FACULTEIT ECONOMIE EN
BEDRIJFSWETENSCHAPPEN



KATHOLIEKE
UNIVERSITEIT
LEUVEN

Materialism, conspicuous consumption, and the human nature

Proefschrift voorgedragen
tot het behalen van de graad
van Doctor in de Toegepaste
Economische Wetenschappen

door

Inge LENS

Nummer 388 2012

Daar de proefschriften in de reeks van de Faculteit economie en bedrijfswetenschappen het persoonlijk werk zijn van hun auteurs, zijn alleen deze laatsten daarvoor verantwoordelijk.

COMMITTEE

ADVISORS

Prof. Dr. Luk Warlop
KU Leuven & Norwegian Business School

Prof. Dr. Mario Pandelaere
UGent

Prof. Dr. Siegfried Dewitte
KU Leuven

Prof. Dr. Tim Kasser
Knox College, Illinois

Prof. Dr. Jill Sundie
University of Texas at San Antonio, Texas

DANKWOORD

"Doctoreren? Ik? Nooit! Doctoreren is saai."

Dat waren mijn woorden tijdens mijn voorlaatste jaar in communicatiewetenschappen. Toen ik mijn eindverhandeling begon te schrijven, werd deze mening genuanceerd tot: "*Doctoreren? Dat is voor saaie mensen"*. Want onderzoek doen op zich, dat bleek eigenlijk best leuk te zijn. Zo leuk zelfs, dat ik een jaar later mijn handtekening zette onder een contract dat me officieel toegang gaf tot de club der saaie mensen. Dat laatste bleek al gauw echter een totaal verkeerde inschatting te zijn… Dit dankwoord is gericht aan alle inspirerende, sympathieke, grappige, steunende, intrigerende, en vooral allesbehalve saaie mensen die van de afgelopen jaren een onvergetelijke tijd hebben gemaakt.

Mario, mijn enthousiasme voor onderzoek heb ik in grote mate aan jou te danken. Weinig mensen die ik ken zijn zo goed in staat om anderen te motiveren als jij. Bedankt voor de kansen die je me hebt gegeven, voor je kennis (niet in het minst over statistiek) die je met mij gedeeld hebt, voor de lekkere etentjes tussendoor en je eindeloze enthousiasme. Luk, toen ik na het vertrek van Mario uit Leuven een beetje eenzaam achterbleef bij communicatiewetenschappen heb je mij heel hartelijk ontvangen in de marketinggroep. Ik ben tot op heden heel blij dat ik deze stap heb gezet. Bedankt, ook voor het vertrouwen en de vrijheid die je me gegeven hebt, voor je inzichten en kritische geest. Siegfried, bedankt voor het enthousiasme en de nauwkeurigheid waarmee je steeds weer mijn ideeën van feedback hebt voorzien. Het is een plezier om voor jou een project te mogen presenteren. Tim, for a very good reason you are the most cited author in my reference list. Thank you very much for being a great source of inspiration during the past years, for your encouraging words, and for the challenging questions you raised about my manuscript. I hope that I will be able to come up with good answers to your questions in future research. Jill, thank you so much for the detailed comments you gave about my essays and for sharing your expertise in evolutionary psychology. Thanks to your suggestions I have lots of new ideas on how to position my papers or how to finish them.

Tijdens mijn doctoraat heb ik in twee onderzoeksgroepen aan twee faculteiten gewerkt. Ik begon aan een doctoraat in de sociale wetenschappen, maar verdedig uiteindelijk een doctoraat in de toegepaste economische wetenschappen. Door deze overstap heb ik heel wat bureaus 'versleten' en heel veel

boeiende mensen leren kennen. Ook heb ik het geluk gehad om tijdens mijn doctoraat vaak op congres te kunnen gaan. Tot 9 maal toe liet ik mijn reispas afstelpelen aan een Amerikaanse grenscontrolepost en ik verkende 5 Europese steden. Zonder mijn toffe collega's zouden deze ervaringen ongetwijfeld een pak minder leuk geweest zijn. Vandaar dat ook zij in dit dankwoord een belangrijke plaats verdienen.

Aan mijn vroegere collega's bij communicatiewetenschappen, in het bijzonder Kim en Christine: Jullie waren mijn eerste echte "collega's". Jullie maakten me wegwijs in het leven van een doctoraatstudent, samen *biketen* we *the brigde*. Kim, hoe vreemd dit ook mag klinken, twee van mijn verjaardagen begonnen in een bed met jou: eentje bij Christine thuis, eentje in New York. Dat privilege is niet voor iedereen weggelegd ☺. Bedankt voor de leuke tijden!

Aan mijn collega's bij marketing: Ik heb zoveel mensen weten komen en gaan dat ik schrik heb om mensen te vergeten wanneer ik een lijstje maakt. Toch doe ik een poging: Aiste, Anne, Bart, Bert, Bram, Carlos, Efty, Els, Evi, Guy, Hannelore, Helen, Huiying, Ines, Jana, Jamie, Jan R, Jan V, Joke, Kobe, Kristina, Laure, Leen, Lien, Liesbeth, Maarten, Marijke, Pieter, Push, Robrecht, Sabrina, Sam, Tim, Valérie, Wouter, Yannick: thanks for the nice talks we had during lunch- and other breaks, for sharing your knowledge and good advice, for the laughs and encouagements! Isabelle Theys, jij ook in het bijzonder bedankt voor al je hulp doorheen de jaren!

De 04.149 is een speciaal kantoor geweest voor mij: mijn eerste eigen bureau. Na enkele maanden alleen gezeten te hebben, kwam Anouk me vergezellen. Anouk, je was een beetje zenuwachtig en onzeker in het begin, maar al gauw werd je voor mij een bureaugenoot uit de duizend. We konden samen lachen en hard werken. We deelden onze dagelijkse beslommeringen en motiveerden elkaar tijdens onze beruchte denktankmomenten. Bedankt voor de fijne tijd! Cara, jij kwam me vergezellen tijdens de laatste maanden van mijn doctoraat. Bedankt voor je steun tijdens mijn "laatste loodjes", voor je gulle glimlach en de gezelligheid!

Jiska, je introduceerde de Anthropologie in mijn leven. Dankzij jou ben ik nu een paar honderden euro's armer. Niettemin, bedankt! Ook voor je gezelschap tussen de alligators van de Everglades en voor je steun doorheen de jaren. Karolien, aan leuke momenten samen geen gebrek. Ochtendlijke wedstrijdjes sudoku, mijn eerste vergokte dollar, mijn eerste sushi, natte voeten in New York en Kopenhagen, verhaaltjes verzinnen in de bus in Slovenië, en zo kan ik nog wel een tijdje doorgaan. Als ik ooit oud en versleten terugdenk aan mijn jaren als doctoraatstudent is de kans heel groot dat jij er ook bij zal zijn in mijn herinnering. Super (☺) fel bedankt! To my "Norwegian" friends Mehrad, Ali, and Radu: Thanks a lot for your hospitality, for the great moments we shared together and for the fun talks we had. Getting to know you has been a pleasure and I hope to see all of you again soon (and I promise that you don't have to ride a bike next time you visit my place ;).

Tot slot zijn er ook nog heel wat mensen die geen collega's zijn, maar die toch op allerlei manieren hun steentje hebben bijgedragen aan dit doctoraat. Enkele mensen verdienen een speciale vermelding:

Sanne, ik heb steeds met veel plezier uitgekeken naar onze ontspannende lunchdates (inclusief de daaropvolgende post-lunchdips). Hopelijk vinden we ook in de toekomst een manier om ons traditietje verder te zetten! Ook bedankt voor het leveren van je geslaagde manipulatie in studie 2 (essay 3b) ☺.

Jan, Mama en Nor, het spreekwoord zegt dat de laatsten de eersten zullen zijn en in dit geval klopt dit als een bus. Jullie komen op de eerste plaats, mijlenver vóór dit doctoraat. Jullie waren de eersten waarbij ik met mijn frustraties kwam aanzetten, de eersten die het hoorden wanneer presentaties goed gegaan waren, de eersten die geïnformeerd werden over eender wat. Jan, ik besef dat je veel geduld met mij gehad hebt wanneer ik geconcentreerd aan het werken was, een examen of presentatie moest leren of wanneer ik je weer eens een week alleen liet zitten om op congres te gaan. En toch heb je mij altijd gesteund, zat je altijd in mijn team. Dat heeft me heel veel deugd gedaan. Bedankt, voor alles.

Inge – 04.04.2012

CONTENTS

INTRODUCTION ..... - 1 -

Materialism: A general introduction ..... - 2 -

Materialism and conspicuous consumption ..... - 3 -

The evolutionary psychological perspective as a framework to study conspicuous consumption behavior ..... - 4 -

Introduction to essay 1 ..... - 6 -

Introduction to essay 2 ..... - 7 -

Introduction to essays 3a and 3b ..... - 8 -

ESSAY 1: THE ROLE OF MATERIALISM IN THE OCCURRENCE OF THE ENDOWMENT EFFECT ..... - 11 -

Abstract ..... - 11 -

Introduction ..... - 12 -

The endowment effect ..... - 13 -

Materialism as a moderating factor ..... - 14 -

Study 1 ..... - 15 -

Study 2 ..... - 17 -

Study 3 ..... - 22 -

General discussion ..... - 25 -

Appendix 1. Gadgets study 2 ..... - 29 -

ESSAY 2: MATERIALISM, (WOMEN'S) CONSPICUOUS CONSPUMPTION, AND THE HUMAN MATING GAME ..... - 31 -

Abstract ..... - 31 -

Introduction ..... - 32 -

Evolution, reproduction, and conspicuous consumption ..... - 32 -

Women's conspicuous consumption and (relative) mate value ..... - 33 -

Materialism and (women's) conspicuous consumption ..... - 35 -

Overview of studies ..... - 35 -

Study 1 ..... - 36 -

Study 2 ..... - 38 -

Study 3 ..... - 43 -
General discussion ..... - 51 -
Appendix 2. Drawing task study 2 ..... - 55 -
Appendix 3. Manipulation and experimental set-up study 3 ..... - 56 -

ESSAY 3A: WOULD MALE CONSPICUOUS CONSUMPTION CAPTURE THE FEMALE EYE? MENSTRUAL CYCLE EFFECTS ON WOMEN'S ATTENTION TO STATUS PRODUCTS ..... - 57 -
Abstract ..... - 57 -
Introduction ..... - 58 -
Theoretical background ..... - 58 -
Study 1 ..... - 60 -
Study 2 ..... - 65 -
General discussion ..... - 68 -

ESSAY 3B: ROMANTIC MOTIVES AND MEN'S CONSPICUOUS CONSUMPTION BEHAVIOR: THE ROLE OF MATERIALISM ..... - 73 -
Abstract ..... - 73 -
Introduction ..... - 74 -
Theoretical background ..... - 75 -
Materialism, conspicuous consumption, and mating strategies ..... - 75 -
Study 1 ..... - 78 -
Study 2 ..... - 79 -
Study 3 ..... - 82 -
General discussion ..... - 84 -
Appendix 4. Products study 2 ..... - 87 -

GENERAL DISCUSSION ..... - 89 -
Materialism, loss aversion, and the endowment effect ..... - 89 -
About materialism, intersexual selection, and intrasexual competition ..... - 93 -
Some closing thoughts about the definition of materialism ..... - 100 -

REFERENCES ..... - 103 -

LIST OF FIGURES

Figure 1. Prices (in euro) for sellers and buyers scoring low to high on materialism ..... - 17 -
Figure 2. Prices (in euro) for sellers and buyers scoring low to high on materialism in the control and mortality salience condition ..... - 25 -
Figure 3. Expected required financial resources ..... - 37 -
Figure 4. Interpersonal distance (in pixels) ..... - 40 -
Figure 5. Expected effort in terms of money ..... - 42 -
Figure 6. Male and female participants' evaluation of the interaction ..... - 48 -
Figure 7. Male and female participants' non-verbal behavior during the interaction (evaluated by the female confederate) ..... - 49 -
Figure 8. Male and female participants' evaluation of the juice during the taste test ..... - 50 -
Figure 9. Proportion of recalled products ..... - 63 -
Figure 10. Relative position of recalled status products ..... - 64 -
Figure 11. Spending intentions on conspicuous and inconspicuous products ..... - 67 -
Figure 12. Attractiveness ratings of gadgets and functional products ..... - 81 -

LIST OF TABLES

Table 1. Mean endowment effect for the individual gadgets, interaction with materialism and regression slopes (se in brackets) ..... - 20 -
Table 2. Correlations between materialism and mating strategies ..... - 79 -

INTRODUCTION

Materialism is the first word in the title and is without any doubt the most important concept in this manuscript. Materialism is conceptualized as a set of values and beliefs that reflects an overall emphasis on the acquisition and possession of material goods as a means of satisfying personal goals such as success and happiness (Richins & Dawson, 1992), and has been investigated across a wide variety of disciplines, including philosophy, anthropology, sociology, psychology, and marketing (for reviews, see Ahuvia & Wong, 2002; Belk, 1985).

Materialism is a highly studied topic across disciplines, not to the least because of its presumed negative consequences. For instance, materialism is related to short-sighted consumption patterns that may lead to unhappiness, including overspending and debt (Richins, 2011; Watson, 2003), and compulsive buying behavior (Dittmar, 2005; Rindfleisch, Burroughs, & Denton, 1997; Roberts, Manolis, & Tanner, 2003). Not surprisingly, materialism appears to be problematic for individuals' well-being and happiness (Belk, 1985; Kasser & Ryan, 1993; Sheldon, Ryan, Deci, & Kasser, 2004; see Burroughs & Rindfleisch, 2002 for a comprehensive review). Also, materialism is related to higher levels of social anxiety (Chang & Arkin, 2002; Schroeder & Dugal, 1995) and neuroticism (Mick, 1996). From a societal level, materialism is problematic as well (Rose & DeJesus, 2007). For instance, materialistic individuals care less about their social community (Burroughs & Rindfleisch, 2002), they are less likely to donate money (Richins & Dawson, 1992), or to be concerned about environmental issues (Clump, Brandel, & Sharpe, 2002).

One behavior that is often associated with materialism is *conspicuous consumption behavior*. Conspicuous consumption refers to a pattern of consumption aimed at signaling status. According to insights in evolutionary psychology and biology, this pattern of consumption may even have developed as a strategy to gain reproductive rewards, especially for men. I will come back to this later in this introduction.

The term *human nature* is probably the vaguest term in the title, yet it applies to the essays presented in this manuscript in a number of ways. First, it refers to the evolutionary psychological/ biological framework that is used in several of my essays. Second, typical about our "human nature" is that we are social beings. We are constantly communicating and we interact with many different people in a variety of contexts. In fact, even many of the products we consume fulfill a communicative function (especially in the case of conspicuous consumption). Some interactions we engage in fulfill an economic function, aimed at exchanging products, while other interactions may have an in- or explicit sexual purpose. Irrespective of the purpose of an interaction, numerous factors may shape its course, outcome, or the way the interaction is experienced by those involved in it. All of the essays included in this dissertation aim to

investigate the influence of two such factors: the level of *materialism* of an individual, and the products (in particular *status-signaling products*) s/he consumes (i.e., conspicuous consumption).

So, although the topics of materialism and conspicuous consumption have received much research attention, many questions remain to be answered; especially with respect to the consequences of a material value orientation and related consumption behavior for social interactions. For instance, how does materialism influence the outcome of interactions between buyers and sellers (essay1)? Or, are interactions less pleasant when one of the interaction partners is materialistic (essay 2)? Or even, is conspicuous consumption useful to draw the attention of potential sexual partners (essay 3a) or does materialism influence the partners we choose in the first place (essays 3b)?

This dissertation aims to provide some insight in the answers to these questions. By combining theoretical frameworks from economics, consumer research, and evolutionary biology and psychology, this dissertation aims to enhance our insight in the functions of materialism and conspicuous consumption in constituting specific aspects of our human nature (e.g., our social nature or specific mating strategies) and to raise challenging questions for future research about materialism and conspicuous consumption.

Materialism: A general introduction

For a long time, materialism has been studied from a cultural perspective which considered materialism to be a characteristic of the American (and by extension the Western; cf. Ger & Belk, 1996) consumerist culture (Belk, 1985). Research within this perspective considered individuals as being part of a fairly homogeneous group of which all members are driven by a desire for products (Richins & Dawson, 1992). More recent materialism research has altered its focus from cultures to individuals. This perspective allows to document individual differences in materialism and to better investigate its antecedents and consequences. The majority of studies presented in this dissertation fit within this stream of research as they examine diverse consequences of materialism as a personality characteristic.

More specifically, throughout this manuscript materialism is conceptualized as a fairly stable consumer value (Richins & Dawson, 1992). According to Richins and Dawson's (1992) conceptualization, materialism comprises three dimensions. 1) Materialists are strongly attached to possessions and their acquisition (*Acquisition centrality*). 2) This attachment to possessions and wealth stems from the belief that acquisition is a necessary means to secure life-satisfaction and happiness *(acquisition as the pursuit of happiness).* 3) Materialism is related to a desire to be successful and to achieve this goal through the purchase and consumption of material goods (*possession-defined success*).

In general, two broad categories of antecedents of materialism are distinguished (Chang & Arkin 2002). First, studies have related materialism to different kinds of insecurities (e.g., low self-esteem: Chaplin & John, 2007, 2010; self-doubt: Chang & Arkin, 2002; insecure childhood: Kasser et al., 1995; Rindfleisch, Burroughs, & Denton, 1997; mortality salience: Christopher, Drummond, Jones, Marek, & Therriault, 2006; Kasser & Sheldon, 2000; Mandel & Heine, 1999; Rindfleisch, Burroughs, & Wong, 2008). This stream of research assumes that, in response to experiences of insecurity, individuals may turn to material possessions for a sense of security (Chang & Arkin, 2002). Interestingly, even the dreams of materialistic versus non-materialistic people tend to differ with respect to the presence of themes related to different kinds of uncertainties. For instance, materialists dream more often about death or interpersonal conflicts (Kasser & Kasser, 2001).

Second, materialism is assumed to result from socialization processes (Chang & Arkin, 2002). Prior materialism research has particularly investigated the role of family, peers, and major mass communication channels, such as television and advertising, as potential socializing agents (Buijzen & Valkenburg, 2003; Chan & Prendergast, 2007; Kasser, Ryan, Zax, & Sameroff, 1995; Moschis & Moore, 1982; Rose & DeJesus, 2007; Shrum, Burroughs & Rindfleisch, 2005). Hence, materialism could result from a combination of two factors: a cultural or social environment which promotes the acquisition of material objects and specific personality characteristics or life experiences which render individuals more or less likely to internalize this materialistic message.

Materialism and conspicuous consumption

> *"The basis on which good repute in any highly organized industrial community ultimately rests is pecuniary strength; and the means of showing pecuniary strength (…) are leisure and a conspicuous consumption of goods."*
>
> *— Thorstein Veblen (1899)*

One behavior that is typically related to materialism is conspicuous consumption behavior (Richins, 1994a; Wong, 1997). The idea that individuals use products not only for their economic value, but also for their symbolic meaning has been widely accepted (e.g., Belk, 1988; Belk, Bahn, & Mayer, 1982; Dittmar, 1991; Levy, 1959; Richins, 1994b). For instance, product use may assist individuals in expressing aspects of their desired identity (Belk, 1988; Kleine, Kleine, & Kernan, 1993; Shavitt, 1990) or in associating themselves with desired reference groups (Escalas & Bettman, 2005). In particular products that signal one's resources

or status are consumed for their symbolic value, rather than for their intrinsic, functional qualities (Eastman, Goldsmith, & Flynn, 1999; O'Cass & Frost 2002; Vigneron & Johnson, 2004).

Signaling one's status or resources through consumption has been coined *conspicuous consumption* (Veblen, 1899/1994). Clearly, not all products are equally adequate to signal status. Status products derive their signaling qualities from the fact that others recognize these products as signals of their owners' wealth and status (Eastman, Goldsmith, & Flynn, 1999; Richins, 1994b). This implies that status products are visible to others (Eastman, Goldsmith, & Flynn, 1999; Han, Nunes, & Drèze, 2010). In addition, to serve as a signal of wealth and resources, status products are generally expensive and exclusive (Eastman, Goldsmith, & Flynn, 1999; Frank, 1999; O'Cass & Frost 2002; Vigneron & Johnson, 2004).

More than a century ago, Thorstein Veblen (1899) already noted that many rich Americans spent large sums of money on wasteful expenditures, just to show that they can. Nowadays, even many people with lower incomes tend to spend a considerable amount of money on conspicuous consumption (Dynan, Skinner, & Zeldes, 2004). Given the societal relevance of this behavior as well as its presumed relationship with materialism, a number of studies presented in this dissertation specifically focus on conspicuous consumption.

The evolutionary psychological perspective as a framework to study conspicuous consumption behavior

A vastly increasing body of research shows that diverse consumer behaviors can be explained, at least to some extent, by their evolutionary underpinnings (cf. Saad, 2007; Saad & Gill, 2000). From an evolutionary psychological perspective, status product consumption is particularly interesting as it seems to have developed as a strategy to gain specific reproductive rewards (De Fraja, 2009; Miller, 2009; Saad 2007), especially for men (Griskevicius et al. 2007; Sundie et al., 2011). To understand the origins of this reasoning I will briefly touch upon the basics of evolutionary thinking.

In his ground-breaking work *On the Origin of Species* (1859), Charles Darwin proposed a theory of natural selection to explain that, over time, species evolve because some genetic variations pass down more reliably to next generations due to advantages they produce for survival or reproduction. For instance, suppose that once a lot of variation existed in the length of giraffes' necks. Those giraffes who were genetically predisposed to grow a longer neck had more and better access to food (they could more easily grasp leafs from trees), and thus had better chances of survival. Consequently, giraffes with longer necks would have had more chances to survive and to reproduce, such that in later generations disproportionally many giraffes would grow longer necks (Buss, 2004).

Although this theory is highly valuable in explaining changes within species over the course of evolution, Darwin remained puzzled by a number of examples in nature which seemed to be inconsistent with his theory, such as the fact that many animals (for instance peacocks) possess showy traits (such as large, bright tails) which–at first glance–impede their chances of survival (Darwin, 1871). To explain such phenomena, Darwin introduced the theory of sexual selection, which explains the evolution of characteristics adaptive for reproduction, rather than for survival. An important component of this theory is the idea of intersexual selection (Buss, 2004).

The fact that it is so costly to sustain a large, bright tail, gives a reproductive advantage to peacocks that succeed in doing so. Indeed, if a peacock can afford the huge cost involved in sustaining a large tail, this signals to peahens that this particular peacock is likely to possess valuable underlying qualities (e.g., fitness, health) and therefore makes an attractive mating partner (Miller, 2009). In a similar vein, a number of researchers have proposed that men's investment in flashy, status-signaling products (i.e., conspicuous consumption) may fulfill an analogous function as the peacock's tail and thus can also be considered as a costly signal of mate value (Miller, 2009). After all, not all men are able to (continue to) carry the cost of lavishly spending money on status products (e.g., a fully equipped sports car). Hence, like for the peacock, it may be an indicator of genetic quality if a man is able to sustain a wasteful and ostentatious consumption pattern (Miller, 2009; Sundie et al., 2011). Consequently, just like a beautiful tail for peacocks, engagement in status-signaling consumption behavior may produce advantages for men on the mating market.

The fact that especially men tend to engage in costly signaling to attract sexual partners is often assumed to result from sex differences in parental investment which have led to differences in partner preferences (Bjorklund & Shackelford, 1999; Trivers, 1972). More specifically, in comparison with men, there are greater limitations to the number of offspring a woman is physically able to produce and reproduction tends to involve a greater obligatory cost of time and energy for women than for men. Because reproduction was fairly risky for ancestral women, evolution has favored those women who were more discriminating with respect to their partner choice (Buss, 2004). Until today, women tend to be choosier in their selection of a mating partner (Bjorklund & Shackelford, 1999; Buss, 1989; Trivers, 1972). As a result, it is especially important for men to convince women of their qualities as mating partners (Baumeister & Vohs, 2004). Hence, men are more likely to compete with each other for women's sexual interest, for instance with their consumption of status-signaling products (Griskevicius et al., 2007; Janssens et al., 2011; Sundie et al., 2011).

Given the relevance and the relative newness of the evolutionary perspective to study consumer behavior, a number of essays presented in this dissertation draw upon ideas from the evolutionary psychology literature to introduce and test novel hypotheses about conspicuous consumption and materialism.

Taken together, although much research attention has been devoted to the topics of materialism and conspicuous consumption in the past, many questions remain to be answered and interesting new hypotheses may come up when these topics are studied from a different perspective, for instance a mating perspective. In four essays (1, 2, 3a, and 3b), I tried to tackle some of these questions. In the next paragraphs I will briefly introduce the content and the theoretical framework of each essay, as well as its relevance to the broader field of research.

Introduction to essay 1

Earlier materialism research documents that materialistic individuals like to own products and spend money to acquire them (Richins & Dawson, 1992; Watson, 2003), yet, prior research offers little insight in how the experience of ownership influences materialists' relationship with their possessions. Ger and Belk (1996) suggested that materialists tend to hang on to their possessions (a characteristic they label *preservation*). However, it is unclear how this translates to a transactional context where materialists have the chance to sell or exchange some of their possessions. This is the focus of a first essay.

Insights from the endowment effect literature (e.g., Kahneman, Knetsch, & Thaler, 1990; Thaler, 1980) form the theoretical and methodological framework of essay 1. Standard economic theories assume that people's preferences are relatively stable (at least in the short run). So, based on these theories one would assume that differences between a person's maximum buying price for a product and his/her minimum selling price to give up this product would be negligible. However, numerous studies have found that people start to value a product more once they obtain ownership of it. Consequently, people generally want to sell a product at a higher price than the price they want to pay for it if they do not own the product yet. This so-called *endowment effect* is one of the fundamental phenomena documented in behavioral economics. We propose that materialistic individuals will display a larger endowment effect. Specifically, we propose that materialists will be more reluctant to sell their possessions, resulting in larger minimum selling prices (and thus a larger discrepancy between minimum selling prices and maximum buying prices for the same product).

Indeed, we will show that materialism, both measured and manipulated, moderates the endowment effect. We find evidence for an endowment effect (i.e., significant discrepancy between buying and selling prices for the same product) for materialistic individuals, not for people scoring low on materialism. Specifically, we will show that minimum selling prices increase with increasing materialism, while materialism appears to be unrelated to maximum buying prices for the same products, even when these products are quite desirable to own. Hence, while it seems common sense to assume that

materialistic individuals want to have things at any cost—after all materialism is related to higher spending tendencies (Richins & Dawson, 1992; Richins, 2011; Watson, 2003)—this essay shows that this proposition may not necessarily be true. In addition, the fact that we find an endowment effect for people scoring high on materialism, not for people scoring low on materialism, provides interesting insights in the occurrence of the endowment effect. It seems that a certain threshold of materialism should be reached for an endowment effect to occur.

Finally, these findings may also have implications of methodological nature. Two commonly administered materialism scales are the scales of Belk (1984, 1985) and Richins and Dawson (1992). Both scales are designed to measure fairly stable characteristics or life orientations. Yet, a sensitive instrument measuring temporal fluctuations in the salience of material values, for instance induced by an experimental manipulation, is currently lacking. Our findings will show that the results of a fairly simple task in which participants are instructed to state selling prices for a number of real or imagined endowments may provide a reasonably accurate indication of an individual's endorsement of material values at a certain point in time. We will thus argue that willingness to accept could be used as a sensitive measure of state materialism.

Introduction to essay 2

Does the endorsement of a material value orientation produce negative outcomes for interpersonal relationships? This question formed the starting point for essay 2. It is often assumed that materialistic individuals have less satisfying relationships with others (e.g., Richins & Dawson, 1992; Solberg, Diener, & Robinson, 2004), yet to my knowledge little prior research has investigated whether the course of a social interaction is negatively influenced when one of the interaction partners is or appears to be materialistic.

Next to materialism, this essay also introduces the notion of conspicuous consumption. Specifically, this essay investigates whether materialistic individuals respond differently depending on the level of conspicuous consumption behavior displayed by an interaction partner. Much prior research has addressed questions about personal motivations for engaging in conspicuous consumption behavior (e.g., Griskevicius et al., 2007; Rucker & Galinski, 2008, 2009; Sivanathan & Pettit, 2010). However, questions regarding the impact of conspicuous consumption remain largely unanswered. For instance, how is a person who conspicuously flaunts status products perceived by others? And, do people behave differently when interacting with a person who engages in conspicuous consumption behavior? After all, an act of conspicuous consumption behavior only produces the desired effect (communicating or increasing status, cf. Veblen, 1899/1994) if it is noticed and reacted upon by others (Eastman, Goldsmith, & Flynn, 1999; Han,

Nunes, & Drèze, 2010). Consequently, conspicuous consumption may have important implications for the actual course of social interactions, although only few studies investigated this.

Two exceptions are papers by Nelissen and Meijers (2011) and by Fennis (2008). Their studies highlight the possibility that conspicuous consumption may produce desirable outcomes for the person engaging in it. For instance, conspicuous displays of status may elicit favorable treatments from interaction partners (such as higher offers in a dictator game: Nelissen & Meijers, 2011, or submissive behavior: Fennis, 2008). Our studies differ from these papers in three important ways. 1) We include materialism as a potential moderator, 2) we focus on participants' interpretation of the status-signaling consumption behavior of an interaction partner and on their evaluation of the interaction, and 3) we emphasize the role of participants' sex.

