what it deserves
- To get even with the organization

1b. Patronage Reduction

- To spend less money at this business
- To stop doing business with this firm
- To reduce the frequency of interaction with the firm
- To bring a significant part of my business to a competitor.

1c. Negative Word-of-Mouth

- To spread a negative word-of-mouth about the organization
- To denigrate this organization to my friends
- To tell my friends to not do business with this firm, when they are looking for a similar service

1d. Third Party Complaining

- To take legal action against the firm
- To report their behavior to a consumer governmental agency
- To contact the media to denounce their behaviors.

Through the service fail I felt (scale end points: 1 = strongly disagree to 7 = strongly agree)

2a. Perceived betrayal

- Cheated
- Betrayed
- Lied to
- The bank did not intend to take advantage of me. (Reverse)
- The bank tried to abuse me

2b. Dissatisfaction

- Dissatisfied
- Displeased
- Discontented

2c. Anger

- Outraged
- Resentful
- Angry

4.9 APPENDIX III

Bem Sex-Role Inventory (BSRI) – (scale end points: 1 = never to 7 = always)

Rate yourself on each item. Answer truthfully.

Self-reliant (1)

Defends own beliefs (2)

Independent (3)

Athletic (4)

Assertive (5)

Strong personality (6)

Forceful (7)

Analytical (8)

Has leadership abilities (9)

Willing to take risks (10)

Makes decisions easily (11)

Self-sufficient (12)

Dominant (13)

Masculine (14)

Willing to take a stand (15)

Aggressive (16)

Acts as a leader (17)

Individualistic (18)

Competitive (19)

Ambitious (20)

Yielding (21)

Cheerful (22)

Shy (23)

Affectionate (24)

Flatterable (25)

Loyal (26)

Feminine (27)

Sympathetic (28)

Sensitive to the needs of others (29)

Understanding (30)

Compassionate (31)

Eager to soothe hurt feelings (32)

Soft spoken (33)

Warm (34)

Tender (35)

Gullible (36)

Childlike (37)

Does not use harsh language (38)

Loves children (39)

5 GENERAL DISCUSSION

Nothing in biology makes sense except in the light of evolution.

Theodosius Dobzhansky

At the end of this journey in the pursuit of my PhD, I learned a lot about evolution and its fundamental tenets. I hope that the three articles that make up this dissertation have shown that. In the first two, I demonstrated that OXT is a molecule found in all mammalian animals (Bartz, 2011). As such, it is obvious that it plays a role in human behavior. Kosfeld et al. (2005) were the first to pinpoint that OXT plays a role in human cooperation, and we have a robust body of work showing that now (VanIjzendoorn & Bakermans-Kranenburg, 2011). But few studies have applied this rationale to consumer behavior. Furst et al. (2015) Lin et al. (2013) and Alexander et al. (2015) are the few examples I could find. The theoretical article makes an argument for more studies involving the relationship between OXT and consumer behavior, focusing on a few variables of interest for marketing researchers. The experimental studies of the second article show that OXT plays a role in brand trust, pointing to a causal relationship between OXT and brand trust. Evolutionary reasoning was central to the design of the three experiments: first the role of known compared to unknown brands was derived from the function that OXT plays in attachment between mothers and their offspring. I reasoned that known brands already have created this familiarity with the public and, as such, would reap increased effects of the infusion of OXT, which turned out to be true. Unfortunately, in the second study, I could not replicate the results by Ma et al. (2014). Country-of-origin effects did not respond to the infusion of OXT, and this calls for further investigation. Maybe it all relates to the results of the third study: status brand showed decreased means for brand trust when participants were infused with OXT, and the product paired with the COO was a wristwatch known for its status signaling.

Finally, the third article makes an argument that I am passionate about: positivism vs. post-modernism. When comparing the two epistemologies in the subject of biological sex compared to gender, men and women showed different retaliatory behavioral patterns, despite identifying as male, female, etc. The post-modernist view of the world, where everything is malleable and due to culture seems to be ingrained in academia, turning our marketing departments in humanities departments, driving students further from the scientific reasoning and the scientific method. I do not wish to imply that our behavior is fixed or biologically determined: I only wish to convey the idea that there is, indeed, a reality to be studied and examined. Since the Copernican revolution humans have dwelled with theories and ideas that tried to understand the world as it is, not changing it according to our political agendas. Maybe it is time to incorporate evolutionary reasoning to our field, to the benefit of both researchers and practitioners.