Indeed, because status product consumption is a behavior that is typically associated with men, not to the least because of the reproductive advantages they may gain from engaging in this behavior (Griskevicius et al., 2007; Sundie et al., 2011), it is likely that individuals will react differently to someone else's conspicuous consumption depending on their own sex, as well as on the sex of the interaction partner. In this essay, we specifically focus on interactions in which the interaction partner who engages in conspicuous consumption behavior is female, and the participant, whose level of materialism is assessed, is male. After all, while it has been documented fairly well how men's conspicuous consumption is perceived or reacted upon (e.g., Griskevicius et al., 2007; Sundie et al. 2011; Fennis, 2008), it is much less clear which effects women's conspicuous consumption behavior produces.

In three studies this essay shows that men, in particular when they score high on materialism, tend to interpret women's conspicuous consumption as a signal that she has high standards with respect to the amount of financial resources she requires from a mating partner. We will argue and show that this may render materialistic men uncertain about the effectiveness of their mating efforts, which, in turn, may result in a decrease in the display of affiliative non-verbal behaviors and a more negative evaluation of an interaction.

Introduction to essays 3a and 3b

Essay 3 is divided in two parts, essay 3a and essay 3b. These essays are coupled because, in essence, they study the same topic, namely conspicuous consumption as a (male) mate attraction strategy. However, they are not united in one project because 1) they approach this topic from two related, yet different perspectives: a female (3a) and a male (3b) perspective, and 2) because they involve different dependent variables and theoretical and methodological frameworks.

In particular, essay 3a fits within a growing body of literature investigating effects of hormonal shifts related to women's menstrual cycle (specifically ovulation) on their (partner) preferences, behavior, and consumption patterns (e.g., Durante et al., 2011; Gangestad, Garver-Apgar, Simpson, & Cousins, 2007; Gangestad, Thornhill, & Garver-Apgar, 2005; Garver-Apgar, Gangestad, & Thornhill, 2008; Grammer, Renninger, & Fischer, 2004; Haselton & Gangestad, 2006; Haselton et al., 2007; Hill & Durante, 2009; Lukaszewski & Roney, 2009; Miller, Tybur, & Jordan, 2007; Roney & Simmons, 2008). Specifically, we will investigate whether men's conspicuous consumption behavior might be particularly noticeable to *ovulating* women. Consistent with our predictions, we will show that ovulating women's attention to (male) status products (not to functional products) increases (compared to the attention of women in different periods of their menstrual cycle and compared to pill users' attention). In a subsequent study, we will show that this increase in attention is unlikely to be driven by a mate attraction motive.

In essay 3b we turn to the male side of the story. We will test the prediction that not all men are equally strongly inclined to engage in conspicuous consumption behavior to attract a female mating partner. In particular, we will propose and show that materialistic men are inclined to do so, whereas men scoring low on materialism even seem to be less interested in conspicuous consumption when a mating mindset is activated.

These findings are especially relevant in the light of prior research which has found that in particular men with short-term mating goals and an unrestricted sociosexual orientation tend to rely on conspicuous consumption to achieve reproductive rewards (Sundie et al., 2011). Hence, according to the findings of Sundie and colleagues (2011), materialistic men's mating strategy is typically recognized by women as a low-investment strategy. To shed more light on this matter, a second aim of this essay is to assess the relationship between materialism, sociosexual (un)restrictedness, and partner preferences. To my knowledge, no prior research has examined these relationships in depth. Essay 3b constitutes a first attempt to fill this gap.

ESSAY 1:

THE ROLE OF MATERIALISM IN THE OCCURRENCE OF THE ENDOWMENT EFFECT

Abstract

Past research documents an asymmetry between consumers' willingness to pay for an object and their willingness to accept to give up this object. The current essay presents three studies which demonstrate that materialism moderates this *endowment effect*. We find that materialistic sellers (owners) demand higher prices for their possessions than less materialistic sellers, yet materialism does not predict non-owners' buying prices. Increasing the attachment to material values with a mortality salience procedure augments the endowment effect even more, particularly for materialists. Implications of these findings for future research on the endowment effect and materialism are discussed.

Introduction

A substantial amount of research documents a consistent discrepancy between people's willingness to pay (WTP) for an object (i.e., their maximum buying price) and their willingness to accept (WTA) to be deprived of the object (i.e., their minimum selling price). People often demand higher prices to sell an owned object than the price they are willing to pay for that object if it is not yet in their possession. This asymmetry is generally referred to as the endowment effect (Kahneman, Knetsch, & Thaler, 1990; Thaler, 1980).

Put differently, people assign more monetary value to an object they possess than to one they do not possess for no other reason than because they own it (Tom et al., 2007). Such a discrepancy between buying and selling prices may encumber a rationally efficient distribution and exchange of goods (Bischoff & Meckl, 2008; Mandel, 2002). Therefore we believe it is valuable to identify the conditions under which a divergence between WTP and WTA is found. That is, to identify moderators of the endowment effect.

Given the vital role of material goods in the life of many contemporary consumers and the reluctance of materialistic individuals to share their belongings with others (Belk, 1984; Richins & Dawson, 1992), this paper proposes that materialism moderates the endowment effect. A material value orientation, once primarily attributed to the American consumerist culture (Belk, 1985), seems to dominate an ever increasing part of the world (Ger & Belk, 1996). As a result, the impact of the pricing distortion resulting from the endowment effect might become ever more apparent if materialism indeed augments the endowment effect.

On the contrary, the distorting effect of a discrepancy between WTP and WTA may be less severe than is usually expected among low materialistic individuals as they may be less reluctant to exchange their belongings. Such a finding would not only enhance our understanding of the conditions under which an endowment effect is observed, it would also provide valuable insights in the economic consequences of the endorsement of a materialist lifestyle.

This paper presents three experiments in which evidence is found for the moderating role of material values in the occurrence of the endowment effect. Our results reveal an increasing endowment effect with increasing materialism, mainly due to materialists' tendency to demand high selling prices for their possessions. Little evidence is found for an endowment effect in individuals scoring low on materialism. Implications for our understanding of the endowment effect as well as theoretical and methodological implications for future materialism research are discussed.

The endowment effect

In a well-known experiment Kahneman, Knetsch, and Thaler (1990) distributed coffee mugs to half of the participants. Owners ("sellers") stated their minimum selling price for the mug, whereas non-owners ("buyers") indicated their maximum buying price for this item. On average, sellers demanded a substantially higher price than non-owners were willing to pay. Contrary to the common assumption that individuals have relatively stable preferences in the short-run, these findings imply that a person's preference for an object might change quickly as soon as he obtains ownership of it (Van Boven, Loewenstein, & Dunning, 2003). Evidence for a disparity between WTP and WTA (i.e., an *endowment effect*) was found in numerous studies in varied settings, e.g., lab experiments (Kahneman et al., 1990) and economic market experiments (Franciosi et al., 1996), using different types of endowments, such as candy bars (Kahneman et al., 1990; Morrison, 1997), wines (Mandel, 2002) or pens (Kahneman et al., 1990).

Thaler (1980) tied the endowment effect explanation of the disparity between WTP and WTA to Kahneman and Tversky's (1979) principle of loss aversion. According to this principle, the pain of giving up an object when it belongs to one's endowment outweighs the positive experience of gaining this object. Thus the value of an object increases when it enters a person's endowment, resulting in a steeper value function for the loss of this object than for its initial gain (Kahneman et al., 1990). Therefore, people tend to value their possessions more than alternatives of the same monetary value (Kahneman & Tversky, 1979; Tversky & Kahneman, 1991). As a result, a larger discrepancy between WTP and WTA is generally observed than might be expected under the standard economic theory of preference (Kahneman & Tversky, 1979; Kahneman et al., 1990; Strahilevitz & Loewenstein, 1998).

However, the endowment effect appears not to be as strong for everyone or in every circumstance. For instance, Strahilevitz and Loewenstein (1998) found evidence for a duration-of-ownership effect, which suggests that consumers adapt to ownership over time. The authors show that the value of an object increases with prolonged ownership and, as a result, its desired selling price augments as well. Not only the duration of ownership matters, but also the manner in which one obtains a good impacts the degree of WTP-WTA disparity. Evidence is found that an object is valued higher when it is acquired after a good performance than when it is acquired as a compensation for a poor performance or by chance (Loewenstein & Issacharoff, 1994).

Furthermore, the degree of the endowment effect may be influenced by individual characteristics, such as a person's regulatory focus (Liberman et al., 1999). Individuals with a prevention focus appear to be reluctant to exchange possessions, whereas individuals with a promotion focus are more open to changes and thus more willing to exchange endowments. Also, evidence is found for an effect of emotions in the occurrence of the endowment effect. For instance, Lin et al. (2006) found no endowment effect when

participants are induced to feel sad. Additionally, Lerner, Small, and Loewenstein (2004) found that sadness may even produce a reverse endowment effect (i.e., willingness to pay exceeding willingness to accept). Emotions may thus instigate a change in the cognitive perspective of buyers and sellers prompting them to focus on different aspects of the transaction (Ariely, Huber, & Wertenbroch, 2005).

Although it lies beyond the scope of this paper to provide a complete overview of moderators of the endowment effect, the results described above highlight the importance of emotions and other motivational factors, in addition to loss aversion, as determinants of the endowment effect. The current research aims to extend this line of research and proposes materialism as a moderator of the endowment effect.

Materialism as a moderating factor

Materialism is widely assumed to be a set of values and beliefs held by individuals who consider the accumulation of material wealth as essential to their life and well-being. (Burroughs & Rindfleisch, 2002; Richins & Dawson, 1992; Kasser & Ahuvia, 2002). Materialists tend to assume that acquiring possessions will buy them happiness and they judge their success in life as well as their satisfaction with life by the quality and status of their belongings (Richins & Dawson, 1992).

A material value orientation is known to have a wide range of adverse effects. Materialism, for instance, appears to be problematic for individuals' subjective well-being (Burroughs & Rindfleisch, 2002; Kasser & Ryan 1993) and for society in general through, among others, its negative relationship with ecological concern (Brown & Kasser, 2005). In addition, a material value orientation predicts excessive spending behavior and low saving behavior (Dittmar, 2005; Richins, 2011; Watson, 2003). An additional, economic implication of the endorsement of material values may be the augmentation of the WTP-WTA disparity. In other words, materialists' high valuation of goods and their tendency to retain ownership of their possessions suggest that a material value orientation may increase the endowment effect.

The notion that materialists find it hard to part from their possessions or even to share their belongings with others is inherent in the definition of materialism (Belk, 1984). Accordingly, a materialist might only want to exchange an endowment if a sufficiently high (monetary) compensation is guaranteed. We therefore propose that sellers (owners) scoring high on materialism are more reluctant to exchange endowments than sellers scoring lower on materialism.

It is less easy to predict how materialism relates to willingness to pay. On the one hand, evidence is found that people who strongly endorse material values tend to spend more money than their less materialistic counterparts (Dittmar, 2005; Watson, 2003). So, possibly materialistic buyers are more willing

to spend money on a not-owned-yet good relative to buyers low on materialism. On the other hand, however, one could expect that also materialists do not want to acquire possessions regardless of cost. In fact, buying prices may not necessarily increase with increasing materialism. After all, buyers (non-owners) have to give up one possession (money) in order to obtain another one (object) and previous research has shown that spending money may be perceived as a loss (Bateman et al., 1997; Munro & Sugden, 2003) or at least as a foregone gain of money (Tversky & Kahneman, 1991) and thus as a missed opportunity to purchase other, possibly more attractive goods. So, although materialists may like to possess products, there may be little reason to assume that they will spend considerably more money on a given item than a non-materialist, as both face the same trade-off between spending their money and keeping it for future purchases.

So, if anything, buying prices are expected to increase less steeply as a function of materialism than selling prices. As a result, even if materialistic buyers are more willing to spend money on a not-owned-yet good than less materialistic buyers, the endowment effect should be more pronounced for materialistic consumers than for less materialistic consumers. In sum, we assume that:

H1*: Materialistic sellers demand higher prices for an endowment than non-materialistic sellers.*
H2*: The difference between sellers' and buyers' prices (i.e., the endowment effect) increases with increasing materialism.*

Study 1

To test the hypothesis that materialism moderates the endowment effect, a first experiment was conducted. In an Internet survey participants were instructed to consider either selling or buying prices for a coffee mug. The difference between mean buying and selling prices constituted our measure of the endowment effect.

Method

Participants. One hundred eighty-nine 2nd year students (62 males) participated as part of a course requirement. They were randomly assigned to one of two Endowment Conditions: 88 students were assigned to the seller condition, 101 students were in the buyer condition. Participants received partial course credit for their contribution.

Procedure. First participants saw a coffee mug with the university logo printed on. They were instructed to consider that they could either buy (*buyer condition*) or sell (*seller condition*) this mug for a price of their choice. Next, they indicated the amount of money (in Euros and cents) they would give (buyer condition) or would want to get (seller condition) for the mug. Because this study was run online, participants' endowment with the mug was not factual. However, a similar endowment effect has been found for purely mental endowments as for real endowments (Carmon & Ariely, 2000; Carmon, Wertenbroch, & Zeelenberg, 2003; Liberman et al., 1999; Mandel, 2002; Sen & Johnson, 1997).

Subsequently, participants completed the Material Values Scale[1] (Richins & Dawson, 1992). The scale consists of 18 items, scored on a seven-point Likert scale anchored with *totally agree* and *totally disagree*. Scale items were averaged to form an index of materialism ($\alpha = .86$).

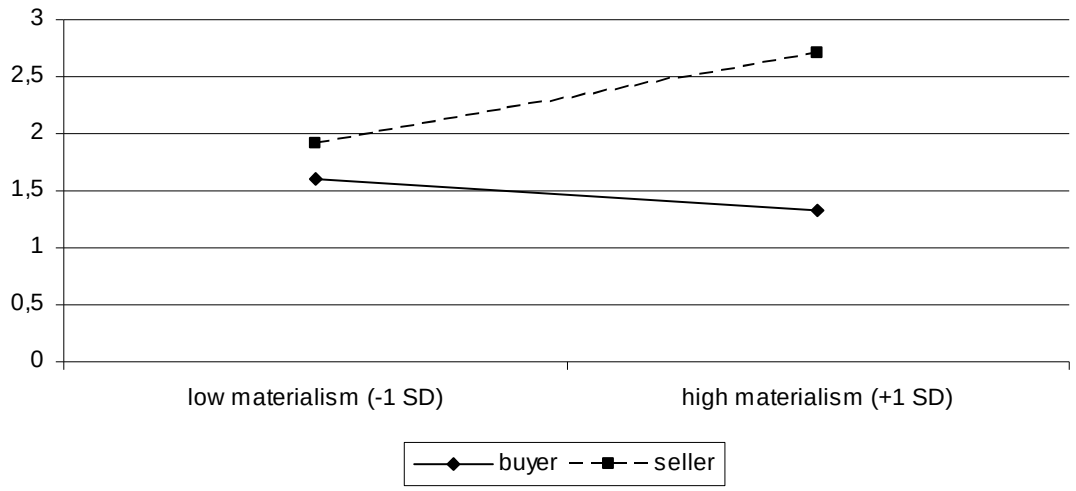
Results

Two outliers were removed (1.1% of the data). A particular buying or selling price X is identified as outlier if X < (Q1 - 1.5 x IQR) or X > (Q3 + 1.5 x IQR), where IQR = Q3 - Q1 is called the interquartile range (Tukey, 1977). Evidence was found for the endowment effect: buyers' maximum buying prices were significantly lower ($M_{\text{buying price}}$ = €1.49) than sellers' minimum selling prices ($M_{\text{selling price}}$ = €2.37), $t(185) = -4.04$, $p < .0001$.

To test the assumption that materialism moderates this endowment effect, participants' prices were regressed on three predictors: Endowment Condition (buyer vs. seller), Materialism and their interaction. No overall effect of Materialism on stated prices was found, $F(1, 183) = 1.41$, $p = .24$. However, the predicted interaction between Endowment Condition and Materialism was significant, $F(1, 183) = 5.97$, $p = .02$. The regression slope was significant for sellers, $t(183) = 2.55$, $p = .01$, but not for buyers, $t(183) = -.89$, $p = .37$. In addition, spotlight analysis (Aiken & West, 1991) revealed that the difference between buying and selling prices was significant for participants scoring high (1 SD above mean) on materialism, $t(183) = 4.43$, $p < .0001$, not for participants scoring low (1 SD below mean) on materialism, $t(183) = .98$, $p = .33$ (figure 1).

[1] *In none of the studies we found a significant effect of Endowment Condition (buyer vs. seller) on subsequent materialism scores.*

Figure 1. Prices (in euro) for sellers and buyers scoring low to high on materialism



In sum, study 1 suggested that materialistic sellers indeed demand higher prices for a good than less materialistic sellers. For buyers, no significant relationship between buying prices and materialism was found. Thus, the data support the hypothesis that materialism moderates the endowment effect (hypothesis 2). When individuals are more materialistic, a larger WTP-WTA disparity due to higher selling prices (hypothesis 1), and thus a stronger endowment effect is observed. In line with our predictions, these findings suggest that the endowment effect is most prevalent in highly materialistic individuals, whereas less evidence for an endowment effect is found in non-materialists.

Study 2

Although participants in the seller role in study 1 were endowed with a quite inexpensive and not particularly attractive object, a coffee mug, an endowment effect was observed and a relationship between materialism and selling prices was found. However, levels of materialism did not predict buying prices. The first objective of the second experiment is to test the robustness of this null result.

Possibly, the failure to obtain a relationship between materialism and buying prices may have been due to the type of product used in study 1. If a fairly unattractive object is offered for sale, it is likely that both individuals scoring low and high on materialism prefer the relatively superior option of not spending their money, such that both types of individuals indicate low willingness to pay. Hence, a relationship between materialism and buying prices may be observed only when buyers are offered a valuable and desirable object that is worth spending their money. In a second study, male participants are therefore

instructed to consider either buying or selling prices for six more expensive, technologically innovative gadgets that were rated to be attractive.

A second objective is to examine two factors related to materialism that might explain the moderation effect observed in study 1. Previous research identified an important role of emotions in the occurrence of the endowment effect (Lerner, Small, & Loewenstein, 2004; Lin et al., 2006). The endowment effect appears to be larger when positive emotions are elicited in participants than when negative emotions are prevalent. Consistent with this finding, it is possible that the presumed endowment with an object elicits more positive feelings in sellers who score high on materialism compared to sellers who score low on materialism. If this assumption holds, the influence of materialism observed in study 1 could be due to a differential mood effect (instead of being an effect of materialism per se).

Second, although Strahilevitz and Loewenstein (1998) found no evidence that differences in the desirability of an object between sellers and buyers could account for the endowment effect, this may change when materialism is taken into account. Based upon Richins and Dawson's (1992) theorizing, it is indeed plausible that materialistic individuals are more eager to possess all kinds of objects and therefore find anything more desirable to own. This would be consistent with the finding that the attractiveness of an object may depend on consumers' activated goals (Markman & Brendl, 2002). If an association between materialism and desirability of endowments would indeed exist and if this association would be stronger for sellers than for buyers, differences in desirability of the endowed object could explain the moderating effect of materialism on object valuation. A second experiment tests these potential explanations.

Method

Participants. Sixty-eight male students (M_{age} = 21.81, SD = 5.30) participated in the experiment. They were invited to the lab in groups of eight students at the time. They received a €6 participation fee. Participants were seated in separate cubicles so they would not interact with each other during the course of the experiment.

Procedure. Participants were randomly divided over two Endowment Conditions: half were assigned to the buyer role (*buyer condition*), the other half were sellers (*seller condition*). Participants received pictures and a short description of six gadgets (e.g., an iPod watch, a nano projector,… see appendix). As all participants were male, gadgets were selected that are likely to appeal to men. Participants answered two questions for each gadget.

A first question measured the endowment effect. Participants in both Endowment Conditions were presented with a list of twenty-four price intervals (ranging from "€0 - €5" to "> €450"). In the seller

condition, participants imagined that they received the gadget from an acquaintance who bought it abroad. They considered their minimum selling price for the object, given that someone would want to buy it from them. Buyers were told that an acquaintance bought the gadget abroad and offered them the chance to buy it. To avoid that restraints on their actual spendable budget would impact stated buying prices, participants were instructed to imagine that they had saved €8.000 in their bank account.

Prices were stated by choosing the desired price interval for each gadget. The lowest value of each chosen price interval is used to construct a price variable for each object. Although not reported, similar results are obtained when buying and selling price variables do not represent a continuous monetary value, but consist of the ranking number (1 to 24) of each price interval.

We applied a different measure of the endowment effect than in study 1 for two reasons. First, previous trials revealed that participants find it hard to come up with an exact price for an unfamiliar, rather expensive product. Because participants in the current study have to state prices for six products, we offered them the opportunity to choose one option in a list of price intervals in order to facilitate their task and to avoid incomplete responses. Second, the measure used in study 1 may be prone to extreme responses as there is no upper price limit (Reb & Connolly, 2007). The gadgets in the current study are more expensive, likely to yield higher selling or buying prices and more variance in prices than the coffee mug in study 1. Asking participants to choose one of the given price intervals adequately solves this potential outlier problem.

Next, for each gadget we measured its desirability. Participants stated on a seven-point Likert scale anchored with *not at all* and *very much* how much they would like to own each gadget.

To test whether self-reported mood states differed for more or less materialistic sellers and buyers, participants filled out the Positive Affect Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) using a five-point Likert scale anchored with *not at all* and *extremely*. Finally, participants completed the Material Values Scale (Richins & Dawson, 1992) as part of an internet survey two weeks prior to the experiment ($\alpha = .87$).

Results

Because every participant contributed six prices instead of just one price (as in study 1), the prices are not independent of one another. To deal with such data, basically two alternative analysis strategies exist: conducting repeated measures ANOVA or conducting multilevel regression analysis.

Multilevel regression analysis resembles ordinary regression analysis, but it adjusts the significance tests to take the repeated-measures nature of the data into account. The multilevel aspect refers to the fact that data are drawn from units at different levels (here: the participants constitute one level while the

price estimates for six different products, which are nested within participants, constitute another level). We choose to conduct multilevel analysis because it is more flexible: it not only allows testing whether the obtained effects differ across gadgets, but also enables us to adequately test competing explanations–in terms of mood and desirability–for the obtained effects.

Multilevel regression analysis requires a specification of the structure of the within-subject error variance-covariance matrix. The choice of the error variance-covariance structure can be guided using Chi Square tests and information criteria like AIC and BIC (Littell, Milliken, Stroup, Wolfinger, & Schabenberger, 2006). In all analyses, we used an unstructured error variance-covariance matrix, as this was superior to any reasonable alternative (compound symmetry or Huynh-Feldt structure) on all statistical criteria. However, alternative choices did not alter our conclusions.

In a first multilevel regression model, participants' gadget prices were regressed on three predictors: Endowment Condition (buyer vs. seller), Type of Gadget and their interaction. A main effect of Endowment Condition was found, $F(1, 66) = 52.79$, $p < .0001$, demonstrating a significant endowment effect. Significant effects on participants' gadget prices were found of Type of Gadget, $F(5, 66) = 85.15$, $p < .0001$, and the interaction between Type of Gadget and Endowment Condition, $F(5, 66) = 11.98$, $p < .0001$. This last interaction is not problematic as a significant endowment effect was found for each of the six gadgets (table 1).

Table 1. Mean endowment effect for the individual gadgets, interaction with materialism and regression slopes (se in brackets)

Gadget	Mean endowment effect (in €)		Endowment condition x materialism[a] (t-value)	Slope sellers		Slope buyers	
Walkie Talkie watches	64.06***	*(9.79)*	2.97**	26.66**	*(8.99)*	-15.48	*(11.02)*
Wireless Mouse	48.74***	*(8.26)*	1.94†	17.01*	*(7.60)*	-6.31	*(9.33)*
Nano Projector	135.49***	*(18.87)*	.51	28.96	*(18.90)*	13.71	*(23.11)*
Keychain with screen	19.22***	*(2.82)*	2.24*	9.88**	*(3.68)*	-3.17	*(4.59)*
Memory stick	21.59***	*(3.48)*	3.07**	10.35**	*(2.98)*	-4.09	*(3.70)*
iPod watch	75.45***	*(16.07)*	2.05*	45.85**	*(16.28)*	-5.32	*(18.94)*

[a]Interaction effects controlled for desirability of the individual gadget and positive and negative affect; † $p < .06$; * $p < .05$; ** $p < .01$; *** $p < .0001$

In a second multilevel regression model, we added Materialism, Desirability, and Mood as predictors as well as all the two-way and three-way interactions between Materialism, Type of Gadget and Endowment Condition. Materialism was added to the model in order to test our main hypothesis that materialism moderates the endowment effect. Levels of positive and negative affect were included to investigate whether the relation between materialism and the endowment effect is due to a differential mood effect (i.e., due to a relation between materialism and mood for sellers but not for buyers). Desirability of the gadgets was added to the model to test whether the moderating effect of materialism is actually due to an increased desirability of the gadgets in materialistic sellers, compared to non-materialistic sellers and materialistic and non-materialistic buyers.

Materialism did not reliably predict overall prices, $F(1, 62) = 2.37$, $p = .12$, but a significant interaction was found between Endowment Condition and Materialism, $F(1, 62) = 4.36$, $p = .04$. This interaction was, however, not as pronounced for each gadget, $F(5, 62) = 2.91$, $p = .02$. Table 1 presents the interaction effects and regression slopes for the individual gadgets. Note that for each individual gadget the slopes for sellers were steeper than for buyers, although the interaction between Endowment Condition and Materialism was not significant for the nano projector. However, for all the other gadgets the interaction was significant.

So, overall, we replicated the interaction between Materialism and Endowment Condition observed in study 1, even when the model controlled for mood and desirability of the object. This suggests that materialism predicts selling prices and not buying prices and that the influence of material values cannot be attributed to a mood effect, although high materialistic participants in general tended to experience less positive affect, $F(1, 64) = 6.04$, $p = .02$, or to differences in product desirability across low and high materialistic sellers. Desirability significantly predicted buying and selling prices, $F(1, 62) = 104.43$, $p < .0001$. Nonetheless, differences in desirability between low and high materialistic sellers could not account for the effect of materialism on selling prices. In fact, regressing the desirability of the gadgets on Endowment Condition, Materialism and their interaction failed to produce significant effects of Materialism, $F(1, 64) = 1.45$, $p = .23$, Endowment Condition, $F(1, 64) = .16$, $p = .69$, or the interaction between both, $F(1, 64), =. 06$; $p = .81$. The desirability of the gadgets thus did not vary between sellers and buyers, nor did it vary between participants scoring low and high on materialism. More importantly, there was no evidence at all for a stronger link between materialism and gadget desirability for sellers than for buyers.

In sum, this study replicated the findings of the first experiment. Although an overall endowment effect was observed, materialism moderated this effect (hypothesis 2). Materialistic sellers demanded higher prices for possessions than less materialistic sellers did (hypothesis 1). No relationship was found between material values and buying prices, even when participants were offered more attractive and

valuable objects. Additionally, the current experiment ruled out two potential explanations for the observed relation between materialism and the endowment effect. The impact of materialism on selling prices could not be attributed to an increased desirability of endowments in materialistic sellers, or to differences in affect between more and less materialistic participants. This supports our prediction that materialism itself accounts for the observed effects.

Study 3

The previous studies provided evidence that materialism moderates the endowment effect. To provide an even stronger case for our hypotheses, an increased endowment effect should be observed when levels of materialism are experimentally boosted. Several studies indicate that increasing consumers' awareness of their death (i.e., make their mortality more salient) temporarily increases materialistic aspirations. For instance, Mandel and Heine (1999) found that mortality salience increased preferences for luxury brands over non-luxury brands. Kasser and Sheldon (2000) found that mortality salience increased feelings of greed and lead to higher aspirations for future earnings.

The association between death-related thoughts and materialism is theoretically grounded in terror management theory (Greenberg, Pyszczynski, & Solomon, 1986). According to terror management theory, people attempt to cope with the awareness of their transience through the creation of and belief in cultural worldviews. Living up to these culturally shared conceptions of reality helps people to sustain their self-esteem and to provide their lives with a sense of (shared) meaning.

In most capitalist cultures, the acquisition of wealth and the consumption of material goods are promoted as legitimate and satisfying pathways to a successful and meaningful life or even to immortality (Solomon, Greenberg, & Pyszczynski, 2004). Consequently, terror management theory predicts that members of these societies who are confronted with the prospect of their death will augment their materialistic pursuits in an attempt to bolster their self-esteem and to give meaning to their life within their cultural context (Kasser & Sheldon, 2000). In line with this reasoning, we predict an increased endowment effect after a mortality salience induction.

In addition, we predict that the increase in endowment effect will be stronger for consumers who endorse material values to a higher extent prior to the induction of death related thoughts. Based on their own opinion about the value of (acquisition of) products, materialistic individuals may overestimate the importance of material goal pursuit in a given society (cf. false consensus effect, e.g., Ross, Greene, & House, 1976). Also, Arndt, Solomon, Kasser, & Sheldon (2004, 204) argue that: "because awareness of death instigates efforts to augment self-esteem, concerns about mortality should often intensify

materialistic desires in people for whom such pursuits are a salient barometer of self-worth." In other words, the effect of mortality salience on the endowment effect should be more pronounced for materialistic consumers than for less materialistic consumers. Statistically, this should be evidenced in a three-way interaction between Endowment Condition (seller vs. buyer), Materialism, and Mortality Salience Condition (salient vs. not salient).

Method

Participants. Three hundred and seven 1st year students (102 males) participated in the experiment as part of a course requirement. They were randomly divided over two auditoria and received an extra credit for their participation. Two experimenters were present in each auditorium to ensure participants would not interact during the course of the experiment.

Procedure. Participants first completed the Material Values Scale (Richins & Dawson, 1992, α = .84). Ten participants did not complete the questionnaire and were removed from the dataset. Then participants were randomly instructed to write a short essay about their own death (*mortality salience condition*, N = 121), about their favorite music (*control condition 1*, N = 86), or about a visit to the dentist (*control condition 2*, N = 90). In previous research both types of control conditions have been compared with a mortality salience condition (music: Kasser & Sheldon, 2000; dentist: Mandel & Smeesters, 2008). However, it is likely that both control tasks elicit different emotions. Given the importance of emotions in the occurrence of the endowment effect (Lerner et al., 2004; Lin et al., 2006), we included and compared both control conditions. Ten participants refused to think about their death and were removed from the dataset.

After a number of unrelated tasks, *sellers* (N = 110) were endowed with a small gadget called *clicker* whereas *buyers* (N = 177) were not. The clicker was distributed in 2006 by Unilever brand AXE® to support the release of AXE Click®, a new line of shower gel and deodorant. Participants were informed that they would have the chance at the end of the session to exchange clickers with other participants. They indicated how much money they would give (buyers) or would want to get (sellers) for the clicker.

Results

Five outliers were removed (1.7% of the data). Outliers were identified according to the same procedure as applied in study 1. Buyers demanded significantly lower prices for the clicker ($M_{\text{buying price}}$ = €0.56) than sellers ($M_{\text{selling price}}$ = €2.68), $t(280) = -8.55$, $p < .0001$. Moreover, being in control condition 1

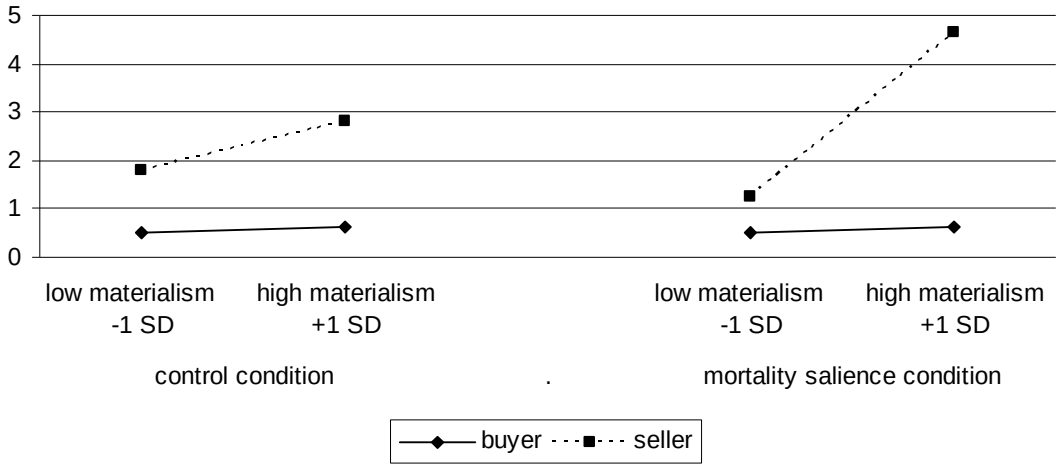
(music) compared to control condition 2 (dentist) did not affect selling or buying prices, $F(1, 167) = .26$, $p = .61$, nor did it interact with Endowment Condition (buyer vs. seller), $F(1, 167) = .36$, $p = .55$. We therefore collapsed both control conditions and treated them further as one control condition.

To test the prediction that the endowment effect is moderated by materialism and that this moderation is reinforced when mortality is salient, a general linear model (GLM) analysis was conducted with Endowment Condition (buyer vs. seller) and Mortality Salience Condition (salient vs. not salient) as between subjects factors and Materialism as a covariate; all possible interaction variables were also included. The overall endowment effect was still significant when Materialism and Mortality Salience were included in the model, $F(1, 274) = 5.82$, $p = .01$, and Materialism significantly predicted overall prices, $F(1, 274) = 17.96$, $p < .0001$. In line with our previous findings, the interaction between Endowment Condition and Materialism was significant, $F(1, 274) = 14.39$, $p = .0002$. Although the difference between buying and selling prices was significant both for participants scoring low (-1 SD) $t(274) = -2.74$, $p = .007$, and high (+1 SD) on materialism, $t(274) = -8.79$, $p < .0001$, the regression slope was significant for sellers, $t(274) = 4.80$, $p < .0001$, but not for buyers, $t(274) = .41$, $p = .69$. So, overall, the endowment effect increased with increasing materialism.

Concerning the mortality salience induction, the analysis yielded a marginally significant interaction between Mortality Salience Condition and Endowment Condition, $F(1, 274) = 3.62$, $p = .058$. Sellers demanded higher prices for the clicker when thoughts about their death were made salient ($M_{\text{mortality salience condition}}$= €3.02 vs. $M_{\text{control condition}}$= €2.33), $t(274) = 1.80$, $p = .071$, while buying prices ($M_{\text{mortality salience condition}}$= €.58 vs. $M_{\text{control condition}}$= €.55) did not differ between both conditions, $t(274) = .11$, $p = .92$. However, more importantly, the data reveal the predicted three-way interaction between Endowment Condition, Mortality Salience Condition, and Materialism, $F(1, 274) = 4.57$, $p = .03$.

We previously found that the level of material values significantly predicted selling prices, but did not affect buying prices. In the mortality salience condition, relative to the control condition, the data show a similar yet more pronounced pattern (figure 2). The more a participant endorsed material values prior to the mortality salience induction, the more pronounced the resulting materialistic behavior in terms of stated selling prices, relative to stated selling prices in the non-salient control condition. So, the mortality salience manipulation increased the slope of materialism for sellers, but not for buyers. Indeed, the slope for sellers was significantly different between both Mortality Salience Conditions, $t(274) = 2.56$, $p = .01$, while the slope for buyers was not, $t(274) = .00$, $p = .99$.

Figure 2. Prices (in euro) for sellers and buyers scoring low to high on materialism in the control and mortality salience condition



Based on the theoretical and empirical evidence that reminding consumers of their own mortality reinforces materialistic behavior, we proposed that materialistic sellers who are reminded of their death would demand higher prices for an endowment relative to materialistic sellers with less threatening thoughts. Study 3 found support for this prediction. Indeed, experimentally increasing the importance attached to pre-existing material values resulted in an increased endowment effect. Similar to studies 1 and 2, no relationship between materialism and buying prices was found. Additionally, in this experiment we used a real product instead of imagined endowments. This procedure yielded similar results as the "mental endowment" procedure applied in the previous studies.

General discussion

People generally ask more money to give up one of their possessions than they are willing to pay to obtain this object (Thaler, 1980). Previous research identified a number of moderators of this endowment effect (Liberman et al., 1999; Lin et al., 2006; Loewenstein & Issacharoff, 1994; Strahilevitz & Loewenstein, 1998)–for an overview see also Ariely et al. (2005). This paper extends this line of research by proposing materialism as an additional moderator.

In three experiments, we found evidence that materialistic individuals demand higher prices for their belongings than less materialistic individuals. Materialists show more attachment to their possessions–even when ownership is merely imagined–resulting in a larger discrepancy between selling

and buying prices for the same good. Although material values predict selling prices, materialism has no predictable impact on buying prices.

Additionally, we explored the possibility that materialists feel happier than non-materialists in the moments after they are endowed with a good, especially when they really desire to own it. Yet, the influence of materialism on selling prices was not mediated by positive or negative mood states. Neither was the effect of materialism on selling prices due to an increased desire to own products in materialistic sellers relative to less materialistic sellers, which supports our assumption that the endorsement of a material value orientation itself accounts for the patterns observed in selling prices.

These findings confirm that the consequences of the endowment effect may be particularly pronounced in highly materialistic individuals. However, quite the opposite may be true for less materialistic individuals. Fairly little evidence for a WTP-WTA discrepancy was found in individuals who do not emphasize the importance of accumulating wealth in their life. Accordingly, one might argue that, on average, participants should endorse a material value orientation to a certain degree in order to obtain an endowment effect. Since participant samples in experiments are usually not selective with respect to their level of materialism, it may be assumed that this criterion was met in earlier experiments reporting a consistent discrepancy between WTP and WTA. An opportunity for further research might be to explicitly select consumers with very low or very high materialism scores and to engage both groups of consumers in a market experiment in which they can either buy a good from someone else or sell it. Based on our findings, we would predict that significantly more transactions will take place in the low materialism condition, due to the lower reluctance to exchange goods in low versus highly materialistic sellers. A similar result may be found when materialism is experimentally primed. In fact, it might also be worth exploring the possibility of a decreased or even reversed endowment effect with a manipulation which is assumed to instigate the opposite of materialism. For instance, material and religious values may be conflicting (Burroughs & Rindfleisch, 1992) and priming people with concepts related to *God* may instigate prosocial behavior (Shariff & Norenzayan, 2007). Analogously, priming participants with religious concepts may eliminate or even reverse the endowment effect.

The implications of materialism in the occurrence of the endowment effect enhance our insight in this effect, and, in doing so, also advance our understanding of the nature of the construct *materialism*. So far, the bulk of research on the behavioral consequences of materialism has mainly focused on spending tendencies and intentions of prospective buyers. Materialism is associated with short-sighted spending behavior, including overspending and debt (Dittmar, 2005; Richins, 2011; Watson, 2003), and high aspirations for possessions and wealth (Kasser & Ryan, 1996; Kasser & Sheldon, 2000). However, our data suggest that materialists do not necessarily want to have everything regardless of cost. If that were the case, a relationship between materialism and buying prices should have been obtained. In contrast, across

three experiments using different objects, no significant relation between materialism and willingness-to-pay was obtained. This suggests that, at least in the current experiments, materialistic participants (relative to less materialistic participants) did not overestimate the value of the objects that we used.

It makes sense that materialistic buyers do not necessarily want to spend more on a given item than their non-materialistic counterparts. After all, spending too much on any given item implies that one has less money left to spend on other items. In other words, spending too much on any given item implies unduly reducing one's capacity to accumulate possessions. In the current studies, all the action appears to reside with the owners of objects, the sellers. Materialistic sellers demand higher prices than non-materialistic sellers, even when cheap or quite unattractive objects are traded. Clearly, on many occasions people act as sellers in economic transactions with others. However, to our knowledge little is known about materialists' behavior in this context. Our research implies that materialism might have important implications for the supply-side of market relations.

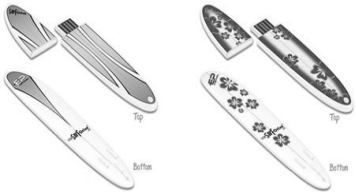
Apart from their theoretical contribution, our findings may also have a methodological implication for future materialism research. Two commonly administered materialism scales are the scales of Belk (1985) and Richins and Dawson (1992). Belk's scale measures personality traits related to materialism and Richins and Dawson conceptualize materialism as an enduring value. Both scales are designed to measure fairly stable characteristics or life orientations. Yet, a sensitive instrument measuring temporal fluctuations in material values, for instance induced by an experimental manipulation, may be particularly valuable given the extant research attention devoted to the antecedents of materialism.

One attempt to design a state materialism scale was made by Chang and Arkin (2002). They adapted the eighteen items of the original Richins and Dawson (1992) scale, such that each scale item referred to participants' momentary materialistic feelings. However, a quick look at the articles citing Chang and Arkin (2002) shows that their adapted scale has not been frequently applied to measure state materialism, possibly due to the length of the instrument or the obvious reference to materialism in the items. If one aims to measure participants' state materialism after an experimental manipulation, it may be interesting to use a more subtle measure. Our findings show that the results of a fairly simple task in which participants are instructed to state selling prices for a number of real or imagined endowments may provide a reasonably accurate indication of the importance someone attaches to acquisition and material possessions at a certain point in time. We thus suggest that willingness to accept could be used as a sensitive measure of participants' momentary (salience of) material values (i.e., state materialism). An advantage of this measure would be that data on WTA can be collected easily without demanding much effort from participants. Moreover, demand effects or socially desirable responses (cf. Mick, 1996) may be reduced with this measure, as the purpose of the task (i.e., measuring state materialism) is not immediately apparent.

Despite the contribution of the current paper to the understanding of the endowment effect, our findings hold challenges for future research, for instance with respect to the relationship between materialism and buying prices. We provided a plausible explanation for the failure to obtain a relationship between materialism and buying prices in the current experiments. It appears that non-owners or buyers were faced with a less straightforward trade-off between spending money on a good and keeping the money. Future research may empirically address the type of considerations driving this decision making process of materialist and non-materialist buyers. Moreover, certain contexts, like exposure to advertising for luxury products, may prompt individuals to focus on missed purchase opportunities if they decide to spend their money on other (non-luxury) goods. Such circumstances might as well elicit an increasing endowment effect with increasing materialism, yet due to a negative relationship between buying prices for a good and materialism instead of a positive relationship between materialism and selling prices as was found in the current experiments. Additional research might unveil such circumstances in which a relationship between materialism and buying prices can be found.

Finally, based on the definition of materialism and prior theorizing about the endowment effect we assumed that materialists ask higher selling prices for their endowments because they are more attached to them. However, we cannot rule out that materialists simply want to make more profit out of the transaction and therefore ask a higher selling price. Such a finding would confirm the prediction of Brown (2005) that individuals in a seller role mainly seek to make a good deal out of the transaction, instead of being loss averse. So, future research could explore further which element of the transaction guides materialists' (selling) price decisions: the object itself or the money involved in the transaction (cf. Carmon & Ariely, 2000).

Appendix 1. **Gadgets study 2**

Walkie Talkie watches		Memory stick	
Wireless Mouse		Keychain with screen	
Nano Projector		iPod watch	

ESSAY 2:

MATERIALISM, (WOMEN'S) CONSPICUOUS CONSPUMPTION, AND THE HUMAN MATING GAME

Abstract

This essay examines the interplay between men's reliance on conspicuous consumption as a mating strategy and women's engagement in status-signaling consumption. In studies 1 and 2 we show that materialistic men interpret a woman's conspicuous consumption as a signal that she requires high financial standards from prospective partners, which renders these men uncertain about the effectiveness of their mating efforts. Findings of a third study (involving real-life interactions between men and a female confederate who either engaged in conspicuous consumption behavior or not) suggest that women's conspicuous consumption behavior may also have concrete implications for materialistic men's behavior and for their evaluation of an interaction.

Introduction

People are concerned with their status, in other words, with their relative position within their society or reference group (Solnick & Hemenway, 1998). The possession of status is valued intrinsically (Huberman, Loch & Önçüler, 2004), feels good (Ivanic & Nunes, 2009), and is related to access to a host of valuable resources (Keltner, Gruenfeld & Anderson, 2003). Although one may gain status in many different ways (e.g., through one's intelligence or competence), individuals may attempt to signal their status through their possessions (Belk, Bahn & Mayer, 1982)–in particular their number of luxurious and exclusive possessions (Frank, 1999). The pattern of consumption aimed at acquiring status has been labelled *conspicuous consumption* (Veblen 1899/1994).

For men, conspicuous consumption may have particularly important benefits in a mating context. For instance, women have evolved a preference for partners who possess status (Colarelli & Dettmann, 2003; Kenrick, Sadalla, Groth, & Trost, 1990). In response to this preference, men have developed an interest in conspicuous consumption to attract female mating partners (Griskevicius et al., 2007; Janssens et al., 2011; Sundie et al., 2011). While, from this perspective, acquiring and displaying status seems to have a higher payoff for men than for women, this does not preclude women from consuming or displaying all kinds of luxurious products (e.g., designer shoes, fancy cars, or all kinds of technological devices) which may also signal status. However, in contrast to men, it is less clear how women's engagement in conspicuous consumption behavior is perceived or reacted to, especially by men.

Hence, the current paper aims to provide more insight in the interplay between men's reliance on conspicuous consumption as a mating strategy and women's own engagement in status-signaling consumption. Specifically, we propose that men may display less affiliative behavior when interacting with a woman who engages in conspicuous consumption behavior, especially if her consumption behavior is interpreted as a signal of high required male mate value. However, we predict that these effects will not occur for all men. Given materialists' strong concern with luxury consumption and status (Richins, 1994b; Richins & Dawson, 1992), we propose that materialistic men (compared to men scoring low on materialism) will react more strongly to women's conspicuous consumption.

Evolution, reproduction, and conspicuous consumption

Men and women invest time and effort in selecting and attracting an appropriate mating partner. However, due to differences in reproductive potential, both sexes have evolved different strategies to attain their reproductive goals (Bjorklund & Shackelford, 1999; Kenrick, Sadalla, Groth, & Trost, 1990).

There are few physiological limitations to the number of children a man is able to produce. Hence, men benefit from attracting as many as possible women who appear healthy and physically attractive–indicators of fertility (Buss, 1989; Buss & Schmitt, 1993; Kenrick & Keefe, 1992)–to increase their reproductive success (Buss & Schmitt, 1993; Grammer, Renninger, & Fisher, 2004; Schmitt, 2005; Simpson & Gangestad, 1991). Women, on the other hand, have a shorter reproductive life-span and they typically devote more time and effort on their offspring (e.g., gestation, breastfeeding, nursing the infant,…) than men. Consequently, women tend to be choosier in selecting their preferred mate (Bjorklund & Shackelford, 1999; Buss, 1989; Trivers, 1972).

Specifically, women in a long-term mating mindset tend to prefer partners who are willing and able to invest maximally in their partner and offspring (Geary, 2000). Because adequate economical resources serve as a potent investment cue (Hill & Buss, 2008), women are particularly likely to favor men with (financial) resources (Colarelli & Dettmann, 2003; Kenrick, Sadalla, Groth, & Trost, 1990; Li, Bailey, Kenrick, & Linsenmeier, 2002). When in a short-term mindset, women may also be interested in men's resources. In particular men's engagement in conspicuous consumption behavior (i.e., spending financial resources on flashy consumption) may be interpreted as a valuable signal of underlying (genetic) quality (Sundie et al., 2011). In response to this, men in a (short-term) mating mindset have evolved an interest in status-signaling products (Griskevicius et al., 2007; Janssens et al., 2011; Sundie et al., 2011).

Women's conspicuous consumption and (relative) mate value

Evidence suggests that the process of selecting and attracting desirable mating partners is influenced by complex calibration mechanisms which help individuals to reduce the number of potential partners to a smaller subset of prospective partners whose perceived mate value is comparable to their own mate value. For instance, it has been shown that men are most sensitive to subtle variations in women's attractiveness for those women who are of similar perceived mate value (Bailey, Durante, & Geary, 2011). Also, women who perceive themselves as higher in mate value impose higher minimum standards in what they require of a long-term partner (Regan, 1998) and women who think of themselves as being more physically attractive have a stronger preference for symmetrical male faces (Feinberg et al., 2006).

Comparing one's own value (e.g., for a man: his status) to the perceived mate value of a potential partner (e.g., a woman's attractiveness) has two advantages (Bailey, Durante, & Geary, 2011). First, it reduces the cost of spending effort on a mate which offers relatively little reproductive rewards (if one would select a mate of lower mate value). Second, it avoids wasting time and energy on ineffective mating

efforts (if one would attempt to attract a partner whose mate value is too high or who desires a partner with higher mate value than one's own perceived mate value). In theory, women's conspicuous consumption could influence the outcome of this calibration process in two ways. First, flaunting status products could affect women's mate value (as perceived by men). Second, it might affect men's assessment of their own mate value.

Little empirical evidence points in the direction of the first possibility, however. While signaling status through possessions appears to enhance men's perceived mate value, no such evidence has been found for women. In fact, women's conspicuous consumption does not seem to affect their desirability to the opposite sex in any direction. More specifically, status products do not directly improve women's physical appearance (Dunn & Searle, 2010), which is their most important mate value (Buss, 1989). On a more indirect level, women consuming status products do not receive more attention (DeWall & Maner, 2008), and financial expenditures of women are not related to their mating intentions or mating success (Kruger, 2008).

The second possibility has received substantially less research attention. Men may interpret a woman's conspicuous consumption as a signal that she requires high financial standards of potential mating partners. After all, prior research has shown that women who are more financially successful–of which conspicuous consumption may be a signal–also desire mates with more financial resources (Buss, 1989). In other words, men may interpret women's conspicuous consumption as a form of *resistance* (e.g., Chapman, Arnqvist, Bangam, & Rowe, 2003) indicating that she may be more inclined to mate with a partner who can live up to her elevated (financial) standards.

If this is true, the following assumptions could hold as well. Specifically, a woman's conspicuous consumption may lead men to believe that they will need to be more persistent in exerting mating effort (specifically in displaying signals of financial prosperity) if they want to attract her. As a result, men may be less confident about the effectiveness of their mating efforts, which, in turn, might translate into a decrease in their display of affiliative behaviors. After all, it seems inefficient for a man to put effort in establishing a warm and friendly relationship with a woman when she appears to signal that he runs a high risk of being rejected.

In sum, we predict that women's conspicuous consumption may affect men's assessment of relative mate value. More specifically, we predict that women's conspicuous consumption will decrease men's confidence in the effectiveness of their mating efforts. This, in turn, may affect men's behavior in an actual interaction situation, such that men will display less affiliative behavior when interacting with a woman who conspicuously flaunts status products. However, as we will argue, we predict that these effects are particularly likely to occur when women's conspicuous consumption is perceived and evaluated by materialistic (as compared with non-materialistic) men.

Materialism and (women's) conspicuous consumption

Not all men are equally inclined to engage in conspicuous consumption behavior when their mating goals are activated (e.g., Sundie et al., 2011; see also essay 3b). Likewise, not all individuals may attach the same symbolic meaning to possessions or be equally sensitive to the signals of status embedded in the consumption of certain products. To take this into account, we consider the possibility that materialism functions as a moderator of the effects proposed in this paper.

Materialism is generally conceptualized as a value endorsed by individuals who believe that it is impossible to achieve desired end states, such as status or happiness, without acquiring adequate possessions (Burroughs and Rindfleisch 2002; Fournier & Richins, 1991; Richins & Dawson, 1992). These beliefs in turn influence individuals' (consumption) behavior and preferences, often in a negative way (e.g., Belk, 1985; Brown & Kasser, 2005; Burroughs & Rindfleisch, 2002; Dittmar, 2005; Kasser & Ryan, 1993; Richins & Dawson, 1992; Watson, 2003).

Especially relevant to this paper is the finding that materialistic individuals are typically strongly concerned with the symbolic meaning of products, in particular status products (Richins, 1994b). Indeed, materialistic individuals are inclined to incorporate the perception of others in their choice of products and they reveal a preference for products which are visible to others, luxurious, and prestigious (Richins, 1994a, 1994b; Wong & Ahuvia, 1998). Hence, materialistic individuals, rather than individuals with lower levels of materialism, are attuned to paying attention to the symbolic cues of status which may be communicated with possessions. Consequently, materialists are likely to engage in conspicuous consumption behavior to display or achieve status (Richins, 1994a; Wong, 1997), and possibly also to react stronger to other individuals' consumption of status products. Hence, we expect that particularly materialistic men will be inclined to interpret women's conspicuous consumption as a signal of high required financial standards for potential mating partners. As a result, we expect that materialistic men, as compared with non-materialistic men, will react stronger and more negatively to women's conspicuous consumption behavior in a real interaction situation.

Overview of studies

In three studies we aim to shed more light on the complex relationships between men's reliance on status-signaling products to attract women, and women's own engagement in conspicuous consumption behavior. In studies 1 and 2 we show that women's status consumption is interpreted by men, especially when they are materialistic, as a signal of high (financial) standards for potential mates. As a result,

materialistic men are shown to be less confident about the effectiveness of their mating efforts. In studies 2 and 3, we additionally show that this may (negatively) affect their behavior when interacting with a woman who is surrounded with status-signaling products. While the interaction is scenario-based in study 2, study 3 involves real interactions.

Study 1

Method

Participants. One-hundred eighteen male students varying in age from 17 to 24 years (M_{age} = 19.08, SD = 1.28), participated in an online experiment in return for partial course credit.

Procedure. Participants were randomly assigned to one of two Consumption Conditions: a conspicuous consumption condition and a non-conspicuous consumption condition. In both conditions participants were asked to imagine that they attended a party at which they met a young woman. Participants were told that they saw the woman arriving at the party in either a convertible (*conspicuous consumption condition*) or in a regular, middle class car (*non-conspicuous consumption condition*). In addition they were shown a picture of the women. In the conspicuous consumption condition, an expensive brand logo was visible on her shirt, while the logo was removed in the non-conspicuous consumption condition. We instructed participants to form an impression of the depicted women based on the available information.

Next, the participants indicated on a ten-point scale anchored with *very little* and *very much* how much a man should possess minimally of each of four characteristics (intelligence, financial resources, humor, physical attractiveness) before this woman would consider him as a potential partner. All four characteristics have proven to be at least moderately important for women in prospective partners (Kenrick et al., 1990). We predict that materialistic men will be inclined to believe that the depicted woman requires more financial resources (but not necessarily more of other characteristics) of a prospective partner in the conspicuous consumption condition as compared with the non-conspicuous consumption condition. To test this moderating effect of materialism, participants filled out the Material Values Scale[2] (Richins & Dawson, 1992) after a number of unrelated tasks. Scale items were averaged (α = .85) to form an index of participants' level of materialism.

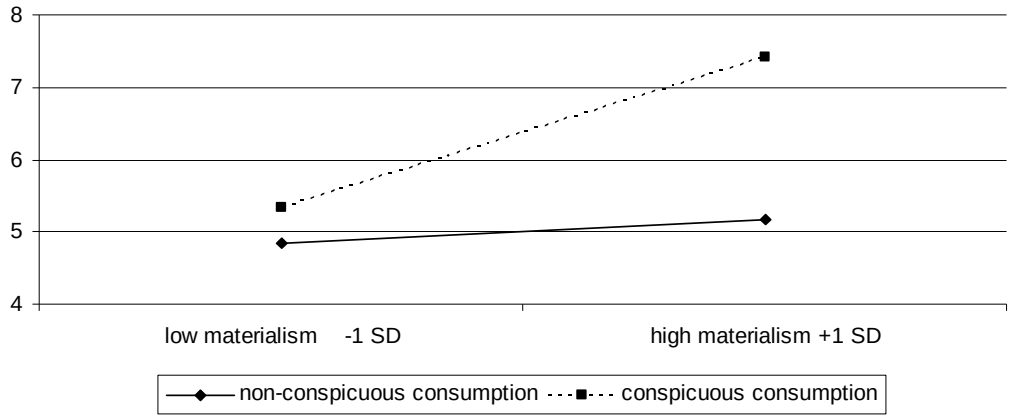
[2] *In none of the studies we found a significant effect of our manipulations on participants' materialism scores.*

Results

Financial resources. A GLM analysis with Materialism and Consumption Condition as between-subjects factors revealed a significant main effect of Consumption Condition, $F(1, 114) = 19.06$, $p < .0001$, as well as of Materialism, $F(1, 114) = 14.63$, $p = .0002$, on expected required financial resources.

Overall, men in the conspicuous consumption condition (compared to men in the non-conspicuous consumption condition) expected that the depicted woman required more financial resources from a potential partner and expectations about required financial resources increased with increasing materialism. However, these main effects were qualified by a significant interaction effect between Materialism and Consumption Condition, $F(1, 114) = 7.59$, $p = .007$ (figure 3).

Figure 3. Expected required financial resources



Spotlight analysis (Aiken & West, 1991) revealed that the difference in required financial resources was significant for participants scoring high (1 SD above the mean) on materialism, $t(114) = -5.04$, $p < .0001$, but not significant for participants scoring low (1 SD below the mean) on materialism, $t(114) = -1.10$, $p = .27$. In addition, the regression slope was significant in the conspicuous consumption condition, $t(114) = 4.46$, $p < .0001$, but not in the non-conspicuous consumption condition, $t(114) = .79$, $p = .43$.

Other characteristics. The interaction between Materialism and Consumption Condition was significant for none of the remaining three characteristics, all Fs < 1.95, all ps > .16. Only for the expected requirements with respect to a partner's physical attractiveness we found a significant main effect of Materialism, $F(1, 114) = 7.76$, $p = .006$. Across conditions, expectations about the depicted woman's

required level of physical attractiveness in a prospective male partner increased with increasing materialism.

Discussion

Study 1 confirmed that a woman's conspicuous consumption behavior may be perceived differently depending on the level of materialism of the (male) perceiver. In particular, we found that materialistic men tend interpret a woman's engagement in status-signaling consumption as a signal that she requires (evidence of) more financial resources from a man before she would consider him as a potential partner. This suggests that materialistic men feel that they will need to exert more (monetary) effort if they want to attract a woman who engages in conspicuous consumption behavior and therefore possibly expect to have a lower chance to be actually able to attract this woman. Study 2 tests this prediction more directly.

In addition, we proposed that women's conspicuous consumption may also (negatively) affect the non-verbal behavior of materialistic men. In study 2 we will additionally test whether materialistic men show less affiliative behavior in a hypothetical interaction with a woman who flaunts status products. Specifically, we test whether materialistic men keep more interpersonal distance.

Study 2

Method

Participants. Seventy-nine male students varying in age from 18 to 24 years (M_{age} = 19.30, SD = 1.38) participated in the experiment in return for partial course credit. The experiment was run online. Eight participants were excluded from the analyses because they did not comply with the instructions.

Manipulation. Participants were randomly assigned to read one of two scenarios about a hypothetical interaction situation with a woman who either engaged in conspicuous consumption behavior (*conspicuous consumption condition*) or not (*non-conspicuous consumption condition*).

More specifically, participants imagined themselves walking through the city park where they met a woman. Information about the female interaction partner was kept constant between both Consumption Conditions. The difference between both conditions pertained to whether the woman was depicted to consume branded status products or not. In contrast with study 1, we provided fairly detailed background information about different aspects of the depicted woman's appearance, hobbies and character to better disguise the purpose of the experiment (and thus to eliminate potential demand effects).

All participants read that their female interaction partner was a relatively intelligent student in applied economics. She was described to have a normal social life, a regular body posture, and to be moderately attractive with brown hair and blue eyes. In the conspicuous consumption condition, she was additionally described as wearing nice clothes with visible brand names. It was also mentioned that she carried a car key from a BMW. In the non-conspicuous consumption condition, the woman was described as wearing nice clothes without visible brand names and holding an ordinary bike.

Measures. After reading the scenario, a sketch of the park and the female interaction partner appeared on the computer screen (see appendix 2). The interaction partner had already been located in the middle of the drawing, facing to the left. She was given a fairly neutral body posture and no facial expression. Participants were asked to complete the drawing of the interaction as it occurred in their imagination. Specifically, they were instructed locate a second figure (the participant's avatar) in the drawing, opposite the female interaction partner. Participants were told that this would help them to better immerse in the scenario before answering a number of subsequent questions. Of main interest to our hypotheses, however, was the interpersonal distance between both figures. Thereby we assume that a larger interpersonal distance reflects less affiliative behavior and thus a less pleasant interaction (cf. Mehrabian, 1972; Snyder & Endelman, 1979; Williams & Bargh, 2008).

Concretely, with a mouse click participants indicated the exact position of their avatar. Horizontal and vertical grid lines appeared on the screen when participants clicked on a certain coordinate in the drawing to help them specify their exact position. Participants could click as often as they wanted until they were satisfied. The computer recorded the distance (in pixels; 28 pixels = approximately 10 mm) between the female interaction partner and the final location of participants' avatar. Larger scores indicate a larger distance between both figures.

After the drawing task, participants answered a number of additional questions about the scenario. First, they expressed their expectations about the pleasantness of the interaction described in the scenario. While until then no reference had been made to a mating context (the scenario merely involved a very basic interaction between individuals of both sexes), we then asked participants to consider whether they expected 1) having to spend much money on presents to attract the depicted woman, and 2) having to spend much time on romantic activities to attract her. In addition, we asked participants to rate how easily they believed they could attract the female interaction partner ("*I think my chances to attract the women in the scenario are high"* and *"I think it would cost a lot of effort to seduce the woman in the scenario" (*reverse-coded). Both items were averaged (α = .70) to form an index of participants' expectations about the effectiveness of their mating efforts. Higher scores indicated higher expected effectiveness. All statements were judged on seven-point scales anchored with *totally disagree* and *totally agree*.

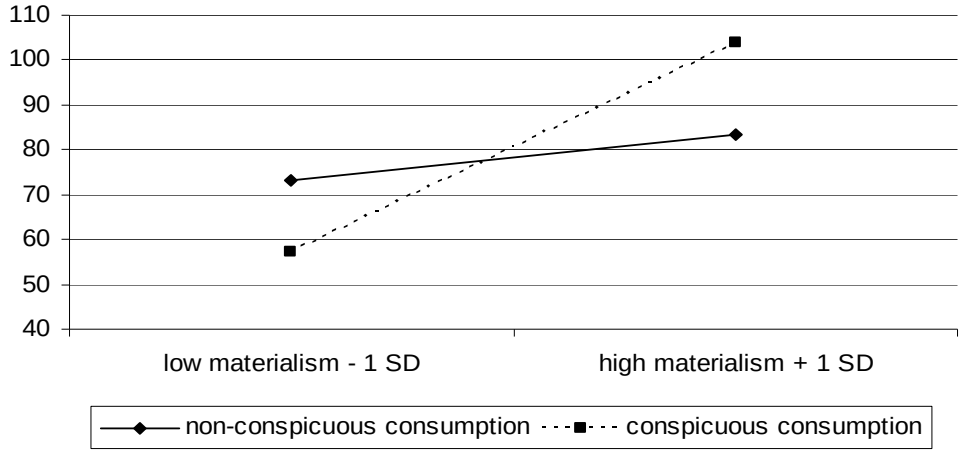
After a number of filler tasks participants completed the Material Values Scale (Richins & Dawson, 1992). Scale items were averaged (α = .86) to form an index of participants' level of materialism.

Results

Interaction related variables. A GLM analysis with Materialism and Consumption Condition as between-subjects factors revealed no significant main effect of Consumption Condition, $F(1, 67) = .38$, $p = .54$, but a significant main effect of Materialism, $F(1, 67) = 12.12$, $p = .0009$, on the distance scores. Overall, interpersonal distance increased with increasing materialism. However, this main effect was qualified by a significant interaction effect between Materialism and Consumption Condition, $F(1, 67) = 5.22$, $p = .03$ (figure 4).

The regression slope was significant in the conspicuous consumption condition, $t(67) = 3.98$, $p = .0002$, but not in the non-conspicuous consumption condition, $t(67) = .87$, $p = .39$. In addition, spotlight analysis (Aiken & West, 1991) revealed that interpersonal distance scores differed significantly between both conditions for participants scoring high (1 SD above the mean) on materialism, $t(67) = -2.00$, $p = .05$, but not significantly for participants scoring low (1 SD below the mean) on materialism, $t(67) = 1.39$, $p = .17$. In other words, participants with high levels of materialism tended to locate their avatar further away from the female interaction partner when she engaged in conspicuous consumption behavior, compared to when she did not.

Figure 4. Interpersonal distance (in pixels)



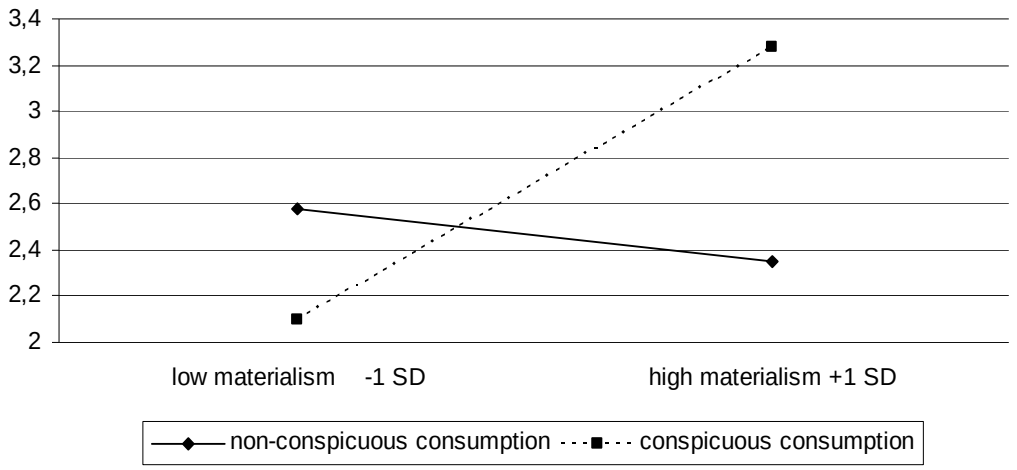
While these interpersonal distance scores are assumed to reflect participants' feelings about the pleasantness of the interaction, we also assessed this more explicitly. Although the data pattern for participants' explicit evaluation of the interaction was consistent with the pattern found for the distance scores, the interaction effect was not significant, $F(1, 67) = 1.40$, $p = .24$. However, a significant negative correlation between the distance scores and participants' evaluation of the interaction, $r = -.32$, $p = .006$, confirmed that, as intended, our distance measure captured participants' feelings about the interaction described in the scenario. The further away participants located their avatar from the depicted woman, the less pleasant they expected the interaction to be.

Expected effort in terms of money vs. time. With respect to the amount of money participants expected having to spend on presents to attract the depicted woman, we found no significant main effects of Consumption Condition, $F(1, 67) = 1.45$, $p = .23$, or Materialism, $F(1, 67) = 2.20$, $p = .14$. More importantly, however, the interaction between Materialism and Consumption Condition was significant, $F(1, 67) = 4.54$, $p = .04$ (figure 5).

The regression slope was significant in the conspicuous consumption condition, $t(67) = 2.50$, $p = .02$, but not significant in the non-conspicuous consumption condition, $t(67) = -.47$, $p = .64$. Spotlight analysis (Aiken & West, 1991) confirmed that male participants scoring high on materialism (1 SD above the mean) expected having to spend more money to attract the depicted woman in the conspicuous consumption condition than in the non-conspicuous consumption condition, $t(67) = -2.32$, $p = .02$. For men scoring low (1 SD below the mean) on materialism, no difference was found across conditions, $t(67) = .89$, $p = .38$.

In contrast to the effects for money, no significant effects were found of Consumption Condition, Materialism, or the interaction between both on the expected time spent on romantic activities, all Fs < 1.88, all ps > .17.

Figure 5. Expected effort in terms of money



Expected effectiveness of mating efforts. While both the expected effort in terms of money, r = -.61, p < .0001, as well as in time, r = -.53, p < .0001, were significantly negatively correlated with participants' expectations about the effectiveness of their mating efforts, a GLM analysis revealed a pattern of results for the latter variable that was consistent with the result for participants' expected monetary effort. We found no significant main effects of Consumption Condition, $F(1, 67) = 1.54$, $p = .22$, or Materialism, $F(1, 67) = .73$, $p = .40$. However, the interaction between Materialism and Consumption Condition was significant, $F(1, 67) = 5.41$, $p = .02$.

Male participants scoring high (1 SD above the mean) on materialism thought their mating efforts would be less effective in the conspicuous consumption condition compared to the non-conspicuous consumption condition (respectively M = 3.61 vs. M = 4.55), $t(67) = 2.20$, $p = .03$. No difference was found across conditions ($M_{conspicuous}$ = 4.54 vs. $M_{non\text{-}conspicuous}$ = 4.11) for participants scoring low on materialism (1 SD below the mean), $t(67) = -1.07$, $p = .29$. In addition, the regression slope was significant in the conspicuous consumption condition, $t(67) = -2.48$, $p = .02$, but not significant in the non-conspicuous consumption condition, $t(67) = 1.02$, $p = .31$.

Mediation analyses. Finally, we tested whether participants' interpersonal distance scores were driven by their expectations about the effectiveness of their mating efforts. Indeed, when adding this variable to the original moderation model, the direct path from Consumption Condition X Materialism to distance was no longer significant, $F(1, 66) = 2.36$, $p = .13$, while the effect of expected effectiveness on the distance scores was significant, $F(1, 66) = 8.02$, $p = .006$. Therefore we tested the Consumption Condition X

Materialism → expected effectiveness → interpersonal distance mediated moderation (Morgan-Lopez & MacKinnon, 2006). The indirect path was significant (two-tailed z = -1.98, p = .048), which suggests that feelings of expected mating effort effectiveness (due to women's conspicuous consumption) may have influenced participants' distance scores in the preceding drawing task.

Discussion

While the previous studies demonstrated that materialistic men tend to believe that it requires more money to attract a woman who conspicuously flaunts status products, study 2 provided preliminary evidence that women's conspicuous consumption may also affect materialistic men's behavior in interaction situations. Specifically, the results of study 2 indicated that materialistic men may increase the interpersonal distance between themselves and a female interaction partner who engages in conspicuous consumption, due to a diminished confidence in the effectiveness of their mating efforts.

The aim of study 3 is threefold. First, a shortcoming of studies 1 and 2 pertains to their hypothetical nature. If our predictions are correct, we should also find that a real interaction between a male participant and a woman who engages in conspicuous consumption behavior is affected by the man's level of materialism. Hence, in study 3 we will test our predictions by setting up real interactions between male participants and a female interaction partner who either carries branded status products or not.

Second, while study 2 merely involved a measure of interpersonal distance, study 3 will take into account a wider range of behaviors which may all signal affiliation. Third, in contrast with the previous studies we will also set up same-sex interactions involving only women. If we find the predicted effects for men, but not or to a lesser extent for women, this further corroborates our prediction that these effects are not merely the result of the level of materialism of the participant (irrespective of his/her sex).

Study 3

Method

Participants. One-hundred thirty-two students (77 males, 55 females) varying in age from 17 to 24 years (M_{age} = 19.22, SD = 1.32) participated in the experiment in return for partial course credit. Every fifteen minutes one participant entered the lab. Each participant engaged in an interaction of approximately 2 to 3 minutes with a female interaction partner (confederate). The interaction was disguised as a taste test. After the interaction, participants were accompanied to an adjacent room where

they we seated in partially enclosed cubicles to fulfill a number of additional tasks, most of which unrelated to the present study.

Introduction. Upon arrival at the lab, the experiment leader provided a brief description of the experiment to each participant. The participant was informed that s/he was about to participate in a taste test for a new brand of fruit juice that had just been introduced in the market. They were told that an independent market researcher would conduct the taste test, and that the experiment leader would lead them to an adjacent computer room to complete their experimental session after the taste test.

Room. The interaction took place in a small compartment of the lab, which was separated from the adjacent computer room. Participants were lead in the room by the experiment leader. The room contained one chair in the middle, facing the wall opposite the entrance door, and a white couch in which the participant was instructed to have a seat. The couch allowed participants to move their legs, arms and body freely while interacting. The female confederate, who had been introduced as a market researcher, was seated on the chair when the participant entered the lab. A small table was placed in between the chair and the couch. A cup with juice and a number of attributes related to the experimental manipulation were placed on the table before the participant entered the lab.

Manipulation. While participants believed that we were interested in their responses to the taste test, our true concern were participants' self-reported and non-verbal reactions toward the female confederate who conducted the taste test, and who either carried a number of unbranded, non-status products (*non-conspicuous consumption condition*) or a number of status products (*conspicuous consumption condition*).

Specifically, in the conspicuous consumption condition a shiny Guess handbag, a Sony Ericsson Xperia Smartphone, and a bunch of keys including a Porsche ignition key were strategically placed on and next to the table between the participant and the female confederate, close to the confederate such that the products seemed to belong to her. In the non-conspicuous consumption condition, these products were replaced by an unbranded handbag of the same color, a regular Sony Ericsson mobile phone, and the same bunch of keys including a car key of a middle class car. In addition, in the conspicuous consumption condition the confederate wore a rather expensive-looking suit jacket and a Swarovski necklace. In the non-conspicuous consumption condition, the suit jacket was replaced by a more casual jacket and the necklace was removed (cf. appendix 3 for pictures of the experimental set-up).

Taste test. Once participants were seated, they were asked to taste from the cup that was placed on the table in front of them. The cup contained 100 ml of fruit juice (apple and cherry flavor). Participants were allowed to drink as much of the juice as they wanted during the course of the taste test. After tasting the juice, the confederate asked a number of standardized questions about the quality of the juice and participants' experience with other types of juices. At the end of the interaction, the female confederate asked each participant to evaluate the juice on a ten-point scale anchored with *very bad* and *very good*.

Female confederate. The confederate was a 22 year-old woman (only a few years older than most participants). She had the same hairdo (loose hanging long hair) in each condition and she wore a skirt of the same length and the same top in both conditions to avoid that differences in the amount of visible skin would render her more attractive to male participants in one condition compared to the other.

The confederate received one hour of training in the lab on the day before the experiment such that she was familiar with the question format and the exact set-up of the interaction. She was instructed to be (equally) friendly to each participant–irrespective of his/her reactions or friendliness–and to behave in a standard way during each interaction. More specifically, she always crossed her legs and she held a large folder containing the questionnaire in her hands to avoid random hand movements during the interaction.

Measures. After the interaction, participants were lead into a different room where they filled out a number of additional questionnaires. Immediately after the interaction participants were asked to express their feelings about the interaction. On a seven-point scale anchored with *totally disagree* and *totally agree*, they judged the statements "I had the impression that the market researcher liked to interact with me" and "I enjoyed the interaction". Both items were averaged ($\alpha = .72$) to form an index of participants' evaluation of the interaction. To keep up the cover story, we told participants that this evaluation was important for statistical purposes, because prior research had shown that individuals are likely to take into account their experience of the interaction when making evaluations of products in face-to-face interviews. After a number of tasks, which were unrelated to the present study (approximately 30 minutes after the interaction), we assessed participants' level of materialism with the Material Values Scale (Richins & Dawson, 1992). Scale items were averaged ($\alpha = .82$) to form an index of materialism.

Prior research involving interactions between participants and a confederate not only required participants to evaluate the interaction, but also the confederate (cf. Andersen, Guerrero, Buller, & Jorgensen, 1998). Consistently, we instructed the confederate to also evaluate each interaction on a number of dimensions. She did this after each interaction, before the next participant entered the lab.

Specifically, the confederate rated a number of non-verbal behaviors of the participant which are assumed to communicate *immediacy* (i.e., warm, affiliative behaviors; Andersen, Andersen, & Jensen, 1979.

In particular, on a seven-point scale anchored with *totally disagree* and *totally agree*, the confederate judged the extent to which the participant made eye-contact, had a relaxed posture, directed his/her body towards her, smiled at her, and seemed not distant. Internal consistency was high ($\alpha = .93$) such that the items were averaged to form an index of the confederate's evaluation of each participant's affiliative behavior. The high correlation between these items is probably due to the fact that an individual forms a holistic view of the behavior of his/her interaction partner, rather than being able to carefully dissect individual behaviors (Dunberg & Burgoon, 2005). Although the female confederate was aware of the conditions, she was unaware of the specific hypotheses of our study as well as of participants' level of materialism.

Finally, we rated the friendliness of the confederate (on a seven-point scale anchored with *very unfriendly* and *very friendly*), based on audio recordings of each of the interactions (to disguise the condition). Although the confederate was instructed to behave in a standard way, it is important to not ignore the possibility that she unintentionally or unknowingly may have been more or less friendly in different conditions. For instance, due to the fact that she was heterosexual she might have behaved more friendly to male participants, or the difference in attire in both Consumption Conditions may unwillingly have affected her interaction style. Indeed, although the confederate was generally rated to be very friendly, we did find significant main effects of Consumption Condition $F(1, 128) = 8.06$, $p = .005$, and participants' Sex, $F(1, 128) = 7.51$, $p = .007$ on friendliness scores. Specifically, the female confederate was friendlier to male participants, and she was friendlier in the non-conspicuous consumption condition. The interaction between both was not significant (p=.85).

Results

We predicted an effect of Consumption Condition (non-conspicuous consumption vs. conspicuous consumption condition) on participants' evaluation of the interaction as well as on the confederate's evaluation. However, we expect to find this effect for men, not or to a lesser extent for women. In addition, we expect that this interaction between Consumption Condition and Sex will be qualified by an interaction with Materialism such that the predicted effects hold for materialistic men, not for men scoring low on materialism. To test these predictions, we conducted a three-way GLM analysis with Materialism, Sex, and Consumption Condition as between-subjects factors on the evaluation of the interaction by the participants as well as by the female confederate.

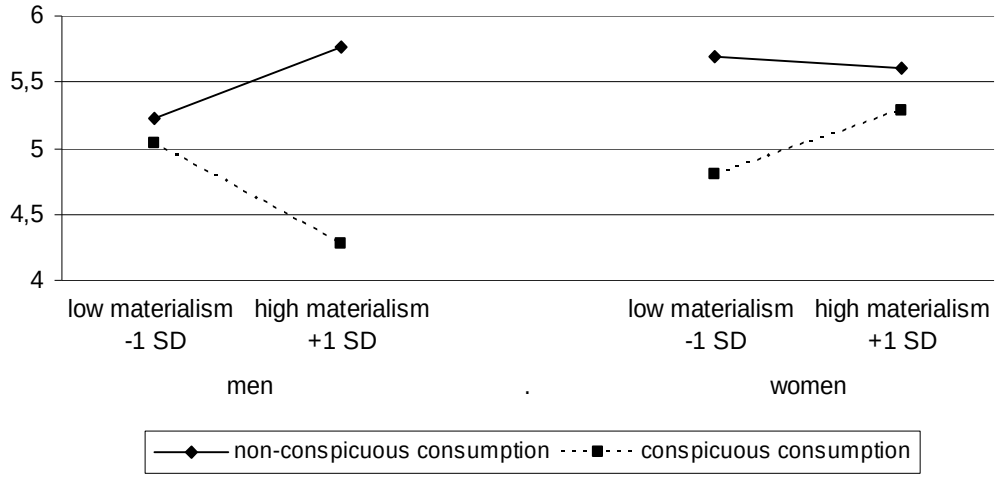
Consistent with our predictions, we found the predicted three-way interaction effects of Materialism, Sex and Consumption Condition on participants' evaluation of the interaction, $F(1, 124) = 4.20$, $p = .04$, and on the evaluation of the interaction by the female interaction partner, $F(1, 124) = 4.50$, $p = .04$. In addition, participants' evaluations of the interaction were significantly correlated with the evaluation of the confederate, $r = .38$, $p < .0001$.

Participants' evaluation of the interaction. For men, we found a significant effect of Consumption Condition on the evaluation of the interaction, $F(1, 73) = 11.40$, $p = .001$. Men in the non-conspicuous consumption condition tended to evaluate the interaction more positively than men in the conspicuous consumption condition. However, this main effect was driven by a significant interaction with Materialism, $F(1, 73) = 8.01$, $p = .006$ (figure 6).

The regression slope was significant in the conspicuous consumption condition, $t(73) = -2.47$, $p = .01$, but not in the non-conspicuous consumption condition, $t(73) = 1.58$, $p = .12$. More importantly, spotlight analysis (Aiken & West, 1991) revealed that male participants scoring high (1 SD above mean) on materialism tended to evaluate the interaction less positively when the confederate was surrounded with status products, compared to when she was not, $t(73) = 4.63$, $p < .0001$. For male participants scoring low (1 SD below the mean) on materialism no difference was found between both Consumption Conditions, $t(73) = .56$, $p = .58$. Controlling for the objective friendliness of the confederate did not alter these results. In fact, the main effect of friendliness as a covariate was not significant, $F(1, 72) = .17$, $p = .68$, suggesting that male participants' evaluation of the interaction could not be explained by differences in the objective friendliness of the confederate.

For women, a marginally significant main effect of Consumption Condition, $F(1, 51) = 3.77$, $p = .06$, learns that female participants liked the interaction slightly less when the confederate engaged in conspicuous consumption behavior. The main effect of Materialism nor the interaction between Materialism and Consumption Condition were significant (both Fs < .66, all ps > .42) (figure 6). The significant main effect of Consumption Condition disappeared, $F(1, 50) = 1.47$, $p = .23$, when we controlled for the objective friendliness of the confederate. The effect of the covariate was significant, $F(1, 50) = 7.06$, $p = .01$.

Figure 6. Male and female participants' evaluation of the interaction

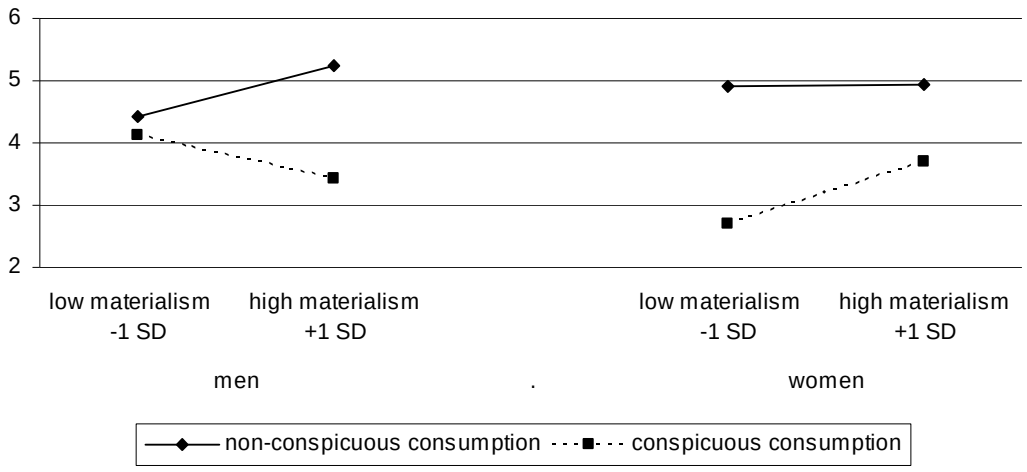


These findings confirm our hypothesis that women's conspicuous consumption behavior may especially affect materialistic men's evaluation of an interaction. The question arises then whether these negative feelings also appeared from their non-verbal behavior, as judged by the female confederate.

Confederate's evaluation of the interaction. With respect to the evaluation of the interaction by the confederate, we found a significant effect of Consumption Condition for male participants, $F(1, 73) = 8.15$, $p = .006$. Men in the non-conspicuous consumption condition tended to display more affiliative behaviors than men in the conspicuous consumption condition. However, this main effect was entirely driven by a significant interaction with Materialism, $F(1, 73) = 5.21$, $p = .03$. Although the regression slopes were not significant in both Consumption Conditions, ($t_{conspicuous}(73) = -1.57$, $p = .12$; $t_{non\text{-}conspicuous}(73) = 1.65$, $p = .10$), the non-verbal behavior of male participants scoring high (1 SD above the mean) on materialism tended to be evaluated less positively by the confederate when she engaged in conspicuous consumption behavior compared to when she did not, $t(73) = 3.82$, $p = .0003$. For male participants scoring low (1 SD below the mean) on materialism no difference was found between both Consumption Conditions, $t(73) = .54$, $p = .59$. Again, controlling for the confederate's friendliness did not alter these results.

For female participants, the main effect of Consumption Condition on the evaluation of the interaction by the female interaction partner was significant, $F(1, 51) = 24.38$, $p < .0001$. No other effects were significant (both Fs < 1.35, both ps > .25) (figure 7). Female participants displayed less affiliative behavior in the conspicuous consumption condition than in the non-conspicuous consumption condition. However, these scores were again strongly influenced by the friendliness of the confederate, $F(1, 50) = 17.00$, $p = .0001$.

Figure 7. Male and female participants' non-verbal behavior during the interaction (evaluated by the female confederate)

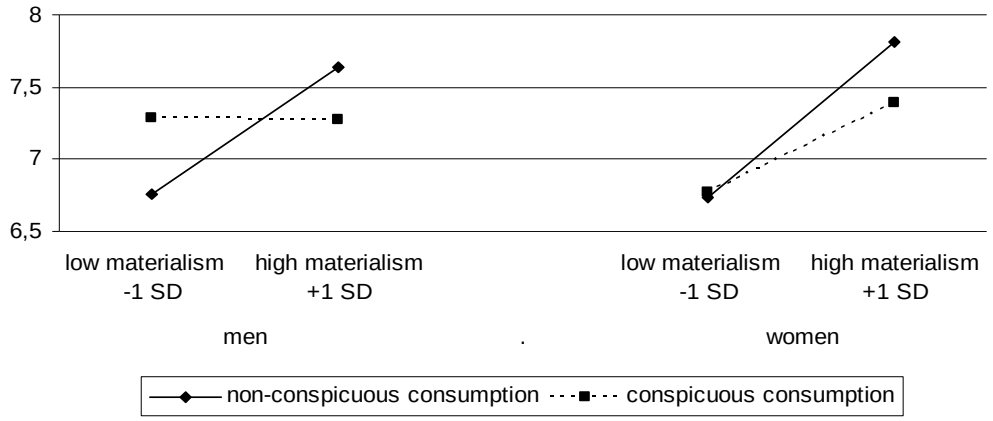


Evaluation of the juice. Finally, one may wonder whether participants' evaluation of the interaction also had consequences for the outcome of the taste test itself. At the end of the interaction, the confederate asked participants to evaluate the juice. Possibly, materialistic men's negative evaluation of the interaction might have spilled over to their judgment of the drink. A three-way GLM with Materialism, Sex, and Consumption Condition as between-subjects factors on the evaluation of the fruit juice only yielded a significant main effect of Materialism, $F(1, 124) = 9.57$, $p = .002$ (all other Fs < 2.64, all ps > .10). Overall, materialistic participants reported to like the juice better[3].

Nonetheless, conducting separate analyses for men and women yielded interesting results. For male participants, we found a significant main effect of Materialism, $F(1, 73) = 4.05$, $p = .047$, on their evaluation of the juice. However, this main effect was qualified by a significant interaction with Consumption Condition, $F(1, 73) = 4.39$, $p = .04$. The regression slope was significant in the non-conspicuous consumption condition, $t(73) = 2.76$, $p = .007$, but not in the conspicuous consumption condition, $t(73) = -.06$, $p = .95$ (figure 8).

[3] *In addition to the evaluation of the juice we also measured the quantity of juice participants drank during the taste test. A three-way GLM only revealed a significant main effect of Materialism, F(1, 124) = 3.82, p = .05. Consistent with the fact that they liked the juice more, materialistic participants drank more. No other variables influenced the amount participants drank.*

Figure 8. Male and female participants' evaluation of the juice during the taste test



So, while male participants reported to like the juice more when they were more materialistic in the non-conspicuous consumption condition, which is consistent with the overall positive effect of materialism on the evaluation of the juice, this positive effect of materialism was absent in the conspicuous consumption condition. This could suggest that (negative) feelings about the interaction might have influenced materialistic men's evaluation of the juice in the conspicuous consumption condition.

Indeed, the direct path from Consumption Condition X Materialism to the evaluation of the juice became non-significant when adding participants' evaluation of the interaction (p = .34) to the original moderation model. Participants' evaluation of the interaction was significantly positively related to their evaluation of the juice in the taste test, $F(1, 72) = 14.43$, p = .0003. Consequently, we tested the Consumption Condition X Materialism → evaluation of interaction → evaluation of juice mediated moderation (Morgan-Lopez & MacKinnon, 2006). The indirect path through participants' evaluation of the interaction was significant (two-tailed z = 2.28, p = .02), supporting the proposed role of participants' evaluation of the interaction as a mediator.

In contrast to men, finally, we only replicated the significant main effect of Materialism on female participants' evaluation of the juice, F (1, 51) = 5.39, p = .02. The main effect of Consumption Condition and the interaction between Materialism and Consumption Condition were not significant (Fs < .38, ps > .54).

Discussion

While studies 1 and 2 suggested that women's conspicuous consumption might produce the strongest effects in opposite sex interactions involving materialistic men, both studies did not involve real interactions. Study 3 aimed to address this limitation.

In line with our hypotheses and consistent with study 2, materialistic men evaluated the interaction less positively when the female confederate carried status products than when she did not. Consistently, the confederate rated the non-verbal behavior of these participants as being less warm and friendly.

In addition, the data suggest that the less favorable reactions of materialistic men to the interaction with a woman who engaged in conspicuous consumption behavior even had consequences for their evaluation of the juice. While the taste of the juice was clearly unrelated to the person who conducted the taste test and certainly to the products this person happened to be surrounded with at the time of the experiment, the data suggest that materialistic men's negative evaluation of the interaction in the conspicuous consumption condition spilled over to their evaluation of the juice. However, the outcome of the taste test was also influenced by processes related to conspicuous consumption and materialism which were not immediately related to the influence of these factors on participants' evaluation of the interaction situation. For instance, men scoring low on materialism tended to like the juice more when the confederate was surrounded with status products compared to when she was not. It is not immediately clear why this was the case or why these results were not replicated for female participants. Although it lies beyond the scope of this paper to further explore this effect, future research might do so.

Finally, for female participants we found an overall negative effect of the confederate's conspicuous consumption on the quality of the interaction. However, at least in part, this effect seemed to be due to an unwanted by-product of our manipulation, namely to the fact that the female confederate was less friendly in the conspicuous consumption condition, compared to the non-conspicuous consumption condition. While this was also the case for male participants, their evaluation of the interaction was not correlated with the objective friendliness of the confederate, and friendliness scores could not explain differences between more and less materialistic men across conditions. This result supports our prediction that women's conspicuous consumption behavior in itself mainly affects men. Still, future research would benefit greatly from a cleaner manipulation than the one used in this study.

General discussion

While the topic of conspicuous consumption has received considerable research attention, surprisingly little is known about how this pattern of consumption is perceived or how others react to it. This is especially the case for reactions to *women* engaging in conspicuous consumption behavior. Insights from the field of evolutionary psychology yielded a number of arguments why in particular *men* would pay attention to or be influenced by women's status consumption. Hence, this essay aimed to examine the interplay between men's reliance on conspicuous consumption as a mating strategy (e.g., Griskevicius et

al., 2007; Janssens et al., 2010; Sundie et al., 2011) and women's engagement in status-signaling consumption.

In addition, we assessed the moderating role of materialism. It is often assumed that a material value orientation produces negative outcomes for the development of social relationships (e.g., Richins & Dawson, 1992; Solberg, Diener, & Robinson, 2004), yet little prior research studied the impact of materialism on the behaviors displayed in concrete social interactions. Given materialists' strong concern with luxury consumption and status, we proposed that materialistic men (rather than men scoring low on materialism) would react strongest to women's conspicuous consumption behavior.

Consistent with our expectations, studies 1 and 2 showed that women's conspicuous consumption may, indeed, be differentially interpreted depending on the level of materialism of the male perceiver. Both studies found that materialistic men tended to interpret women's conspicuous consumption as a signal of elevated financial standards for prospective mates. Men scoring low on materialism were less likely to interpret women's conspicuous consumption as a meaningful indicator of mate requirements. In addition, the results of study 2 indicated that women's conspicuous consumption may render materialistic men less confident about the effectiveness of their mating strategy. This, in turn, may influence these men's behavior in an interaction situation. For instance, in study 2 materialistic participants kept more interpersonal distance between a hypothetical female interaction partner and their own virtual representation when the female interaction partner engaged in conspicuous consumption behavior compared to when she did not.

The assumption that women's conspicuous consumption may negatively influence the course of social interactions was further supported by study 3, which involved real-life interactions. Both parties involved in the interaction (male participants as well as a female confederate) evaluated the interaction as being less pleasant and friendly when the female confederate was surrounded by status products (compared to when she was not) and when the male participant scored high on materialism. Also female participants seemed to respond to the confederate's conspicuous consumption. However, the effects reported for female participants seemed to be largely attributable to differences in the confederate's friendliness across conditions, rather than to differences in conspicuous consumption per se. This confound stresses the importance of future research involving cleaner manipulations of women's conspicuous consumption behavior.

Note that, in none of the studies involving interactions (studies 2 and 3) we created an overt mating context. Likewise, most real-life interactions between men and women do not have an overt sexual purpose. As such, our results seem to support the proposition that evolutionary rooted mating mechanisms may play an important role in shaping social relations and interactions even at very early stages of interpersonal perception (Maner, DeWall, & Gaillot, 2008; Maner, Gailliot, & DeWall, 2007). Prior research

in this context found, for instance, that pictures of attractive women and high-status men were better able to draw the attention of observers compared to pictures of dominant women or attractive men (Maner, DeWall, & Gaillot, 2008), consistent with the finding that both sexes have evolved preferences for different characteristics in opposite-sex mating partners (e.g., Buss, 1989; Buss & Schmitt, 1993; Trivers, 1972). Interestingly, like in our studies, none of these studies involved a procedure to explicitly activate mating goals. A drawback of this set-up, however, is that it leaves some room for alternative explanations. For instance, women's conspicuous consumption behavior may render materialistic men less confident *in general*. Hence, future research is warranted to fully understand the impact of women's status-signaling consumption on (materialistic) men.

Also a number of other questions may deserve further testing. For instance, studies 1 and 2 suggest that women's conspicuous consumption may be interpreted by materialistic men as an indicator of the level of resources she requires from a partner. To the extent that conspicuous consumption is a valid indicator of wealth (cf. Veblen, 1899/1994) and that wealthier women require more wealth from prospective mating partners (Buss, 1989), our findings could thus suggest that materialistic men are better attuned to interpreting signals communicated by (women's) material consumption. However, such a conclusion assumes that women consume status products to–consciously or unconsciously–communicate a message to men. Indeed, it is likely that women strategically engage in conspicuous consumption behavior to discourage men of lower mate value. However, our findings do not provide insight in the motivations driving women's conspicuous consumption. Future research might investigate these motivations in more depth.

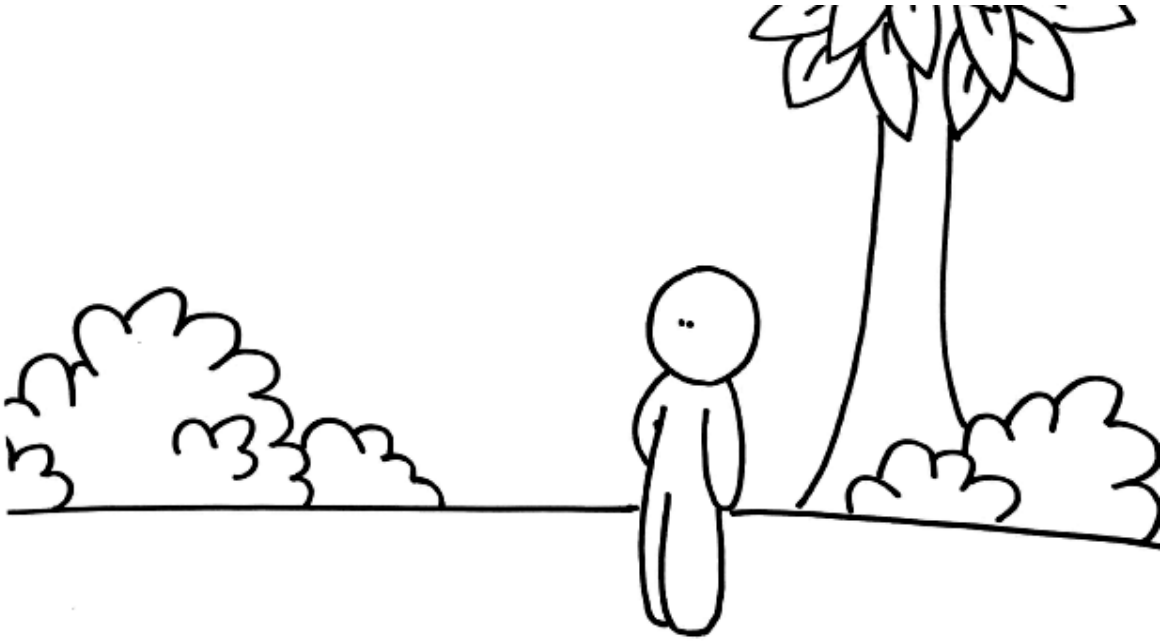
In addition, future research may investigate the consequences of these findings for sales management. For instance, based on our data one could assume that it constitutes a risk for the sales of a product when saleswomen wear expensive-looking, branded clothes or ostentatious jewelry. Indeed, our findings showed that a negatively experienced social interaction due to a female interaction partner (e.g., a saleswoman) flaunting status products, may negatively impact materialistic men's evaluation of a product. Future research may explore, for instance, under which circumstances this effect occurs or whether some products are more or less susceptible to this effect.

Finally, the studies presented in this essay focused on women's conspicuous consumption and its implications for interactions with men. This does not necessarily mean, though, that interactions involving other types of dyads may not be affected by the conspicuous consumption behavior of the interaction partners involved. One could, for instance, expect that an interaction between men would be equally strongly, or perhaps even more strongly, influenced by the level of conspicuous consumption of the interaction partners.

Like with women's conspicuous consumption, potential competitors' status-signaling consumption could also affect men's assessment of their relative mate value. Possibly, however, this assessment will have different implications for the non-verbal behavior of the interactions partners. While the current studies focused on behaviors indicating warmth, friendliness, and affiliation, which may be considered as feminine rather than masculine (Eagly & Mladinic, 1989; Helmreich, Spence, & Wilhelm, 1981), behaviors may also be characterized by a vertical dimension related to power, control, and status (Hall, Coats, & Smith LeBeau, 2005; Keltner, Gruenfeld & Anderson, 2003). These behaviors are particularly beneficial when being displayed by men in a competitive context. After all, women tend to favor men who display characteristics related to status or social dominance (for an overview, see e.g., Buss, 2004). So, conspicuous consumption of male interaction partners may increase men's display of behaviors related to status or social dominance.

Taken together, the results presented in this essay suggest that women's conspicuous consumption behavior may produce outcomes, especially when being perceived by men, which stretch beyond a mere signaling of status. Interestingly, women's conspicuous consumption may be perceived differently and reacted upon more negatively depending on the level of materialism of the male perceiver. Future research may explore in which other ways a material value orientation affects social interactions and interpersonal perception.

Appendix 2. **Drawing task study 2**



Appendix 3. **Manipulation and experimental set-up study 3**

Non-conspicuous consumption condition



Conspicuous consumption condition



ESSAY 3A:

WOULD MALE CONSPICUOUS CONSUMPTION CAPTURE THE FEMALE EYE? MENSTRUAL CYCLE EFFECTS ON WOMEN'S ATTENTION TO STATUS PRODUCTS

Abstract

In line with evolutionary principles of reproduction and mate selection, the current research shows that women's attention to status cues fluctuates across their menstrual cycle. Specifically, we show that women pay more attention to status products in a visual display around ovulation than in other phases of their menstrual cycle. Pill use eliminates these cycle phase effects. The results are discussed in relation to research on female mating goals (mate selection versus mate attraction) and conspicuous consumption.

Essay adapted from: Lens, I., Driesmans, K., Pandelaere, M., & Janssens, K. (2012). Would male conspicuous consumption capture the female eye? Menstrual cycle effects on women's attention to status products. Journal of Experimental Social Psychology, 48 (1), 346-349.

Introduction

Prior research investigated why individuals engage in the conspicuous consumption of status products (e.g., Rucker & Galinsky, 2009; Sivanathan & Pettit, 2010). However, little research explicitly examined when status products draw people's attention. This paper approaches this issue from an evolutionary psychological perspective. Research within this paradigm has documented that women favor men with status and, correspondingly, that men signal their mate value through conspicuous consumption. We investigate whether and when women pay attention to such signals of status.

Our research contributes to the literature in two ways. First, while previous studies focus on women's self-reported *interest* in high-status men, we focus on their spontaneous *attention* to status signals. Second, we examine the effectiveness of (men's) conspicuous consumption by investigating how women's attention to status products shifts across the menstrual cycle. How mate selection motives, activated around ovulation, may influence women's relation with specific products has not been studied before.

Theoretical background

Sex differences in parental investment have led to differences in partner preferences (Bjorklund & Shackelford, 1999; Trivers, 1972). While men prefer youthful and attractive women (Buss, 1989; Buss & Schmitt, 1993; Kenrick & Keefe, 1992; Singh, 1993), women favor mates who exude genetic fitness and who are able to invest (economic) resources in their offspring (Bjorklund & Shackelford, 1999; Buss, 1989; Hill & Buss, 2008). Consequently, women are attracted to men with status (Colarelli & Dettmann, 2003; Kenrick, Sadalla, Groth, & Trost, 1990). In response to this, men in a mating mindset attach more importance to their status (Roney, 2003; Saad & Vongas, 2009) and show an increased interest in status-signaling products (Baumeister & Vohs, 2004; Griskevicius et al., 2007; Janssens et al., 2011).

Various studies have shown that women's mating motivations increase around ovulation, which is the most fertile period in their menstrual cycle (Gangestad, Garver-Apgar, Simpson, & Cousins, 2007). Ovulation may activate two goals: a mate selection and a mate attraction goal. The *mate attraction goal* involves displaying one's qualities to attract a mate. Because men prefer partners who are physically attractive (Buss, 1989), ovulating women attempt to dress more attractively (Haselton et al., 2007). More specifically, ovulating women are willing to pay more for products that enhance their appearance (Hill & Durante, 2009) and they show an increased intention to purchase sexy clothing (Durante et al., 2011). The *mate selection goal* involves screening potential mates for desired qualities. For instance, ovulating women

are attracted to more masculine, taller, and more socially dominant men than women in other phases of their menstrual cycle (Gangestad, Thornhill, & Garver-Apgar, 2005; Lukaszewski & Roney, 2009). As men may attempt to signal their mate qualities through their possessions, ovulating women may also be particularly interested in men who engage in conspicuous consumption behavior.

However, women's interest in high-status men may not necessarily translate to an increased sensitivity to male conspicuous consumption around ovulation because conspicuous consumption may not be a *trustworthy* signal of status. After all, men with access to credit may improve their capacity to purchase status products, for instance by running up debt, while their reproductive qualities remain unchanged (Colarelli & Dettmann, 2003; Gallup & Frederick, 2010). In fact, conspicuous consumption may even signal the opposite of status as people are more interested in status products when their self-esteem is threatened (Sivanathan & Pettit, 2010) or when they feel powerless (Rucker & Galinsky, 2008, 2009).

Although women would be better off focusing on less ambiguous signals of male mate value, conspicuous consumption may nevertheless draw their attention. First, conspicuous consumption may have become a less trustworthy signal of status only in our recent past. In fact, when Veblen (1899) coined the term conspicuous consumption, he mainly described the consumption pattern of the rich in a time when luxury was unattainable for the masses (Silverstein & Fiske, 2003). Second, women may spontaneously pay attention to any signal of status. Making inferences about its trustworthiness may require more deliberative processing.

In sum, while women may be interested in high-status men, it does not necessarily follow that they would also be interested in men who engage in conspicuous consumption. Still, if women's preference for status results from evolutionary selection mechanisms, one could expect women to be *spontaneously* interested in any signal that may identify high-status men, especially around ovulation. This heightened interest could in fact be so fundamental that it affects women's orientation of *attention* (see also Anderson et al., 2010) towards signals of status, even in the absence of men. Consequently, we predict that ovulating women more readily perceive status products in their environment than women in other phases of their menstrual cycle.

This predicted effect of ovulation is assumed to be driven by hormonal shifts across the menstrual cycle. A host of studies found evidence that fluctuations in the levels of estrogen and progesterone influence women's mating motivations and mate preferences (e.g., Garver-Apgar, Gangestad, & Thornhill, 2008; Lukaszewski & Roney, 2009). For this reason, we do not expect to find effects of menstrual cycle phase on attention to status products for women using hormonal contraceptives, such as the pill. Indeed, pill usage suppresses the regular flow of hormones and, as a result, eliminates cycle effects on mate preferences, attractiveness to men, and search effort for mating partners (Miller, 2010). Although this does

not allow us to make predictions about pill users' average level of attention to status products, it does imply that their attention will not vary across cycle phases. In sum, we hypothesize the following:

> ***H1.*** *Female attention to status products is higher around ovulation (fertile phase of menstrual cycle) than before (menstrual phase) and after (luteal phase) ovulation.*
> ***H2.*** *Pill use moderates the effect of cycle phase on attention to status products, such that the effect of cycle phase will only be found in normally cycling women, not in pill users.*

We compare ovulating women with women in the phases before and after ovulation, instead of comparing fertile with non-fertile women, to account for possible differences in attention between women in the menstrual and the luteal phase, for instance due to physical discomfort during menstruation (cf. Miller, Tybur, & Jordan, 2007). In addition, the use of three cycle phases has the advantage of ruling out alternative explanations in terms of mood. Changes in mood particularly occur right before menstruation (e.g., Premenstrual Syndrome; Steiner, Dunn, & Born, 2003). A mood-based explanation would thus predict differences between the menstrual and the luteal phase; this is not the pattern we predict. Hence, if we observe increased levels of attention in the fertile phase compared to both other phases, our findings are unlikely to be driven by mood.

Study 1

To investigate whether ovulation diverts attention to products that convey status, we exposed pill using and normally cycling participants to a visual attention task. Hence, we focus on women's attention to status products, not on their appreciation of males associated with these products.

Method

One hundred and sixty-two female students (M_{age} = 22.34, *SD* = 1.57) participated in the study. Of them, 38 did not use a hormonal contraceptive.

Visual attention task. Participants sequentially saw ten computerized visual displays, each containing images of six products (cf. Janssens et al., 2001; Roskos-Ewoldsen & Fazio, 1992). For each display, the products were randomly arranged in a circle. Exposure to each display lasted one second after

which participants had 25 seconds to write down what they had seen. Each display contained one status product (Breitling watch, Porsche, Aston Martin, laser keyboard, exclusive mansion, I-mate, I-pod, Maserati, Mont Blanc pen, home cinema); the remaining five products were functional products (e.g., bucket, towel, bicycle,…). As we study attention to signals of male mate quality, we did not include typically feminine products (e.g., jewelry). In addition, to be able to show that the effect of ovulation on attention to status products is unconditional on the presence of men it was necessary that our experimental set-up did not include pictures of men. Therefore, we deliberately exposed participants to pictures of products, not to pictures of men with products. In line with previous research (e.g., Griskevicius et al., 2007), the status products were pretested to be more conspicuous (M_{status} = 5.03, *SD* = .34 vs. $M_{functional}$ = 1.96, *SD* =.89, $t(37.17) = 18.50$, $p < .001$) and expensive (M_{status} = 6.22, *SD* = .66 vs. $M_{functional}$ = 2.95, *SD* = 1.05, $t(58) = 9.46$, $p < .001$) than the functional products (scales from 1 to 7).

We tested our hypotheses using two measures: recall probability and recall position. As attention affects (strength of) encoding (e.g., Styles, 2005), we consider these recall measures as alternative, indirect measures of attention. To measure *recall probability*, we calculated the proportion of recalled status products (number of recalled status products divided by 10) as well as the proportion of recalled functional products (number of recalled functional products divided by 50). To measure *recall position*, per display, we determined a position score for the status product by tallying the reverse ordinal position in which it was recalled. So, in case four products were recalled, the status product received a score of 4 if it was recalled first and a score of 1 if it was recalled last. If the status product was not recalled, it received a score of 0. We summed the position scores across all displays and transformed this absolute score into a relative position score by dividing it by the total number of products recalled across all displays. Higher numbers indicate earlier recall of status products. Alternative coding schemes[4] yielded similar results.

Menstrual cycle data. After the attention task, participants indicated whether they used a contraceptive pill or other hormone based medicine and they indicated on a calendar when their last menstruation had started (day 1 of the menstrual cycle). Participants were divided in three cycle phase groups: the *menstrual phase* (days 1-5), the *fertile phase* (days 9-15), and the *luteal phase* (days 18-28; cf. Miller, Tybur, & Jordan, 2007). Studies relying on self-report data (e.g., Gangestad et al., 2007; Lukaszewski & Roney, 2009; Miller et al., 2007) obtained results that are consistent with studies using biological measures of hormone levels across the cycle (e.g., Haselton et al., 2007; Hill & Durante, 2009). Participants who reported an unusually long cycle, who fell in between two phases or who reported not to menstruate were excluded. At the time of the experiment, 9 normally cycling and 23 pill using women were in the

[4] *For instance a scoring scheme in which a status product's position score does not depend on the number of other products recalled from the same display (e.g., a status product that is recalled first always gets a score of 6).*

menstrual phase, 11 normally cycling and 25 pill using women were in the fertile phase and 12 normally cycling and 47 pill using women were in the luteal phase. The limited number of non-pill users results from random sampling. This small sample size has not comprised our analyses and results as we found no outliers that drive the obtained effects.

Based on their reported cycle-day we additionally estimated levels of estrogen and progesterone in normally cycling participants (cf. Martin & Behbehani, 2006). Because hormone levels were estimated instead of measured, this procedure may be a source of error. However, this introduction of random error diminishes the chance of finding relations between hormonal levels and our dependent variables rather than produces systematically biased estimates (Garver-Apgar, Gangestad, & Thornhill, 2008).

Results

Recall probability. A three-way GLM with Cycle Phase and Pill Use (pill vs. normally cycling) as between-subjects factors and Product Type (status vs. functional) as within-subjects factor was conducted on the proportion of recalled products. Consistent with our predictions, we found a significant three-way interaction, $F(2, 121) = 5.12$, $p = .007$ (figure 9). For the status products, we found no main effect of Pill Use, $F(1, 121) = 1.76$, $p = .19$, but a significant main effect of Phase, $F(2, 121) = 4.13$, $p = .02$. In the fertile phase women recalled more status products than in other phases.

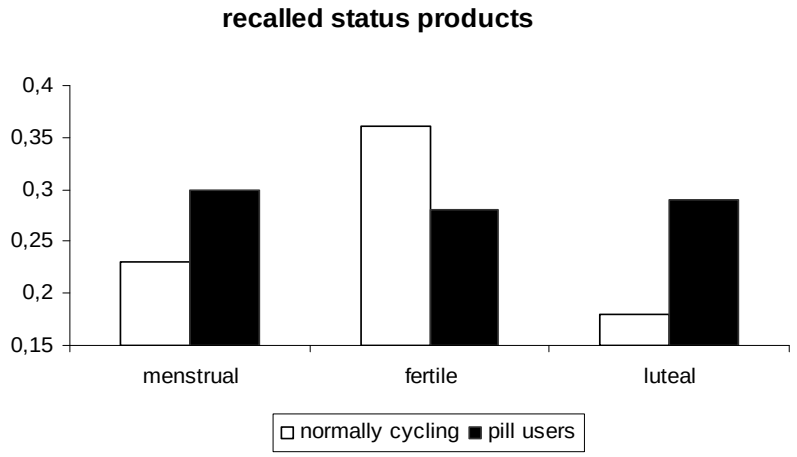
However, this main effect was entirely driven by a significant interaction with Pill Use, $F(2, 121) = 5.07$, $p = .008$. For normally cycling women, the proportion of recalled status products varied across the cycle, $F(2, 29) = 7.14$, $p = .003$. Around ovulation, they recalled a significantly larger proportion of status products ($M = .36$) than during other phases (both ps $< .03$), consistent with hypothesis 1. The difference between women in the menstrual ($M = .23$) and luteal phase ($M = .18$) was not significant ($p = .29$). For pill users, attention to status products did not differ across the cycle, $F (2, 92) = .14$, $p = .87$, supporting hypothesis 2. The proportion of recalled status products did not differ between normally cycling and pill using women in the menstrual phase ($p = .17$), but it did in both other phases, (both ps $< .05$*)*.

For the proportion of recalled functional products, we found a marginally significant main effect of Pill Use, $F(1, 121) = 2.87$, $p = .09$. Pill-using women recalled slightly more functional products than normally cycling women. More importantly, no main effect of Cycle Phase, or an interaction effect of Cycle Phase and Pill Use was found (both ps $> .43$) [5].

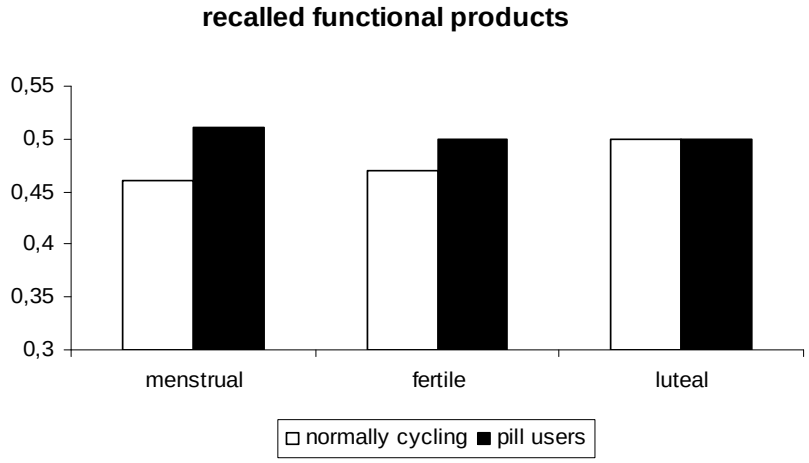
[5] *Note that the proportion of recalled status products is lower than the proportion of functional products. Indeed, three products (the watch and two of the cars) were recalled by half (or more) of the participants, whereas the remaining status products were recalled substantially less often. It seemed that some of the less recalled status products (e.g., the laser keyboard, the i-mate, or the home cinema system) were less familiar to the participants (compared to the cars and watch or most of the functional items) such that they*

Figure 9. Proportion of recalled products

A



B

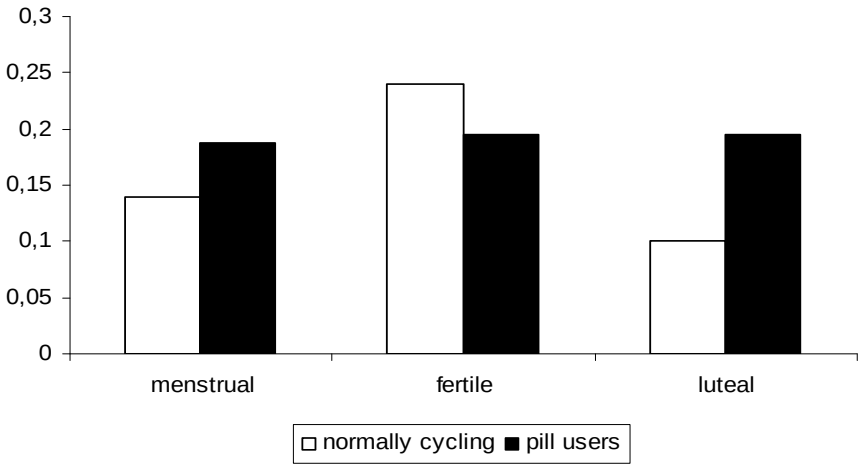


were harder to detect. In addition, it is possible that the cars were recognized more often because, due to their shape and color, they were more distinct than the other images in their display. Hence, although the status products were carefully pretested, we may also have manipulated other characteristics than merely their ability to signal status (e.g., distinctiveness, familiarity, complexity,…). To take these potential issues into account, we verified whether the obtained effects were driven by one specific status product or by the cluster of status products which are remembered more/less. However, none of the individual status products were responsible for the obtained effects and the same data pattern is found for the clusters of more and less often recognized status products.

Recall position. A two-way GLM with Cycle Phase and Pill Use as between-subjects factors on the recall position of the status products yielded no main effect of Pill Use, $F(1, 121) = 1.39$, $p = .24$, but a significant main effect of Phase $F(2, 121) = 5.97$, $p = .003$. Women in the fertile phase recalled status products earlier compared to other phases. However, this main effect was driven by a significant interaction with Pill Use, $F(2, 121) = 3.79$, $p = .03$ (figure 10).

For normally cycling women, recall position varied by cycle phase, $F(2, 29) = 7.63$, $p = .002$. They recalled status products significantly earlier in the fertile phase ($M = .24$) than in both other phases (both ps $< .02$). The position of status products recalled by participants in the menstrual ($M = .14$) and luteal phase ($M = .10$) did not differ significantly ($p = .31$). Pill users listed status products in the same relative position throughout their cycle, $F(2, 92) = .32$, $p = .72$.

Figure 10. Relative position of recalled status products



Estimated hormone levels. To check the robustness of our results, especially given the limited number of normally cycling women in our sample, we regressed the proportion of recalled status products and their recall position on estimated levels of estrogen and progesterone. Higher levels of estrogen were (marginally) significantly related to higher proportions of recalled status products, $\beta = .08$, $t(29) = 1.88$, $p = .07$, and to earlier recall, $\beta = .06$, $t(29) = 2.07$, $p = .047$. Higher progesterone levels were associated with smaller proportions of recalled status products, $\beta = -.005$, $t(29) = -2.10$, $p = .04$ and with later recall, $\beta = -.02$, $t(29) = -2.57$, $p = .02$. In addition, levels of estrogen and progesterone were not significantly related to the proportion of recalled functional products (both ps $> .41$).

Study 2

While the findings of study 1 show that ovulating women display an increased attention to status products, a question may be raised. We argued that during times of maximum fertility women spontaneously scan their environment for status cues with the aim of selecting a high-quality mating partner. An alternative explanation could be that women pay more attention to status products to achieve their mate attraction goal, rather than to pursue their mate selection goal.

On the one hand, there is no evidence that this would be a fruitful strategy (see also essay 2). Women with status do not receive more attention, whereas attractive women do (DeWall & Maner, 2008), and financial expenditures of women appear not to be related to their mating intentions or mating success (Kruger 2008). Also, status products may not directly enhance women's physical appearance (Dunn & Searle, 2010). On the other hand, it is possible that contemporary women, who are financially less dependent on their partners or families as they once used to be, do believe that their own conspicuous consumption increases their chances of attracting a desirable mating partner. In addition, considering that brand personalities may rub off on consumers (Park & John, 2010), possessing status products may induce feelings of confidence or sexiness. This, in turn, might influence women's behavior and, by consequence, attract men.

So, although it seems to be more adaptive for women to focus on their physical appearance, rather than on their status to secure their reproductive interests, further research is recommended to provide additional evidence for the assumption that women's elevated attention to status products around ovulation is not attributable to a mate attraction goal. Study 2 aims to provide more insight in this issue.

Method

Participants. One hundred and forty-two female students (M_{age} = 19.05, *SD* = 1.25) participated in the study. Of them, 50 did not use a hormonal contraceptive.

Dependent variables. To assess whether women themselves tend to engage more in conspicuous consumption behavior around ovulation, we adapted the conspicuous consumption measure of Griskevicius et al. (2007, study 2). Participants were instructed to imagine that they had €10,000 (~ $13,000) in their bank account and were considering buying some new things. They were asked to indicate how much they would like to spend on a number of items, some of which conspicuously display one's wealth and some of which do not display one's wealth (books and DVD's, household medication, bedroom alarm clock, kitchen staples, cleaning products). While in study 1 we only included products that men may

use to signal status, we now also included conspicuous products which are more relevant to women's dominant mate attraction strategy (appearing attractive). Hence, we included more female oriented products which may also be used to signal status (branded clothes, cosmetics, shoes, jewelry, perfume) and more male oriented products (such as in study 1; new watch, new cell phone, laptop, television, iPod). Rather than asking them to actually allocate resources, we asked participants to indicate whether they would spend less than, the same amount, or more than the average student of their age, sex, and university on each type of product. Answers were given on a 13-point scale (1 = > 50% less than others; 2 = 40% less than others; 7 = as much as others; 8 = 10% more than others; 13 = > 50% more than others).

An exploratory factor analysis on the scores for all 15 product types yielded a three-factor solution (female conspicuous products, male/unisex conspicuous products, and inconspicuous products). Internal consistency of the female (α = .85) and male/unisex (α = .80) conspicuous items and of the inconspicuous items (α = .79) was satisfactory such that the items for each factor could be averaged to form composite variables.

Menstrual cycle data. At the end of the session, menstrual cycle data were collected following the procedure of study 1. At the time of the experiment, 8 normally cycling and 15 pill using women were in the menstrual phase, 11 normally cycling and 21 pill using women were in the fertile phase and 17 normally cycling and 33 pill using women were in the luteal phase.

Results

Conspicuous products. A GLM analysis with Cycle Phase and Pill Use (pill vs. normally cycling) as between-subjects factors and Type of Conspicuous Product (unisex vs. female) as within subjects factor yielded no significant three-way interaction on spending intentions, $F(2, 98) = 1.00$, $p = .37$, but the two-way interaction between Pill use and Phase was significant, $F(2, 98) = 3.75$, $p = .03$. Hence, scores for both types of conspicuous products were averaged (α = .87) to form one composite variable measuring participants' conspicuous spending.

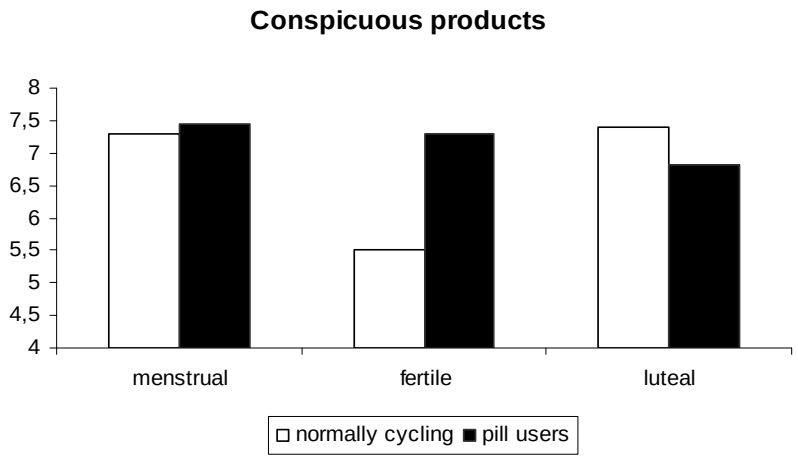
Next, we conducted a GLM analysis with Cycle Phase and Pill Use (pill vs. normally cycling) as between-subjects factors and Product Type (conspicuous vs. inconspicuous) as within subjects factor on the spending preferences for both types of products. The analysis yielded a significant three-way interaction, $F(2, 98) = 3.51$, $p = .03$. For the spending intentions on conspicuous products, the main effects of Cycle Phase, $F(2, 98) = 1.99$, $p = .14$, and of Pill Use, $F(1, 98) = 1.21$, $p = .27$, were not significant. However, we found a significant interaction effect between Cycle Phase and Pill Use, $F(2, 98) = 3.99$, $p = .02$ (figure 11).

For normally cycling women spending preferences for conspicuous products varied across the cycle, $F(2, 33) = 2.81$, $p = .07$. Around ovulation, they preferred to spend (marginally) significantly less on conspicuous products ($M = 5.52$) than during other phases (both ps < .085). The difference between women in the menstrual ($M = 7.21$) and luteal phase ($M = 7.40$) was not significant ($p = .91$). For pill users, spending preferences did not differ across the cycle, $F(2, 65) = 1.10$, $p = .34$. Spending preferences differed between normally cycling and pill using women in the fertile phase ($p = .007$), but not in both other phases, (both ps > .28*)*. These findings suggest that ovulating women, as compared with pill using women and with normally cycling women during other phases of their cycle, indicate to spend *less* on conspicuous products.

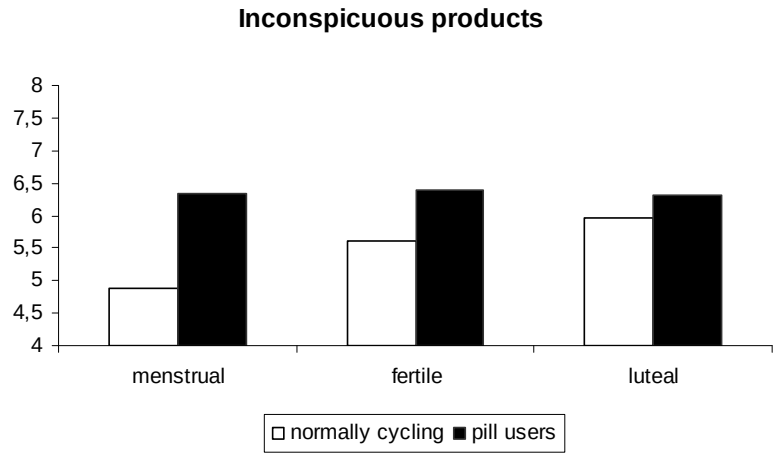
For the inconspicuous products, we found a significant main effect of Pill Use, $F(1, 98) = 8.63$, $p = .004$, but not of Cycle Phase, $F(2, 98) = 2.98$, $p = .34$. Overall, normally cycling women revealed lower spending intentions on inconspicuous products ($M = 5.48$) than pill using women ($M = 6.34$). More importantly, the interaction between Cycle Phase and Pill Use was not significant, $F(2, 98) = 1.19$, $p = .31$.

Figure 11. Spending intentions on conspicuous and inconspicuous products

A



B



General discussion

The current essay shows that ovulating women display an increased attention to status products. In a visual attention task, normally cycling women listed more status products and listed them earlier in the fertile phase than in other phases of the menstrual cycle. Women who used a hormonal contraceptive pill displayed no differences in attention to status products throughout their cycle. In addition, the data showed that normally cycling women in their fertile phase recalled more status products than pill users in the same phase of their cycle did. This pattern was reversed for women in the luteal phase. These findings are consistent with the general notion that the activation of a goal, such as a mate selection goal, directs individuals' attention to goal-relevant stimuli (Bruner, 1957; Moskowitz, 2002). Indeed, the relevance of mating goals is likely to decrease temporarily a few days after ovulation, which may explain the difference in recall of status products between normally cycling and pill using women in the luteal phase.

Interestingly, we found the predicted effect even without the inclusion of pictures of men in the visual attention task. Hence, the effect of female sex hormones on attention to status cues may not require the presence of potential mating partners. This renders the effect more relevant to a consumer context as ovulation may increase attention to status products in general (for instance in a store or in advertising), not just to status products that are flaunted by men.

These findings suggest that biological processes, such as the flow of hormones, may affect attention. While we used indirect measures of attention (recall probability and recall position) future research may involve a dot-probe procedure (e.g., MacLeod, Mathews, & Tata, 1986) or use eye-tracking methodology to measure visual attention directly. In addition, while prior studies have suggested that

women favor men with status (e.g., Kenrick et al., 1990), this may reflect deliberate preference construction. Our findings suggest that this preference may be more deeply rooted as women not only spontaneously pay attention to status products–even in the absence of (pictures of) men–but also that this attention may fluctuate depending on the activation of (mating) goals.

Despite its contribution, the current essay also has its limitations and holds a number of opportunities for future research. First, while we argued that an activated mate selection goal may guide ovulating women's attention towards status products, we did not actually test this assumption. Hence, it is possible to come up with alternative explanations for the documented data patterns. One obvious alternative explanation is that women's attention to status products is driven by a mate attraction goal, rather than a mate selection goal. Study two aimed to rule out this explanation. Normally cycling women in the fertile phase did not reveal a preference for conspicuous consumption, not even for typically feminine status products. In fact, the data even showed the opposite pattern. Namely, ovulating women indicated to engage *less* in conspicuous consumption behavior compared to women in other phases of their menstrual cycle. While this does not mean that ovulating women do not spend money—they seem to do so when their spending clearly enhances their appearance (Hill & Durante, 2007)—it does imply that they prefer not to spend money simply to boost their status.

However, the possibility still exists that ovulation instigates an interest in or attention to status products without necessarily involving the activation of a mate selection goal. For instance, it is possible that ovulation produces feelings of uncertainty—evidence suggests that women's self-esteem may drop around ovulation (Hill & Durante, 2007)—which, in turn, may lead to a general sensitivity to (financial) resources. However, around ovulation, women's interest in (financial) resources seems to be overruled by an interest in good genes (Gangestad et al., 2007; Haselton & Miller, 2006; for a review on short- vs. long-term mate preferences, see Gangestad & Simpson, 2000). Hence, women's increased attention to status signals around ovulation may reflect an increased interest in genetic fitness rather than in financial resources. Recent findings indeed suggest that status product consumption may function as a short-term mating strategy, rather than as a long-term strategy aimed at signaling financial prosperity (Sundie et al., 2011). Our findings are consistent with this proposition.

In addition, if ovulating women's attention to status products may be interpreted as a generalized interest in resources, we would have expected to find an increased interest in conspicuous consumption in study 2; we found the opposite pattern. Still, one could argue that the specific characteristics of the conspicuous consumption task may have induced feelings of resource abundance. After all, participants were instructed to imagine that they had quite a bit of money in their bank account prior to the actual conspicuous consumption measure. Possibly, this has influenced our results.

In order to shed more light on the mechanism underlying our findings (e.g., an activated mate selection goal or more general processes activated by ovulation, for instance a heightened interest in resources or perhaps even a generalized reward sensitivity), future research may investigate whether the pattern of attention to status products around ovulation differs for single women versus for women in a relationship. If a mate selection goal drives the obtained results, we expect to find a stronger effect for single women (whose mate selection goal has not yet been achieved) than for women in a relationship. Consistently, single men in a mating mindset displayed more attention to status products than men in a relationship in a similar visual attention task as the one used in study 1 (Janssens et al., 2011). If the data pattern is not driven by an activated mate selection goal, relationship status may matter less. In addition, one may, for instance, test whether women's desire for money (cf. Briers, Pandelaere, Dewitte & Warlop, 2006) is augmented around ovulation or whether ovulating women display higher intertemporal discounting (Van den Bergh, Dewitte, & Warlop, 2008). Although not reported due to the difficulty of interpreting null results, we included a measure of desire for money (cf. Briers et al., 2006, study 3) and a measure of intertemporal discounting in study 2. None of these measures fluctuated across the menstrual cycle.

Related to the previous comment, a limitation of the current studies pertains to the self-selection of participants in both pill using and normally cycling conditions. As a result, participants were not randomly divided across conditions and it is likely that participants in both conditions may have differed on relevant characteristics. For instance, the fact that we found such a pronounced effect of ovulation on women's attention to status products for normally cycling women despite the limited number of participants, may have been due to a relatively large share of single participants in this condition. While our dataset was too small to test this assumption, future research may take this into account.

Next, we argued in the introduction that conspicuous consumption is a very ambiguous signal for male reproductive qualities or for overall wealth (Colarelli & Dettmann, 2003; Gallup & Frederick, 2010) as the possibility to incur debt has given men without resources and good genes access to status products. Still, women's spontaneous attention to status products may not only result from evolutionary selection processes at times when conspicuous consumption was a less ambiguous signal, but may also continue to serve some function. In particular, status products may help women to initially focus on a subset of potential mates. Possibly, women may engage in more deliberate processing to eliminate non-suitable mates from this subset. Future research might thus investigate the conditions under which men's conspicuous consumption stimulates actual approach behavior in women and how consumption signals of status are integrated with physical signs of status.

Finally, while striving for wealth is assumed to be shallow and even negative for one's well-being (e.g., Kasser & Ryan, 1993), our findings demonstrate that men's display of status products may have

benefits in a mating context. Indeed, although drawing women's attention may not be the ultimate goal of men in a mating mindset, our findings confirm that men's efforts to seduce women using conspicuous status symbols might not go unnoticed at times they really matter.

ESSAY 3B:

ROMANTIC MOTIVES AND MEN'S CONSPICUOUS CONSUMPTION BEHAVIOR: THE ROLE OF MATERIALISM

Abstract

While prior research demonstrated that mating goals trigger men's interest in conspicuous consumption, this essay further explores the conditions under which this occurs. More specifically, we show that materialism moderates the relationship between the activation of men's mating goals, and their engagement in conspicuous consumption behavior. In addition, we show that materialistic men tend to choose partners who possess characteristics that help them to fulfill their own need for social approval. So, for materialistic men, their partner may fulfill a similar function as conspicuously displayed status products.

Introduction

An increasing body of research within the field of evolutionary psychology has shown that men's engagement in conspicuous consumption behavior may fulfill a communicative function in a mating context (Griskevicius, et al. 2007; Miller, 2009; Saad, 2007; Sundie et al., 2011). In particular, in response to women's preference for men with status (Colarelli & Dettmann, 2003; Kenrick, Sadalla, Groth, & Trost, 1990), men in a mating mindset show an increased interest in status-signaling products (Griskevicius et al., 2007; Janssens et al., 2011). In a different line of research focusing on the consequences of a material value orientation, it is argued that conspicuous consumption is a typical behavior for materialistic individuals to engage in. A combination of both streams of research leads to the prediction that in particular materialistic men will strategically engage in conspicuous consumption behavior to attract female mating partners. Testing the validity of this prediction is important for a number of reasons.

First, while the relationship between mating motives and conspicuous consumption is well-documented, relatively little is known about the conditions which evoke this mating strategy. This essay links men's reliance on conspicuous consumption to attract women to a fairly stable individual difference variable, namely materialism.

Second, an exception to the previous argument can be found in recent work by Sundie and colleagues (2011). They show that men's engagement in conspicuous consumption behavior in a mating context may be a signal of short-term mating interest, rather than long-term commitment. This could imply that materialistic men may also be more inclined (than non-materialistic men) to pursue short-term mating goals. Consistently, materialistic men may be stronger inclined to desire partners who are sexy or highly attractive, characteristics which are especially important in the short run (Kenrick et al., 1990). Interestingly, to our knowledge little research has investigated the relationship between materialism and (men's) mating goals and partner preferences. The second aim of the current paper is to provide more insight in this matter.

Apart from testing the potential influence of short term mating goals, we also take into account the fact that materialism is related to extrinsic (relative to intrinsic) goal pursuit (e.g., Kasser, 2002). Also from this perspective it may be interesting for materialistic men to engage in a mating strategy which is most likely to lead to the attraction of attractive and socially visible partners. Indeed, we will show that materialistic men are inclined to prefer partners who possess characteristics that help them to fulfill their need for social approval. In other words, for a materialistic man, his partner may have–at least to some extent–a similar function as conspicuously displayed status products.

Finally, while materialism has been theoretically linked to conspicuous consumption, empirical evidence for this relationship is relatively scarce. Our findings support the assumption that materialism is related to conspicuous consumption, at least for men in a mating context.

Theoretical background

Sex differences in parental investment have led to differences in partner preferences (Bjorklund & Shackelford, 1999; Trivers, 1972). In comparison to men, women have a shorter reproductive lifespan and they typically devote more time and effort in raising their offspring (Bjorklund & Shackelford, 1999; Kenrick, Groth, Trost, & Sadalla, 1993). Consequently, women benefit most from being choosy in selecting their mating partners. Prior research has found that women are particularly likely to favor men with status and (financial) resources (Buss, 2004; Colarelli & Dettmann, 2003; Kenrick, Sadalla, Groth, & Trost, 1990; Li, Bailey, Kenrick, & Linsenmeier, 2002). Although one may signal status in many different ways (e.g., through one's intelligence or social dominance), a person may attempt to signal status through possessions (Belk, Bahn & Mayer, 1982). Consequently, men in a mating mindset have evolved an interest in status-signaling products (Griskevicius et al., 2007; Janssens et al., 2011; Sundie et al., 2011).

So, from an evolutionary psychological perspective, status products are particularly interesting given their potential role as signals of mate value (De Fraja, 2009), in particular for men. Indeed, men's ability to spend money on expensive products may communicate information about their wealth (Veblen, 1899) and, perhaps more importantly, also about their genetic quality (Miller, 2009; Sundie et al., 2011). After all, only men who possess valuable underlying qualities may successfully carry the cost of spending resources on seemingly wasteful products (Sundie et al., 2011).

However, recent findings suggest that not all men may rely equally strongly on conspicuous consumption to signal their mate value to desirable prospects (Sundie et al., 2011). The current paper aims to further advance our insight in the prevalence of conspicuous consumption as a male mating strategy by showing that materialism moderates the extent to which men consider possessions as tools to gain reproductive rewards.

Materialism, conspicuous consumption, and mating strategies

In recent consumer research materialism is conceptualized as a set of values and beliefs held by consumers who consider the accumulation of wealth as a primary source of happiness and view it as a

signal of one's success in life (Burroughs & Rindfleisch, 2002; Richins & Dawson, 1992). These values and beliefs in turn influence individuals' (choice) behavior in diverse contexts (Richins & Dawson, 1992), often in a negative way. For instance, materialism has been related to a short-sighted consumption pattern, including overspending and debt (Richins, 2011; Watson, 2003), compulsive buying behavior (Dittmar, 2005) and–most relevant to the current research–conspicuous consumption behavior (Richins, 1994a; Wong, 1997).

Although surprisingly little research empirically tested the relationship between materialism and conspicuous consumption, it has been argued that this presumed relationship is likely to follow from materialists' belief that possessions are the most important means to display success and status (Wong & Ahuvia, 1998). Hence, materialistic individuals are likely to engage in conspicuous consumption behavior when they wish to augment or display their status. Consequently, also in a mating context materialistic men may be particularly inclined to rely on their resources and possessions to convince women of their status.

This prediction is less obvious than it may seem at first sight. Given women's general preference for men with wealth and status (Buss, 2004; Colarelli & Dettmann, 2003; Kenrick, Sadalla, Groth, & Trost, 1990; Li, Bailey, Kenrick, & Linsenmeier, 2002), it is possible that men scoring low on materialism may also exploit the benefits of conspicuous consumption in a mating context, while they may refrain from such behavior in other circumstances. To shed more light on this matter, the current paper tests the relationship between materialism and conspicuous consumption in a mating context.

This proposed relationship between materialism and men's conspicuous consumption in a mating context also triggers a number of additional questions. For instance, while their financial resources may help men to signal their interest in a committed relationship (e.g., when being spent on a safe, family-sized car), they appear to have the opposite effect when being spent on conspicuously flaunted luxuries (Sundie et al., 2011). After all, while men's ability to lavishly spend money on status products may be an indicator of genetic quality (which is particularly important in short-term sexual encounters), this behavior may not signal/produce long-term financial stability. So, because conspicuous consumption signals short-term (rather than long-term) mating motives (Sundie et al., 2011), engaging in it may make a long-term relationship less likely. Given that materialism is assumed to be the result of deep-rooted uncertainty feelings (Chang & Arkin, 2000; Chaplin & John, 2007; for a review, see Kasser et al., 2004), one could conjecture that materialists will strive for stable and secure long-term relationships in an attempt to cope with their insecurity. However, if materialism predicts men's engagement in conspicuous consumption in a mating context, it requires further testing to find out which motivations or benefits may underlie or sustain this behavior.

On the one hand, it is possible that materialistic men (compared to men scoring low on materialism) indeed have a more positive attitude towards short-term sexual encounters, irrespective whether committed relationships may provide more security in the long run. For instance, the fact that materialists are likely to be self-centered, to display little empathy, or to experience poor interpersonal relationships (Richins & Dawson, 1992; Sheldon & Kasser, 1995; Solberg, Diener, & Robinson, 2004) could be interpreted as a signal of low ability or willingness to display relational commitment.

On the other hand, however, materialistic men may not prefer uncommitted relationships per se, yet they may have a strong interest in a specific benefit they may gain from pursuing a short-term mating strategy. Given the fact that women seem to recognize conspicuous consumption as a signal of short-term sexual interest (Sundie et al., 2011), those women who will be attracted by such a mating strategy are likely to be motivated by short-term mating goals as well. Especially for these women it is important to appear attractive and sexy, as men with an unrestricted sociosexual orientation tend to have a more pronounced preference for women who are highly attractive and socially visible (Simpson & Gangestad, 1992). Hence, pursuing a short-term mating strategy may be a fruitful strategy to attract the attention of women who pay much attention to their looks and overall physically appearance. Because materialists care much about their social image (Chan & Prendergast, 2007; Richins & Dawson, 1992; Rose & DeJesus, 2007) and are strongly extrinsically motivated (Kasser, 2002; Kasser & Ahuvia, 2002), pursuing a short-term mating strategy could thus allow them to better fulfill their need for social approval as this strategy may lead to the attraction of good-looking and socially visible partners. In other words, materialistic men may attempt to fulfill their own extrinsic goals by attracting and flaunting a good-looking and highly desirable romantic partner.

In sum, this essay explores the relationship between materialism, mating goal activation, and interest in money and status-signaling products. In particular, study 1 examines whether materialistic men are in general more inclined to rely on their financial resources in a mating context than men scoring low on materialism. In study 2 we show more directly that materialistic men's interest in status-signaling products increases after a real-life encounter with an attractive woman. In study 3, we shed more light on potential motives underlying materialistic men's mate attraction strategy. In particular, we will show that materialistic men's partner choice (which is related to their mating strategy) is strongly influenced by their need for social approval.

Study 1

Method

Participants. Forty male students varying in age from 18 to 24 years, (M_{age} = 19.23, SD = 1.25) participated in an online questionnaire in return for partial course credit.

Procedure. For eight different characteristics (financial resources, humor, intelligence, physical attractiveness, masculine body, caretaking abilities, faithfulness, and status) which may be appealing to women in a mating context, participants were instructed to indicate to what extent they relied on each of these characteristics to attract women. Each characteristic was judged on a seven-point scale anchored with *not at all important to me* and *highly important to me*.

Next, we assessed participants' level of materialism with the Material Values Scale (Richins & Dawson, 1992). The scale consists of 18 items, measured on a seven-point scale anchored *with totally disagree* and *totally agree*. Negatively worded items were reverse coded to assure that high scores indicate high levels of materialism. Scale items were averaged (α = .90) to form an index of participants' level of materialism.

Results

Pearson correlations were calculated between materialism and ratings for each of the eight characteristics to assess which characteristics increase in importance as a mate attraction strategy with increasing levels of materialism. Correlations are summarized in table 2. As predicted, materialistic participants reported to rely more on their financial resources to attract mating partners than participants with low levels of materialism.

In addition, signaling status increased in importance as a male mating strategy as men became more materialistic, consistent with the idea that signaling wealth through products is ultimately aimed at improving one's status (Veblen, 1899). Finally, materialistic men (compared to men scoring low on materialism) expressed to rely less on their abilities as good caretakers to attract a partner, yet they were inclined to consider faith as an important characteristic to attract women.

Table 2. Correlations between materialism and mating strategies

	Mat.	Fin. res.	Humor	Intell.	Physical att.	Masc.	Caret. abilities	Faithful.	status
Materialism	1.00								
Financial resources	.56**	1.00							
Humor	.09	.01	1.00						
Intelligence	.19	.23	.24	1.00					
Physical attractiveness	.12	-.03	.25	-.18	1.00				
Masculinity	.04	.09	.20	.06	.26	1.00			
Caretaking abilities	-.31*	-.20	-.20	-.16	-.16	.06	1.00		
Faithfulness	.29†	.16	-.06	.27†	-.06	-.08	.33*	1.00	
status	.30*	.62**	-.08	.16	-.13	.04	-.02	.10	1.00

** $p < .001$; * $p < .05$; † $p < .10$

Study 2

While study 1 suggests that materialistic men are more inclined to use their wealth as a tool to attract women, study 2 assesses more explicitly whether the activation of men's mating motives increases materialistic men's interest in products which conspicuously signal status.

Method

Participants. One-hundred seventeen male students varying in age from 18 to 32 years, (M_{age} = 20.07, SD = 1.79) participated in the experiment in return for a participation fee. Every fifteen minutes one participant individually entered the lab. Upon arrival to the lab, participants first engaged in a brief interaction with a female experiment leader. Afterwards they filled out a number of questionnaires, most of which unrelated to the present study.

Mating goal activation. The activation of participants' mating goal was manipulated by the presence of the female experiment leader. In the *mating condition*, participants briefly interacted with a sexily dressed experiment leader (wearing a short skirt, high heels, a fairly revealing top, and make-up), whereas participants in the *control condition* interacted with the same female experiment leader, yet dressed in plain attire (wearing trousers, regular shirt, flat shoes, glasses and no make-up). Participants

were randomly assigned to one of both conditions. The experiment leader was unaware of the specific hypotheses of the experiment.

Dependent Measure. After the interaction with the female experiment leader, participants were shown pictures (cf. appendix 4) and a short description of eight products (ordered randomly): four rather unusual, conspicuous gadgets (iPod watch, design USB stick, key chain with digital picture screen, and a fingerprint reader) and four more regular, functional products (white shirt, large black mouse pad, regular key chain, lanyard). Participants rated the attractiveness of each product on a seven-point scale anchored with *not at all* and *very.*

In addition, they indicated on a seven-point scale for each product to what extent people would buy it to show off and they indicated how expensive they thought the product was (in €). In line with relevant previous research (e.g., Griskevicius et al., 2007; Sundie et al., 2011), the gadgets scored highest on both dimensions (showing off: $M_{gadgets}$ = 4.95, SD = .97 vs. $M_{functional}$ = 2.06, SD = .81, $t(116) = 27.73$, $p < .0001$; expensive: $M_{gadgets}$ = 75.43, SD = 33.50 vs. $M_{functional\ =}$ 7.41, SD = 3.40, $t(116) = 22.20$, $p < .0001$). This confirms that our set of products comprised products that were more (gadgets) and less (functional products) suitable for individuals wanting to engage in conspicuous consumption behavior, as intended.

Materialism. After a number of unrelated tasks, we assessed participants' level of materialism with the Material Values Scale (Richins & Dawson, 1992). Scale items were averaged ($\alpha = .83$) to form an index of participants' level of materialism.

Results

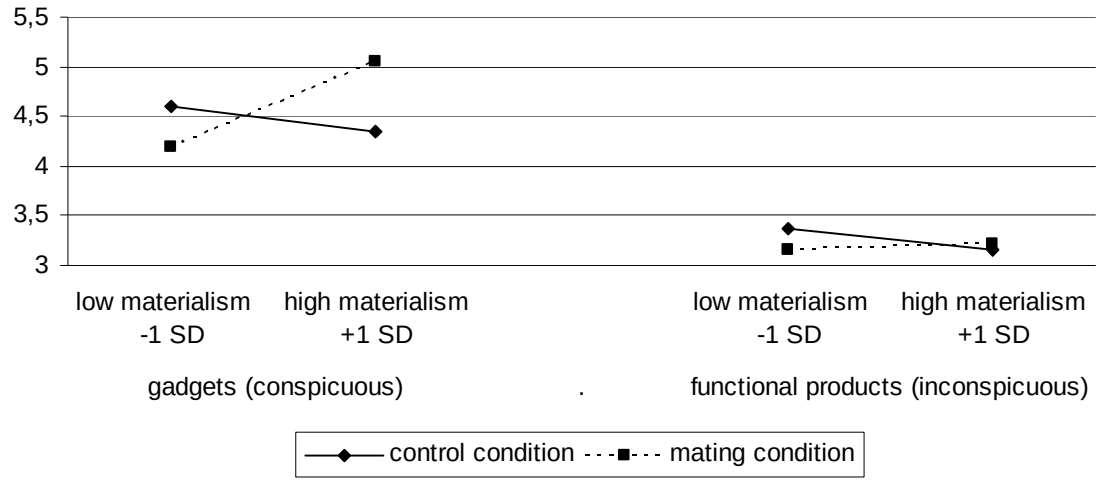
We predicted that a mating mindset would increase men's interest in conspicuous consumption, in particular when they score high on materialism. Hence, we expected that participants in the mating condition would find the gadgets more attractive as a function of their level of materialism. However, to show that this interest is specific to conspicuous consumption, not to consumption in general, it is important that these effects are found for the gadgets, but not for the functional products.

In line with our predictions, a GLM analysis with Materialism and Condition (mating vs. control condition) as between subjects factors and Product Type (gadget vs. functional product) as within-subjects factor, yielded a significant interaction between Materialism, Condition, and Product Type, $F(1, 113) = 3.99$, $p = .048$. For the gadgets, no significant main effect of Condition, $F(1, 113) = .56$, $p = .46$, but a significant main effect of Materialism, $F(1, 113) = 4.08$, $p = .046$, was found. Overall, attractiveness ratings increased

with increasing materialism. However, this main effect was qualified by a significant interaction with Condition, $F(1, 113) = 13.97$, $p = .0004$.

Spotlight analysis (Aiken & West, 1991) revealed that participants scoring high on materialism (1 SD above the mean) found the gadgets more attractive in the mating condition than in the control condition, $t(113) = -3.09$, $p = .003$, while the reverse (although marginally significant) was true for participants scoring low on materialism (1 SD below the mean), $t(113) = 1.84$, $p = .07$, (figure 12). In addition, the regression slope was significant in the mating condition, $t(113) = 4.26$, $p < .0001$, but not in the control condition, $t(113) = -1.06$, $p = .29$. For the functional products, no significant effects were found on attractiveness ratings (all Fs < 1.80, all ps >. 18).

Figure 12. Attractiveness ratings of gadgets and functional products



Discussion

In sum, study 1 suggested that materialistic men tend to rely on their financial resources in a mating context, while they are less inclined to focus on their caretaking qualities. Study 2 found that the activation of mating goals increases interest in status-related products for materialistic men, not for men scoring low on materialism. Hence, these results suggest that materialistic men tend to engage in a mating strategy that is recognized by women as a signal of low commitment or an unrestricted sociosexual orientation (cf. Sundie et al., 2011, study 4). However, study 1 also showed that materialistic men tend to value faith as an important characteristic to attract women. While this may be the result of socially desirable responding, this result stresses the relevance of empirically testing the relationship between materialism and short- versus long-term mating goal pursuit.

Study 3 aims to expand the findings of studies 1 and 2 in three ways. Concretely, study 3 explores a) whether materialism not only predicts a specific mate attraction strategy, but also a more general interest in short (versus long) term mating, b) whether, consistently, materialism predicts a preference for socially visible and attractive partners (characteristics which are especially relevant in the short run), and c) whether an unrestricted sociosexual orientation or a motivation to pursue extrinsic goals (e.g., striving for success, status, or physical attractiveness) may account for these partner preferences.

Study 3

Method

Participants. One-hundred fifty-one male students varying in age from 17 to 32 years, (M_{age} = 19.89, SD = 1.72) participated in the experiment in return for partial course credit. Participants were seated in separate cubicles such that they would not interact during the course of the experiment.

SOI and Partner choice. To assess participants' short-term mating interest, participants filled out the seven-item sociosexual orientation inventory (SOI) of Simpson and Gangestad (1991). Consistent with the recommendations of Webster and Bryan (2007), we calculated indices of the behavioral and the attitudinal items of the SOI separately. Two items (SOI2 *How many different partners do you foresee yourself having sex with during the next five years?* and SOI4 *How often do you fantasize about having sex with someone other than your current dating partner?*) were dropped to increase the internal consistency of both sets of items ($\alpha_{behavior}$ = .68, $\alpha_{attitude}$ = .75). Consistently, Webster and Bryan (2007) showed that these items have the lowest loadings on, respectively, the behavioral and the attitudinal latent factor underlying the SOI. Because we did not obligate participants to provide answers to the SOI items due to the sensitivity of their content, some participants did not provide answers to the items measuring SOIbehavior. For these items N = 139.

Next, participants read descriptions of two hypothetical romantic partners (cf. Simpson & Gangestad, 1992). Description A depicted a women who scored high on characteristics related to social visibility and attractiveness (sexy, admired by others), but low on characteristics associated with commitment and stable personality (less responsible life-style, not always faithful). Description B portrayed a woman who scored high on dimensions valued in a long-term partner (caring, responsible, faithful,…), but who scored lower on sexiness, attractiveness, or social admiration. Participants were asked to choose which of both descriptions corresponded best to their ideal long-term romantic partner.

Extrinsic goal pursuit and materialism. After a number of unrelated tasks, we assessed participants' level of extrinsic (relative to intrinsic) goal pursuit with an adapted version of the aspiration index (Kasser & Sheldon, 2000; Vansteenkiste, Duriez, Simons & Soenens, 2006) to assess their motivation to gain social approval. Mean scores on three subscales (each consisting of 3 items) measuring the importance attached to financial success, social recognition, and physical attractiveness (α = .84) served as a measure of extrinsic goal pursuit. Three different subscales (each consisting of 3 items) measuring the importance attached to affiliation, self-acceptance, and community feelings were averaged (α = .76) to form an index of intrinsic goal pursuit. All items were scored on a seven-point scale anchored with *not at all important to me* and *very important to me*. To obtain scores reflecting the relative importance of extrinsic goal pursuit, scores for the intrinsic items were subtracted from the extrinsic items (cf. Sheldon & Kasser, 2008; Kasser, 2002)[6]. Participants' level of materialism was again assessed with the Material Values Scale (Richins & Dawson, 1992). Scale items were averaged (α = .82) to form an index of materialism.

Results

Studies 1 and 2 suggested that materialistic men tend to follow a mating strategy that was previously found to signal low investment (Sundie et al., 2011). Pearson correlations between materialism, SOIbehavior and SOIattitude reveal that, indeed, the attitudinal component of the SOI increased with increasing materialism (r = .25, p = .002). However, the correlation between materialism and the behavioral component of the SOI was not significant (r = -.02, p = .84). In other words, although materialistic men do not report more unrestricted sexual encounters (in the past or expected in the future), they are more inclined to reveal a positive attitude towards unrestricted sexual encounters as compared with men scoring low on materialism. In addition, SOIattitude was positively correlated with relative extrinsic goal pursuit (r = .29, p = .0003).

These findings suggest that materialistic men may also be more likely to favor description A (socially visible/attractive partner) over description B (responsible/caring partner) when choosing their preferred romantic partner. To test this assumption, we conducted a logistic regression analysis in which we regressed participants' choice on their levels of materialism. Overall, 109 participants (72%) chose partner B as their ideal romantic partner. Forty-eight participants (28%) preferred partner A. However, as predicted, the probability of choosing partner B (instead of A) decreased with increasing levels of materialism, β = -.56, $\chi^2(1)$ = 4.46, p = .03. In addition to materialism, we also conducted logistic regression

[6] *One could also calculate a measure of relative extrinsic goal pursuit by subtracting the importance attached to all aspirations from the importance attached to extrinsic goals (e.g., Kasser & Ahuvia, 2002) or one could consider in- and extrinsic goal pursuit as separate, correlated constructs. In our study each of those methods yielded similar results.*

analyses with SOIattitude and relative extrinsic goal pursuit separately included as predictors. In line with expectations, the probability of choosing partner B decreased significantly with increasing levels of SOIattitude, β = -.22, $\chi^2(1) = 4.51$, p = .03, as well as with increasing levels of relative extrinsic goal pursuit, β = -1.01, $\chi^2(1) = 13.48$, p = .0002.

In a second logistic regression model, we added both materialism and SOIattitude as predictors to the model. Both the effect of materialism, β = -.45, $\chi^2(1) = 2.74$, p = .098, and of SOIattitude, β = -.19, $\chi^2(1)$ = 3.04, p = .08, remained marginally significant. In a third model, we added relative extrinsic goal pursuit to the model as an additional predictor. As expected, the probability of choosing partner B instead of A significantly decreased with increasing levels of extrinsic goal pursuit, β = -1.01, $\chi^2(1) = 9.37$, p = .002. The effect of materialism on participants' choices now became insignificant, β = .14, $\chi^2(1) = .16$, p = .69.

Discussion

In sum, the findings of study 3 suggest that materialistic men are more likely than men scoring low on materialism to favor romantic partners who possess characteristics that are socially valued and visible (i.e., conspicuous) than partners who are typically recognized as desirable long-term mating partners. This preference appears to be more strongly driven by materialistic men's desire for approval and admiration of others (measured by their relative extrinsic goal pursuit) than by a positive attitude towards unrestricted sexual encounters (i.e., short-term mating goals).

General discussion

While prior research highlighted the relevance of studying conspicuous consumption behavior through an evolutionary lens, this essay provides more insight in the conditions under which men's mating goal activation triggers interest in conspicuous consumption. In particular, this essay investigated the moderating role of materialism in the relationship between the activation of men's mating motives, and their engagement in conspicuous consumption behavior. More concretely, study 1 showed that men's reliance on their financial resources as a means to attract women increased with increasing levels of materialism. In addition, study 2 replicated the finding that men in a mating mindset were more attracted to products which can signal status (see also Griskevicius et al., 2007; Janssens et al., 2011; Sundie et al., 2011), yet, consistent with our predictions, this was particularly true for materialistic men. Men scoring low on materialism even tended to reveal a decreased interest in status-signaling products in a mating context.

These findings confirm our assumption that not all men may be equally strongly inclined to engage in conspicuous consumption behavior in an attempt to attract women.

In addition, this essay provides some insight in the effect of materialism on men's partner choice and in the motives guiding this choice. Financial resources may fulfill two functions in a mating context (Sundie et al. 2011): they may signal that their owner is a desirable prospect for a long-term committed relationship or they may signal their owner's interest in short-term uncommitted relationships, especially when being spent on conspicuous status products. Study 3 suggested that materialistic men's (short-term) need for social approval is likely to have a strong influence on their partner choice. A mate attraction strategy involving conspicuous consumption behavior is consistent with this.

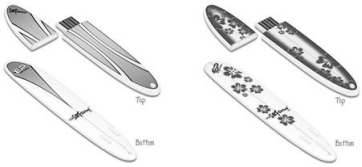
Despite these contributions, this paper also raises a number of questions for future research. First, prior research has shown that men's conspicuous consumption may draw women's attention, in particular when women are fertile and thus most sensitive to cues of mate quality (Lens, Driesmans, Pandelaere, & Janssens, 2012, cf. essay 3a). Interestingly, ovulation also appears to temporarily increase women's short-term mating interests. For instance, around ovulation women tend to evaluate men as short-term partners (Buss, 2004; Gangestad, Garver-Apgar, Simpson, & Cousins, 2007). Hence, ovulating women may be more receptive to the mating strategy of materialistic men. In addition, ovulating women may also more strongly resemble materialists' ideal partners. Indeed, they aim to look more sexy and attractive, and they are more likely to visit places where they have the opportunity to meet men (Durante et al., 2011; Haselton & Gangestad, 2006; Haselton et al., 2007; Hill & Durante, 2009). Together, this seems to imply that materialism, from a short-term mating perspective, could be considered as a beneficial trait. This idea is fairly unusual given the abundance of research documenting the negative consequences of materialism (for an overview see Burroughs & Rindfleisch, 2002), yet requires further testing.

Furthermore, the correlational nature of the results of study 3 renders their interpretation somewhat problematic. For instance, study 3 offers little insight in the reason why materialism is related to a positive attitude toward unrestricted relationships. Also, we argued and showed that an extrinsic motivation to achieve status may underlie materialistic men's partner preference, yet it is unclear whether this motivation also underlies their short-term mating strategy or, in other words, whether materialistic men intentionally engage in a specific mating strategy (involving conspicuous consumption) to better achieve their extrinsic goals (i.e., through the partners they may attract with this mating strategy). Future research is therefore warranted to shed more light on the motivations which drive materialistic men's positive attitude towards unrestricted sexual encounters and their preference for a mating strategy involving conspicuous consumption.

In sum, this paper qualifies the finding that men engage in conspicuous consumption behavior to attract women (Griskevicius et al., 2007; Sundie et al., 2011) by showing that in particular materialistic men

are likely to rely on their possessions and wealth in a mating context. In doing so, these findings also contribute to the materialism literature. While prior research has shown that materialists place much value on the acquisition of (status-conveying) possessions (Richins & Dawson, 1992), our findings suggest that they are also more likely to use these possessions to attract a mating partner. In fact, our findings suggest that materialistic men may even consider their partner as a *tool* to obtain a desired outcome, namely social approval. So, while future research would benefit from a deeper exploration of the consequences of materialism for romantic relationships (and by extension for all social relationships), our findings at least suggest that men who overtly flaunt status products and brands are more likely to search a trophy wife than a good mother to their children.

Appendix 4. **Products study 2**

Functional products	Gadgets
	
	
	
	

GENERAL DISCUSSION

In four essays, I aimed to shed more light on the complex roles materialism and conspicuous consumption play in social interactions. In general, the presented data showed 1) that materialism may influence the (monetary) outcome of transactions between buyers and sellers (essay 1), 2) that materialism may affect the way men perceive signals communicated by women's (conspicuous) consumption behavior and consequently affect interactions between men and women (essay 2), and 3) that materialism influences the strategy men follow to attract female partners (conspicuous consumption; essay 3b). Essay 3a provided additional evidence for the importance of conspicuous consumption in the human mating game by showing that hormonal fluctuations related to women's menstrual cycle may render them more or less attentive to status products.

In the following chapter, I will further discuss the findings of these essays, their interrelations and implications, as well as a number of challenges for future research.

Materialism, loss aversion, and the endowment effect

People generally ask more money to give up an object in their possession than they are willing to pay to obtain this object (Thaler, 1980). It is widely assumed that this endowment effect can be attributed to the principle of loss aversion (Kahneman & Tversky, 1979). However, the same loss is not as aversive for everyone at any time. Previous research has identified a number of moderators of the endowment effect (e.g. Loewenstein & Issacharoff, 1994; Liberman et al, 1999; Lin, Chuang, Kao and Kung, 2005; Strahilivitz & Loewnstein, 1998). Essay 1 extended this line of research by investigating the possibility of materialism as an additional moderator.

In three experiments, essay 1 showed that materialistic individuals (as compared with individuals scoring low on materialism) display a larger endowment effect. Study one suggested that materialistic sellers demand higher minimum prices for a coffee mug than less materialistic sellers. For buyers, no significant relationship between buying prices and materialism was found. Study two replicated these findings with more attractive and valuable objects.

In study three we experimentally increased the importance attached to material values through a mortality salience procedure (Kasser & Sheldon, 2000; Mandel & Heine, 1999). We expected to find an increased endowment effect after a mortality salience induction. In addition, we predicted that this increase would be more pronounced for consumers who scored higher on materialism prior to the

induction of death related thoughts. A significant three-way interaction between Endowment Condition (seller vs. buyer), Materialism, and Mortality Salience Condition (salient vs. not salient) confirmed our hypotheses. As in studies 1 and 2, no relationship between materialism and buying prices was found.

Money versus object

Despite the insights this essay offers, which are discussed extensively in the discussion section of essay 1, two issues may particularly benefit from additional research. First, it is unclear which element of the transaction guides materialists' pricing decisions: the object itself, the money involved in the transaction, or a combination of both. Throughout essay 1 we assumed that materialists demand higher selling prices because they are more attached to the objects they are endowed with. However, we cannot rule out an alternative explanation, namely that materialists may want to make more profit out of the transaction and therefore ask higher selling prices. This idea has been proposed by Brown (2005), who suggested that individuals in a seller role mainly seek to make a good deal out of the transaction (instead of being loss averse).

Although further research is warranted, data I collected but did not report in essay 1 could provide some preliminary insight in this matter. In this study, ninety-two high school students (24 boys; M_{age} = 17) were randomly distributed over two conditions. Half of them were exposed to four advertisements for luxury products. The other half of the participants served as control condition and was not exposed to any luxury-appeals. After the manipulation, participants completed the Material Values Scale (Richins & Dawson, 1992). In the meantime, a coffee mug was passed on from one student to the other. Participants were first instructed to imagine they could buy the mug. After a number of unrelated tasks, they were then asked to imagine that they actually possessed the mug and could sell it to someone else[7].

If materialistic individuals, more than people scoring low on materialism, are mainly concerned about making profit or about the money involved in the transaction, we could expect that exposure to advertisements for highly luxurious and attractive products may increase their desire for money even more. Hence, we expect to find that materialistic individuals, rather than individuals scoring low on materialism, would demand higher prices for their coffee mug in the advertising condition (compared to the control condition) and possibly also would be willing to pay less for the relatively unattractive mug. However, the manipulation produced a very similar outcome for individuals scoring low and high on materialism. All participants dropped their buying prices with approximately 40 cents, while selling prices increased with

[7] *The order of questions was based on Galin et al. (2006) who argue that the endowment effect is reinforced in a within-subject design when the buying role precedes the selling role because there is more to lose if one imagines buying an object before selling it again.*

approximately 20 cents in the advertising condition compared to the control condition. Although very preliminary and open to alternative explanations (for instance floor- or ceiling effects with respect to materialists' buying and selling prices), these data suggest that the moderating effect of materialism in the occurrence of the endowment effect is unlikely to be uniquely driven by an increased desire to make profit out of a transaction.

Materialism vs. loss-aversion

A second issue raised by the findings of essay 1 pertains to the question whether materialism moderates loss aversion or whether materialism *rather than* loss aversion explains the endowment effect. If the assumption that the effect of materialism on selling prices is not uniquely driven by a desire to make profit (cf. previous section) would be confirmed, one could easily assume that materialism in fact moderates loss aversion (i.e., materialistic individuals are more strongly attached to endowments and therefore find it harder to part from their possessions than non-materialists). However, our studies did not explicitly measure loss aversion and thus cannot convincingly confirm this hypothesis. In fact, in much research to date, evidence for the endowment effect is considered to be evidence for the existence of loss aversion, while only few studies have measured loss aversion in a way that is different from the endowment effect (examples: Booij & van de Kuilen, 2009; Novemsky & Kahneman, 2005).

Possibly as a result of this ambiguity in literature, a number of papers suggested that phenomena other than loss aversion could account for the WTP-WTA gap. One paper challenges the loss aversion explanation by explicitly disentangling the role of buyer/seller from the role of non-owner/owner (Morewedge, Shu, Gilbert, & Wilson, 2009). As such, the authors show that it is a person's ownership of a good that creates the pricing discrepancy of the endowment effect, rather than the loss of the good. For instance, in their experiments, *sellers* and *buyers* functioned as brokers for other participants in the sense that they stated a desired selling or buying price for someone else. Participants were either owners of a copy of the good themselves or not. In these experimental conditions, participants did not have to fear losing their object as they sold someone else's object. Still, prices were higher when participants owned a copy of the good themselves. These findings suggest that loss aversion may not be the only possible explanation for the endowment effect. In a different paper (Johnson, Häubl, & Keinan, 2007), it is shown that the endowment effect can be explained as the result of memory processes in which different aspects of the object and the money involved in the transaction are recalled by sellers and buyers.

In search for alternative explanations of the endowment effect it would be valuable to explore to what extent a minimum level of materialism constitutes a necessary prerequisite for the endowment effect

to occur. Even in the case of the findings of Morewedge et al. (2009) one could argue that material values will have a stronger influence when selling own possessions, rather than someone else's possessions. Indeed, materialistic individuals may lack the empathy (Sheldon & Kasser, 1995) necessary to take into account that others are equally strongly attached to their possessions and therefore would also prefer to sell their endowment for a higher price than the buying price.

One way to verify whether the effect of materialism on the WTA-WTP disparity is due to materialism's impact on loss aversion or due to properties inherent to a material value orientation, would be to set up a study in which loss aversion is explicitly measured with a different measure than the endowment effect (for instance with the elicitation method proposed by Abdellaoui, Bleichrodt, and l'Haridon (2008)). If it can be shown that this measure of loss aversion cannot explain the effect of materialism on the WTP-WTA discrepancy, this would suggest that the effect of materialism on selling prices is not simply due to a steeper value function for losses than for gains in materialists compared to non-materialists.

Irrespective whether materialism moderates loss aversion or explains the endowment effect better than loss aversion, an important next step should be to identify the specific mechanism which causes materialism to produce these effects. After all, tallying up moderators is useful, but once one has identified a moderator, it is becomes interesting to figure *why* it moderates an effect and what that says about the causes of this phenomenon. Study 2 of essay 1 ruled out two potential explanations for the observed relation between materialism and the endowment effect. Specifically, the impact of materialism on selling prices could not be attributed to an increased desirability of endowments in materialistic sellers, or to differences in affect between more and less materialistic participants. This supported our prediction that the effects found in our studies were due to properties of a material value orientation, rather than to a third variable which mediated the relation between materialism and the endowment effect.

Still, although it seems obvious to assume that materialists are more strongly attached to possessions than non-materialists, especially given the way materialism is defined and measured in our studies, it is not exactly clear why materialism produced the documented effects. After all, the ambiguity with respect to attachment to products versus making profit addressed earlier would not exist if it would be entirely clear why materialism moderates the endowment effect.

The endowment effect and evolution

A possible mechanism, apart from a desire to make profit or an increased attachment (which should be translated in an increase in loss aversion), that I find particularly interesting to explore is of

evolutionary nature. Research with different species of monkeys (Chimpanzees; Brosnan et al., 2007, and capuchin monkeys; Lakshminaryanan, Chen, & Santos, 2008) has found the intriguing result that primates, which are only ancestrally related to humans, display a very similar endowment effect. For instance, capuchin monkeys require a higher compensation (in the form of additional portions of oatmeal) for giving up one food item (e.g., pieces of apple) to obtain another food item (e.g., cereal), than would be predicted based on their previously established indifference with respect to both food items (Lakshminaryanan, Chen, & Santos, 2008).

This finding has motivated authors to suggest that seemingly irrational behavior (when regarded from an economic perspective) such as loss aversion or the endowment effect may have served an evolutionary adaptive function (Brosnan et al., 2007; Lakshminaryanan, Chen, & Santos, 2008; Li, Kenrick, Griskevicius, & Neuberg, 2011). For instance, Chimpanzees displayed a larger endowment effect when the endowment was a food item, as compared with a non-food item (Brosnan et al., 2007). Indeed, in the light of survival it may be a safer strategy to eat an owned food product instead of trading it for another product with uncertain origin and which is not yet in one's possession.

If the endowment effect, indeed, has served an adaptive function in our evolutionary past and given that materialistic individuals show this bias to a stronger extent than individuals who do not endorse a material value orientation, would this then also mean that materialism is an evolutionary adaptive trait? I will come back to this question after the discussion of essays 2, 3a, and 3b in the next section, as these essays provide additional insights in favor of this proposition.

About materialism, intersexual selection, and intrasexual competition

"Some boys kiss me, some boys hug me - I think they're O.K.
If they don't give me proper credit - I just walk away"
— Madonna. Material Girl

Although essays 2, 3a, and 3b are presented as separate manuscripts, combined they paint an interesting picture about human mating strategies and mate preferences, and the specific role materialism and materialistic consumption (such as conspicuous consumption) may play in this context.

The starting point for all three essays was the finding that men who wish to attract a female sexual partner are likely to emphasize their status, for instance by engaging in conspicuous consumption behavior (Griskevicius et al., 2007; Sundie et al., 2011). Essay 3b qualified this finding by showing that signaling status

through consumption is a mate attraction strategy that is pursued mainly by materialistic men. To some extent, this finding may explain the results of essay 2 which showed that materialistic men, rather than men scoring low on materialism, tend to react stronger and more negatively to a female interaction partner who engages in conspicuous consumption behavior. After all, if materialistic men are more inclined to rely on their possessions to compete with each other for women's attention and sexual interest, it seems to follow logically that women's conspicuous consumption may specifically influence these men's perceptions of the effectiveness of their mating efforts. Finally, the results of essay 3a suggest that (materialistic) men's conspicuous consumption may attract women's attention during specific periods in their menstrual cycle when chances of conception are highest (i.e., around ovulation).

While we put men in a mating mindset in essay 3b, in essays 2 and 3a we did not explicitly activate participants' mating goals. Specifically, in essay 3a, we assumed that hormonal fluctuations across the menstrual cycle would lead to a stronger activation of women's mate selection goal around ovulation. Also in the studies presented in essay 2 we did not explicitly activate male participants' mating goals. Still, we found effects of materialism on the interaction between men and women which can be meaningfully explained through an evolutionary psychological framework. This suggests that strategies or preferences adaptive in the domain of human mating may exert a more generalized influence on perceptions or behavior in day-to-day situations which are not immediately oriented towards mating or reproduction (see also Maner, DeWall, & Gaillot, 2008; Maner, Gailliot, & DeWall, 2007). Specifically, the flow of female sex hormones may guide women's attention toward specific products, even when they are not clearly owned by male prospects (as was the case in study 1 in essay 3a), and opposite-sex interactions may be influenced by cues related to (men's) sexual strategies, even though the interaction itself is by no means explicitly intended to have a sexual outcome.

Prior research by Maner, Gailliot, and DeWall (2007) has additionally shown that sexually unrestricted individuals' perception is most strongly biased by evolved mate preferences. Specifically, they showed that in particular sexually unrestricted participants were more likely to fixate on attractive members of the opposite sex than their sexually committed counterparts. Consistently, in essay 3b, we found that materialistic men tended to have a more unrestricted sociosexual orientation (at least in terms of their attitudes). In essay 2 we showed that these men are most sensitive to women's conspicuous consumption. So, also in our studies we found evidence that those men who tend to have a more positive attitude towards unrestricted sexual relations, are the ones for whom mating related strategies may affect day-to-day social interactions most.

Conspicuous consumption: Why do women do it?

Based on the finding that women's conspicuous consumption might negatively affect social interactions with (materialistic) men, one might question *why* women engage in status-signaling behavior. From previous research we learn that women are not likely to engage in conspicuous consumption behavior to increase their own attractiveness to men (Sundie et al., 2011), which also appeared from the data presented in essay 3a. In fact, ovulating women, who tend to put much effort in appearing attractive and sexy to attract male partners (Durante et al., 2011; Haselton et al., 2007; Hill & Durante, 2009), were shown to engage *less* in conspicuous consumption behavior.

However, there might be other reasons for women to engage in status-signaling behavior. For instance, the consumption of status products clearly has some hedonic value and expensive products may be desirable for their perceived quality (Eastman, Goldsmith, & Flynn, 1999; Vigneron & Johnson, 2004). If these motivations drive women's conspicuous consumption behavior, the effects for social interactions documented in essay 2 may be interpreted as unintended by-products of this behavior. However, possibly–and more interestingly–women's status consumption may also fulfill a more strategic function.

Interesting in this respect is the metaphor of the marketplace Baumeister and Vohs (2004) used to describe the mating game of heterosexual humans. Specifically, because mating has a relatively high cost for women (Buss, 2004), not in the least because of the limited number of offspring they are able to produce (Chapman, Arnqvist, Bangham, & Rowe, 2003; Trivers, 1972), these authors compared women with *sellers* (of sex) and men with *buyers* (buying sex in exchange for resources). Drawing upon this metaphor and the insights of essay 1, one could postulate that women who surround themselves with status-signaling products (which may be considered as a form of materialistic behavior) basically communicate that their minimum selling prices for sex is higher compared to the selling price of women who do not engage in such behavior[8].

Possibly, women use conspicuous consumption as a strategy to *increase competition* among male prospects in order to be able to mate with the fittest male who carries genes of high quality, and who is able to provide most resources for their offspring. However, the results of essay 2 suggest that women's conspicuous consumption behavior is only interpreted as a signal of high required male mate value by materialistic men, not by men scoring low on materialism. In other words, this strategy would seem to work only for certain types of men. These materialistic men, in turn, appear to be turned off by women's

[8] *At least, the findings of essay 2 suggest that the 'buyers' (in this case men) perceive women's conspicuous consumption behavior that way, especially when they are materialistic.*

conspicuous consumption, which may not be beneficial if the aim of women's consumption behavior is to increase competition among men.

However, a limitation of essay 2 pertains to the fact that we did not create opportunities for men to compete with each other. Hence, future research may need to take competition into account when studying the influence of women's conspicuous consumption on male behavior. In the absence of competition (as was the case in our studies) women's conspicuous consumption may demotivate materialistic men. However, when potential rivals are present, materialistic men may possibly be motivated by women's conspicuous consumption to raise their competitive efforts. After all, materialistic individuals tend to be competitive, rather than cooperative (Sheldon & McGregor, 2000; Sheldon, Sheldon, & Osbaldistan, 2000), they are strongly concerned about their position relative to others (Chan & Prendergast, 2007), and they have a tendency to strive for status and prestige (Richins, 1994a, 1994b; Wong & Ahuvia, 1998), which can only be reached if one outperforms others. Putting (visible) effort in trying to attract a mate with high (financial) standards could be a way to achieve this goal.

Apart from creating competition among men, women's conspicuous consumption may also be aimed at screening prospective mates for *fakers*. Although conspicuous consumption once used to be a fairly honest indicator of status and resources (cf. Veblen, 1899), we argued in essay 3a that this assumption may no longer hold. After all, the possibility to incur debt has given men without resources or good genes access to status products (Gallup & Frederick, 2010). So, given that the honesty of signals of wealth and status through consumption cannot be directly assessed (Buss, 2004), it is possible that women put prospective partners to the test by elevating their own level of conspicuous consumption. Only men who feel sufficiently confident about their own mate value may continue to put effort in attracting this particular woman.

In addition, it would make sense that women would particularly screen out materialistic men with this strategy. After all, for a number of reasons materialistic men may not the most desirable mating partners. For instance, materialistic individuals are less interested in building satisfying social relationships (e.g., Richins & Dawson, 1992), as was argued in the introduction of essay 2, they are more selfish, narcissistic, and show less empathy (e.g., Rose, 2007; Sheldon & Kasser, 2005), and, according to the findings of essay 3b, materialistic men are also less likely to invest in caring, long-term relationships. In fact, they may even consider their partner as a tool to achieve personal success (cf. essay 3B). In addition, materialists tend to suffer from a wide range of uncertainties, such as lower self-esteem or a past of economic uncertainty (for a review, see Kasser et al., 2004).

Although these assumptions with respect to women's motivation to engage in conspicuous consumption behavior require further testing, an interesting result in this context was found in essay 3a (study 2). If our reasoning holds, one would expect that ovulating women will benefit most from screening

out undesirable mating partners. As such, one would expect that women's intentions to engage in conspicuous consumption behavior would be highest around ovulation, compared to other phases of the menstrual cycle. However, the findings of our study reveal an opposite pattern. Namely, we found that conspicuous consumption *decreases* at peak-fertility. Two explanations for these findings may be worth investigating further.

First, in general, women's short-term mating goals are more strongly activated around ovulation that during other phases of her menstrual cycle (Buss, 2004; Gangestad, Garver-Apgar, Simpson, & Cousins, 2007). Hence, at this moment in the menstrual cycle, women may be less concerned about attracting a mating partner who is not willing to invest in a long-term relationship as long as he offers genetic benefits to her offspring (cf. Gangestad, Garver-Apgar, Simpson, & Cousins, 2007). Given the fact that essay 3a suggests that women seem to have evolved an attention bias toward status products around ovulation and the fact that men's conspicuous consumption may be more of a signal of genetic quality than of caretaking abilities (long-term), we may expect that ovulating women decrease their own status consumption; at least to the extent that they consciously or unconsciously realize that their own conspicuous consumption discourages men who, themselves, tend to engage in conspicuous consumption as a mate attraction strategy (cf. essays 2 and 3b).

Second, both men and women rely on complex calibration mechanisms to assess their own and others' mate value (Bailey, Durante, & Geary, 2011), as was explained in more detail in essay 2. Hence, it may not be beneficial for individuals of both sexes to impose excessively high standards on prospective partners if one's own perceived mate value is not sufficiently high as well. After all, this increases the risk of being left behind with nothing. This would be especially problematic around ovulation, when the female body is prepared for reproduction. In addition, prior research has found that a woman's self-esteem drops around ovulation, possibly as the result of an adaptive strategy of the female body to motivate her to improve her attractiveness to raise interest of potential mates (Hill & Durante, 2009). Although not tested, this drop in self-esteem may decrease women's perceived mate value. As a result, ovulating women may also reduce their own conspicuous consumption. The reverse reasoning could be worth testing as well. Female engagement in conspicuous consumption may increase with increasing levels of physical attractiveness. Indeed, the more mate value a women can offer, the higher the "price" she can demand for her sex (Baumeister & Vohs, 2004).

While these assumptions about the purpose of women's conspicuous consumption may seem plausible from a theoretical perspective, they require extensive further testing before conclusions can be drawn. For now, the results of the studies presented in my essays suggest that there are ample possibilities for women to, either consciously or unconsciously, engage in conspicuous consumption behavior for strategic purposes.

Who are individuals scoring low on materialism?

While my essays, like most papers on materialism, primarily focused on materialistic individuals, they also provide useful information about individuals scoring *low on materialism*. For instance, essay 3b provided some evidence that men scoring low on materialism prefer *not* to be associated with conspicuous goods.

In general, people tend to hold negative stereotypes, such as selfishness or insecurity, of individuals who are associated with typical materialistic purchases (Van Boven, Campbell, & Gilovich, 2010). Indeed, in essay 3a we argued that conspicuous consumption may be perceived as a disguise for problematic characteristics, such as low self-esteem, powerlessness (Rucker & Galinsky, 2008, 2009; Sivanathan & Pettit, 2010), or a lack of commitment (Sundie et al., 2011; cf. also essay 3b). Depending on a person's level of materialism, s/he may be more inclined to perceive status-signaling consumption as being more or less positive. Specifically, a low score on a materialism scale may reflect a negative image of or more stereotypical thinking about materialistic individuals.

In fact, preliminary support for this assumption was found in a number of my experiments which are not included in the essays of this dissertation. These studies showed that that in same-sex interactions, individuals scoring low on materialism tend to react strongest (and most negatively) to an interaction partner's conspicuous consumption behavior. For instance, one study involved the same scenario as the scenario used in study 2 of essay 2. The only difference was that the interaction partner was described as having the same sex as the participant. After reading the scenario, fifty-seven participants (M_{age} = 22.00; 25 males) received a paper version of the drawing of the interaction situation (cf. appendix 2). They were instructed to glue a stick figure representing them on the paper and to draw a smile on the face of their figure. Participants scoring low (compared to high) on materialism, tended to draw a more unfriendly face (smaller smile) in the conspicuous consumption condition, compared to the non-conspicuous consumption condition. In another study, fifty-two participants, (M_{age} = 21.51; 26 males) were instructed to draw a person who was either described as engaging in conspicuous consumption behavior or not. Based on their drawings, participants scoring low on materialism were judged (by independent judges who were blind to the experimental conditions) to hold more negative opinions of the described person when s/he was described to engage in conspicuous consumption behavior, compared to when s/he was not. No such effects were found for materialistic participants.

So, an interesting, yet often overlooked opportunity for further research is to explore in more detail what it means when individuals report to be *not materialistic*. A low score on a materialism scale may be an indicator of more than simply the absence of a material value orientation. It may, for instance, also imply a more negative attitude towards materialistic individuals. In this case also a low endorsement of material

values may produce important and meaningful results for the course of social interactions, for the well-being of materialistic individuals (cf. also Van Boven, Campbell, & Gilovich, 2010), or for people's perceptions of conspicuous consumption behavior.

Materialism: An evolutionary adaptive mechanism?

Although the findings of essays 2, 3a, and 3b raise more questions than they are able to answer, all together they seem to support the proposition that materialism could be considered as an evolutionary adaptive trait (see also end of previous section). Specifically, in men, materialism produces a tendency to display a characteristic (status) through the consumption of products (essay 3b) which may give them a reproductive advantage, especially given the attention women pay to status products during ovulation (essay 3a). In women, materialism (and related conspicuous consumption behavior) may lead to the attraction of better partners, although the cost related to this behavior may be considerable (cf. essay 2).

Throughout evolution, material objects have fulfilled adaptive functions in many different ways. For instance, evidence of status signaling consumption–which is an essential element of materialism (cf. Richins & Dawson, 1992)–has been found in numerous societies across our historical past (Veblen, 1899; Bliege Bird & Smith, 2005; Godoy et al., 2007). Signaling status has important consequences for one's access to resources and for (men's) reproduction (Buss, 2004; Keltner, Gruenfeld & Anderson, 2003). At a very basic level, food products are directly necessary for survival. Wood, bricks, fabrics, and other materials are valuable in providing shelter from severe weather conditions or external threats, or can be used as weapons or tools which may serve some evolutionary meaningful function. Hence, it seems plausible to assume that the development of a value system which emphasizes the importance of possessions may–at least to some extent–have served an adaptive function. In other words, a certain level of attachment to possessions, and thus a certain level of materialism, may have helped our ancestors in solving diverse adaptive problems.

Still, much research investigating and showing the negative consequences of materialism, both for the individual's well-being as well as for the well-being of the human species in general, suggests that the development and spread of a material value orientation may produce more problematic outcomes than beneficial ones. This research, for instance, suggests that materialism is mainly problematic insofar it interferes with other, more intrinsically satisfying values or behavior, such as religious beliefs or community feelings (Burroughs & Rindfleisch, 2002; Kasser, 2002; Sheldon & Kasser, 2008), or (pro)social behavior (e.g., Vohs, Mead, & Goode, 2006; 2008). This does not preclude, however, that people may have multiple

motives (e.g., concerning the acquisition of possessions), which may be adaptive or beneficial in different situations, but may also conflict with each other when being pursued simultaneously.

In addition, earlier theorizing has suggested that materialism, conceptualized as happiness-seeking through consumption and acquisition, is a phenomenon that has begun to emerge at a dramatic speed across countries en cultures only some centuries ago (for an overview, see Belk, 1985) because industrial (r)evolutions have made large-scale consumption attainable to the masses (Mason, 1981). Still, throughout our historical past, a more basic attachment to possessions may have been an adaptive value. Yet, depending on changes in the societal context or the physical environment in which we live, certain evolved adaptations may have lost some of their importance (Buss, 2004). Possibly, in contemporary industrialized societies, in which a huge array of products has become easily accessible to most people, it may have become more adaptive to *not* endorse a material value orientation. In addition, it could very well be that a general attachment to products, still, is an adaptive trait, yet the more extreme belief that these products are essential to achieve status or happiness may be less adaptive.

While this reasoning is still speculative and not yet carefully theoretically grounded, I believe it would be an interesting challenge for future research to shed more light on the ways in which materialism is more and less problematic, and to try to develop a more complete understanding of the origins of materialism. When doing so, I also believe it would be useful for future materialism researchers to consider a number of issues with respect to the definition of materialism. These issues will be addressed in the next and final section.

Some closing thoughts about the definition of materialism

In the early days of materialism research within the fields of psychology and consumer behavior, attention has been devoted to defining the construct of materialism. Since then, materialism has been defined in a number of ways, such as in terms of related personality traits (Belk, 1985), in terms of underlying beliefs about the acquisition of products (Richins & Dawson, 1992), or in terms of its extrinsic nature (e.g., Kasser, 2002; Sheldon & Kasser, 2008). Hence, although this manuscript followed the definition of materialism of Richins and Dawson (1992) to be consistent with most recent consumer behavior, it is important to recognize that this definition is not the only or necessarily the best possible conceptualization.

When defined in its most narrow sense, one could consider materialism as a strong attachment to material possessions (cf. the *acquisition centrality* dimension of the Material Values Scale of Richins and Dawson (1992)). This does not necessary imply any negative consequences and does not say anything

about the underlying reasons for this attachment. When being regarded from this narrow perspective, it is not so hard to see how materialism may produce positive outcomes, for instance for survival or reproduction. As I hypothesized in the previous chapter, products may benefit survival because they may give shelter or protection, or because they may rescue us from starvation. With respect to reproduction, the current essays show, for instance, how the possession of status products may give men a reproductive advantage.

However, in most research, materialism is conceived as a negative or problematic concept (Belk, 1985). Very often, this view or assumptions about the motivations driving individuals' attachment to products are included in the definition of the construct. For instance, Belk (1984, 1985) defined materialism in terms of the negative personality traits of non-generosity, envy, and possessiveness. In addition, the two remaining dimensions of materialism according to Richins and Dawson (1992), namely *acquisition as the pursuit of happiness* and *possession-defined success*, capture specific motivations underlying the desire to own possessions (e.g., a motivation to increase happiness through acquisition and a motivation to signal status through possessions).

In addition, by far most research using the Material Values Scale combines all three dimensions into a composite scale, although there is some research that shows differential relations across the three dimensions. For example, Ahuvia and Wong (2002) found that *acquisition as the pursuit of happiness* was negatively correlated with two measures of life satisfaction but *possession-defined success* was unrelated to either. Roberts, Tanner, & Manolis (2005) found that *acquisition as the pursuit of happiness* was related to family structure (more materialism for respondents from divorced vs. intact families) and family stress (higher materialism for those reporting higher levels of family stress) but *possession-defined success* and *acquisition centrality* were not.

Also in some of my own research (studies not reported in the current essays) I find evidence that different dimensions of the Material Values Scale (and thus different aspects of materialism) may be related to different underlying motivations. In these studies we propose and find that the *possession-defined success* is related to a motivation to get ahead (desire for a greater relative advantage in a dictator game and a positional choice task), to preferences for products that make people stand out above others (expensive and distinct), and an interest in conspicuous consumption. In contrast, *acquisition as the pursuit of happiness* appears to be related to preferences for more equal and egalitarian positions in a dictator game and a positional choice task, preferences for products that are more conforming (inexpensive and popular), and lesser preferences for products that make people stand out from others (expensive and distinct).

These observations show that most definitions of materialism and the scales developed to measure the construct based on these definitions, such as the Material Values Scale of Richins and Dawson (1992),

tend to capture more than purely individuals' attachment to possessions. Specifically, the Material Values Scale seems to capture an attachment to certain products (status products) more than to other products and the scale items reflect specific assumptions about different motivations driving a desire for products.

Although this approach has yielded interesting results–after all, the existing scales meaningfully correlate with highly important variables and many papers using materialism scales continue to be published–its flipside is that it may become increasingly confusing what each scale is actually measuring, and by extension what materialism really is. For instance, is it the general attachment to products that matters? Or is it an underlying motivation, such as a desire to compensate feelings of unhappiness or a general concern with status which facilitates the adoption of materialistic beliefs, which drives the documented materialism-effects? For instance, the materialism-effects described in essay 3b seem to be driven mainly by the *possession-defined success* subscale of the Material Values Scale. Possibly, the behavior or underlying motivations of men scoring high on success materialism (but not necessarily on other dimensions of materialism), may facilitate them at being sexually unrestricted. For instance, those materialists who are more concerned about their status and who also tend to objectify their partners more (cf. essay 3b, study 3) will engage more in conspicuous consumption behavior, which is recognized as a signal of sexual unrestrictedness (Sundie et al., 2011), and may find it less important to invest in long-term committed relationships. One could question, however, to what extent this is an effect of "materialism". In addition, if materialism would be studied from a more nuanced perspective (for instance from the perspective of its related, yet distinct dimensions such as in the previous example), it may be easier to explain why materialism is related to certain variables, such as a more positive attitude toward unrestricted sexual encounters (cf. essay 3b).

So, although this dissertation did not intend to develop a new or more integrative definition of materialism, I tend to believe that this could be a valuable thing to do in future research. I hope that this manuscript could convince its reader that future materialism research could benefit from refining our knowledge about the implications of an attachment to possessions, as well as about different motivations, beliefs, or perhaps evolutionary processes which may underlie this attachment.

REFERENCES

Abdellaoui, M., Bleichrodt, H., & l'Haridon, O. (2008). A tractable method to measure utility and loss aversion under prospect theory. *Journal of Risk and Uncertainty, 36* (3), 245-266.

Ahuvia, A., & Wong, N. Y. (2002). Personality and values based materialism: Their relationship and origins. *Journal of Consumer Psychology*, *12* (4), 389–402.

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.

Andersen, J. F., Andersen, P. A., & Jensen, A. D. (1979). The measurement of nonverbal immediacy. *Journal of Applied Communication Research, 7* (2), 153-180.

Andersen, P. A., Guerrero, L. K., Buller, D. B., & Jorgensen, P. F. (1998). An empirical comparison of three theories of nonverbal immediacy exchange. *Human Communication Research, 24* (4), 501-535.

Anderson, U. S., Perea, E. F., Becker, D. V., Ackerman, J. M., Shapiro, J. R., Neuberg, S. L., & Kenrick, D. T. (2010). I only have eyes for you: Ovulation redirects attention (but not memory) to attractive men. *Journal of Experimental Social Psychology, 46* (5), 804-808.

Ariely, D., Huber J., & Wertenbroch, K. (2005). When do losses loom larger than gains? *Journal of Marketing Research*, *42* (2), 134-138.

Arndt, J., Solomon, S., Kasser, T., & Sheldon, K. M. (2004). The urge to splurge: A terror management account of materialism and consumer behavior. *Journal of Consumer Psychology*, *14* (3), 198-212.

Bailey, D. H., Durante, K., & Geary, D. C. (2011). Men's perception of women's attractiveness is calibrated to relative mate value and dominance of the women's partner. *Evolution and Human Behavior, 32* (2), 138-146.

Bateman, I., Munro, A., Rhodes, B., Starmer, C., & Sugden, R. (1997). A test of the theory of reference-dependent preferences. *Quarterly Journal of Economics*, *112* (2), 479-505.

Baumeister, R. F., & Vohs, K. (2004). Sexual economics: Sex as female resource for social exchange in heterosexual interactions. *Personality and Social Psychology Review, 8* (4), 339-363.

Belk, R. W. (1984). Three scales to measure constructs related to materialism: Reliability, validity, and relationships to measures of happiness, In T. Kinnear (Ed.), *Advances in Consumer Research Volume 11* (pp.291-297). Provo, UT: Association for Consumer Research.

Belk, R. W. (1985). Materialism: Trait aspects of living in the material World, *Journal of Consumer Research, 12* (3), 265-280.

Belk, R. W. (1988). Possessions and the extended self. *Journal of Consumer Research, 15* (2), 139-168.

Belk, R. W., Bahn, K. D., & Mayer, R. N. (1982). Developmental recognition of consumption symbolism. *Journal of Consumer Research, 9* (1), 4-17.

Bischoff, I., & Meckl, J. (2008). Endowment effect theory, public goods and welfare. *The Journal of Socio-Economics*, *37* (5), 1768-1774.

Bjorklund, D. F., & Shackelford, T. K. (1999). Differences in parental investment contribute to important differences between men and women. *Current Directions in Psychological Science*, *8* (3), 86-89.

Bliege Bird, R., & Smith, E. A. (2005). Signaling theory, strategic interaction, and symbolic capital. *Current Anthropology, 46 (*2), 221-248.

Booij, A. S., & van de Kuilen, G. (2009). A parameter-free analysis of the utility of money for the general population under prospect theory. *Journal of Economic Psychology, 30* (4), 651-666.

Briers, B., Pandelaere, M., Dewitte, S., & Warlop, L. (2006). Hungry for money. The desire for caloric resources increases the desire for financial resources and vice versa. *Psychological Science, 17* (11), 939-943.

Brosnan, S. F., Jones, O. D., Lambeth, S. P., Mareno, M. C., Richardson, A. S., & Schapiro, S. J. (2007). Endowment effects in Chimpanzees. *Current Biology, 17* (19), 1-4.

Brown, K. W., & Kasser, T. (2005). Are psychological and ecological well-being compatible? The role of values, mindfulness, and lifestyle. *Social Indicators Research*, *74* (2), 349-368.

Brown, T. C. (2005). Loss aversion without the endowment effect, and other explanations for the WTA-WTP disparity. *Journal of Economic Behavior and Organization, 57* (3), 367-379.

Bruner, J. S. (1957). On perceptual readiness. *Psychological Review, 64* (2), 123-152.

Buijzen, M., & Valkenburg, P. M. (2003). The unintended effects of television advertising: A parent-child survey. *Communication Research, 30* (5), 483-503.

Burroughs, J. E., & Rindfleisch, A. (2002). Materialism and well-being: A conflicting values perspective. *Journal of Consumer Research, 29* (3), 348-370.

Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences*, *12*, 1-49.

Buss, D. M. (2004). *Evolutionary psychology: The new science of the mind (4th edition)*. Boston: Allyn & Bacon.

Buss, D. M., & Schmitt, D. P. (1993). Sexual strategies theory: An evolutionary perspective on human mating. *Psychological Review*, *100* (2), 204-232.

Carmon Z., Wertenbroch, K., & Zeelenberg, M. (2003). Option attachment: When deliberating makes choosing feel like losing. *Journal of Consumer Research*, *30* (1), 15–29.

Carmon, Z., & Ariely, D. (2000). Focusing on the forgone: Why value can appear so different to buyers and sellers. *Journal of Consumer Research*, *27* (3), 360-370.

Chan, K., & Prendegast, G. (2007). Materialism and social comparison among adolescents. *Social Behavior and Personality, 35* (2), 213-228.

Chang, L., & Arkin, R. M. (2002). Materialism as an attempt to cope with uncertainty. *Psychology & Marketing, 19* (5), 389-406.

Chaplin, L. N. & John, D. R. (2007). Growing up in a material world: Age differences in materialism in children and adolescents. *Journal of Consumer Research*, *34* (4), 480-493.

Chaplin, L. N., & John, D. R. (2010). Interpersonal influences on adolescent materialism: A new look at the role of parents and peers. *Journal of Consumer Psychology, 20*, 176-184.

Chapman, T., Arnqvist, G., Bangham, J., & Rowe, L. (2003). Sexual conflict*. Trends in Ecology and evolution, 18* (1), 41-47.

Christpher, A. N., Drummond, K., Jones, J. R., Marek, P., & Therriault, K. M. (2006). Beliefs about one's own death, personal insecurity, and materialism. *Personality and Individuals Differences, 40* (3), 441-451.

Clump, M. A., Brandel, J. M., & Sharpe, P. J. (2002). Differences in environmental responsibly between materialistic groups. *Psychologia: An International Journal of Psychology in the Orient, 45* (3), 155-161.

Colarelli, S. M., & Dettmann, J. R. (2003). Intuitive evolutionary perspectives in marketing practices. *Psychology and Marketing*, *20* (9), 837-865.

Darwin, C. R. (1859). *On the origin of species by means of natural selection, or the preservation of favoured races in the struggle for life*. John Murray: London.

Darwin, C. R. (1871). *The descent of man and selection in relation to sex*. John Murray: London.

De Fraja, G. (2009). The origin of utility: Sexual selection and conspicuous consumption. *Journal of Economic Behavior and Organization, 72* (1), 51-69.

DeWall, C. N., & Maner, J. K. (2008). High status men (but not women) capture the eye of the beholder. *Evolutionary Psychology, 6* (2), 328-341.

Dittmar, H. (1991). Meanings of material possessions as reflections of identity: Gender and social-material position in society. *British Journal of Social Psychology, 6* (6), 165-186.

Dittmar, H. (2005). Compulsive buying a growing concern? An examination of gender, age, and endorsement of materialistic values as predictors. *British Journal of Psychology, 96* (4), 467-491.

Dunbar, N. E., & Burgoon, J. K. (2005). Perceptions of power and interactional dominance in interpersonal relationships. *Journal of Social and Personal Relationships, 22* (2), 207–233.

Dunn, M. J., & Searle, R. (2010). Effect of manipulated prestige-car ownership on both sex attractiveness ratings. *British Journal of Psychology, 101* (1), 69-80.

Durante, K. M., Griskevicius, V., Hill, S. E., Perilloux, C., & Li, N. P. (2011). Ovulation, female competition, and product choice: Hormonal influences on consumer behaviour. *Journal of Consumer Research*, *37* (6), 921-934.

Dynan, K. E., Skinner, J., & Zeldes, S. P. (2004). Do the rich save more? *Journal of Political Economy, 112* (2), 397-444.

Eagly, A. H., & Mladinic, A. (1989). Gender stereotypes and attitudes toward women and men. *Personality and Social Psychology Bulletin, 15* (4), 543–558.

Eastman, J. K., Goldsmith, R. E., & Flynn, L. R. (1999). Status consumption in consumer behavior: Scale development and validation. *Journal of Marketing Theory and Practice, 7* (3), 41-52.

Escalas, J. E., Bettman, J. R. (2005). Self-construal, reference groups, and brand meaning. *Journal of Consumer Research, 32* (3), 378-389.

Feinberg, D. R., Jones, B. C., Law Smith, M. J., Moore, F. R., DeBruine, L. M., Cornwell, R. E., Hillier, S. G., Perrett, D. I. (2006). Menstrual cycle, trait estrogen level and masculinity preferences in the human voice. *Hormones and Behavior*, *49* (2), 215-222.

Fennis, B. M. (2008). Branded into submission: Brand attributes and hierarchisation behavior in same-sex and mixed-sex dyads. *Journal of Applied Social Psychology, 38* (8), 1993-2009.

Fournier, S., & Richins, M. L. (1991). Some theoretical and popular notions concerning materialism. *Journal of Social Behavior and Personality, 6* (6), 403-414.

Franciosi R., Kujal, P., Michelitsch, R., Smith, V., & Deng, G. (1996). Experimental tests of the endowment effect. *Journal of Economic Behavior and Organization*, *30* (2), 213-226.

Frank, R. H. (1999). *Luxury fever: Money and happiness in an era of excess.* Princeton, NJ: Princeton University Press.

Galin, A., Gross Sigal Sapir, M., & Kela-Egozi, I. (2006). The endowment effect on academic chores trade-off (ACTO). *Theory and Decision, 60* (2), 335-357.

Gallup, G. G., & Frederick, D. A. (2010). The science of sex appeal: An evolutionary perspective. *Review of General Psychology, 14* (3), 240-250.

Gangestad, S. W., & Simpson, J. A. (2000). The evolution of human mating: Trade-offs and strategic pluralism. *Behavioral and Brain Sciences, 23*, 573-644.

Gangestad, S. W., Garver-Apgar, C. E., Simpson, J. A., & Cousins, A. J. (2007). Changes in women's mate preferences across the ovulatory cycle. *Journal of Personality and Social Psychology, 92* (1), 151-163.

Gangestad, S. W., Thornhill, R., & Garver-Apgar, C. E. (2005). Adaptations to ovulation. In D. M. Buss (Ed.), *Handbook of evolutionary psychology* (pp. 344-371). New York: Wiley.

Garver-Apgar, C. E., Gangestad, S. W., & Thornhill, R. (2008). Hormonal correlates of women's mid-cycle preference for the scent of symmetry. *Evolution and Human Behavior, 29* (4), 223-232.

Geary, D. C. (2000). Evolution and proximate expression of human paternal investment. *Psychological Bulletin*, *126* (1), 55-77.

Ger, G., & Belk, R. W. (1996). Cross-cultural differences in materialism. *Journal of Economic Psychology*, *17* (1), 55-77.

Godoy, R., Reyes-García, V., Leonard, W. R., Huanca, T., McDade, T., Vadez, V., Tanner, S. (2007). Signaling by consumption in a native Amazonian society. *Evolution and Human Behavior, 28* (2), 124-134.

Grammer, K., Renninger, L., & Fischer, B. (2004). Disco clothing, female sexual motivation, and relationship status: Is she dressed to impress? *Journal of Sex Research, 41* (1), 66-74.

Greenberg, J., Pyszczynski, T., & Solomon, S. (1986). The causes and consequences of a need for self-esteem: a terror management theory, In R. F. Baumeister (Ed.), *Public self and private self* (pp.189-207). New York: Springer-Verlag.

Griskevicius, V., Tybur, J. M., Sundie, J. M., Cialdini, R. B., Miller, G. F., & Kenrick, D. T. (2007). Blatant benevolence and conspicuous consumption: When romantic motives elicit strategic costly signals. *Journal of Personality and Social Psychology*, *93* (1), 85-102.

Hall, J. A., Coats, E. J., & Smith LeBeau, L. (2005). Noverbal behavior and the vertical dimension of social relations: A meta-analysis. *Psychological Bulletin, 131* (6), 898-924.

Han, Y. L., Nunes, J. C., & Drèze, X. (2010). Signaling status with luxury goods: The role of brand prominence. *Journal of Marketing, 74* (4), 15-30.

Haselton, M. G., & Gangestad, S. W. (2006). Conditional expression of women's desires and men's mate guarding across the ovulatory cycle. *Hormones and Behavior, 49* (4), 509-518

Haselton, M. G., & Miller, G. F. (2006). Women's fertility across the cycle increases the short-term attractiveness of creative intelligence compared to wealth. *Human Nature, 17* (1), 50-73.

Haselton, M. G., Mortezaie, M., Pillsworth, E. G., Bleske-Rechek, A., & Frederick, D. A. (2007). Ovulatory shifts in human female ornamentation: Near ovulation, women dress to impress. *Hormones and Behavior*, *51* (1), 40-45.

Helmreich, R. L., Spence, J. T., & Wilhelm, J. A. (1981). A psychometric analysis of the personal attributes questionnaire. *Sex Roles*, 7 (11), 1097-1108.

Hill, S. E., & Buss, D. M. (2008). The mere presence of opposite-sex others on judgments of sexual and romantic desirability: opposite effects for men and women. *Personality and Social Psychology Bulletin, 34* (3), 635-647.

Hill, S. E., & Durante, K. M. (2009). Do women feel worse to look their best? Testing the relationship between self-esteem and fertility status across the menstrual cycle. *Personality and Social Psychology Bulletin*, *35* (12), 1592-1601.

Huberman, B. A., Loch, C. H., & Önçuler, A. (2004). Status as a valued resource. *Social Psychology Quarterly, 67* (1), 103–114.

Ivanic, A., & Nunes, J. (2009). *Flexing one's status: How pulling rank elevates feelings of prestige.* Paper presented at the 2009 Society for Consumer Psychology Conference. San Diego, 12-14/2/2009.

Janssens, K., Pandelaere, M., Van den Bergh, B., Millet, K., Lens, I., & Roe, K. (2011). Can buy me love. Mate attraction goals lead to perceptual readiness for status products. *Journal of Experimental Social Psychology*, *47* (1), 254-258.

Johnson, E. J., Häubl, G., & Keinan, A. (2007). Aspects of endowment: A query theory of value construction. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *33* (3), 461-474.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica, 47* (2), 263-291.

Kahneman, D., Knetsch, J. L., & Thaler, R. H. (1990). Experimental tests of the endowment effect and the coase theorem. *Journal of Political Economy, 98* (6), 728-741.

Kasser, T. (2002). *The high price of materialism.* Cambridge: MIT Press.

Kasser, T., & Ahuvia, A. (2002). Materialistic values and well-being in business students. *European Journal of Social Psychology*, *32* (1), 137-146.

Kasser, T., & Kasser, V. G. (2001). The dreams of people high and low in materialism. *Journal of Economic Psychology, 22* (6), 693-719.

Kasser, T., & Ryan, R. M. (1993). A dark side of the American dream - Correlates of financial success as a central life aspiration. *Journal of Personality and Social Psychology*, *65* (2), 410-422.

Kasser, T., & Ryan, R. M. (1996). Further examining the American dream: Differential correlates of intrinsic and extrinsic goals. *Personality and Social Psychology Bulletin, 22* (March), 280-287.

Kasser, T., & Sheldon, K. M. (2000). Of wealth and death: Materialism, mortality salience, and consumption behavior. *Psychological Science, 11* (4), 348-351.

Kasser, T., Ryan, R. M., Zax, M., & Sameroff, A. J. (1995). The relations of material and social environments to late adolescents' materialistic and prosocial values. *Developmental Psychology, 31* (6), 907-914.

Kasser, T., Ryan, R. M., Couchman, C. E., & Sheldon, K. M. (2004). Materialistic values: Their causes and consequences, In T. Kasser, & A.D. Kanner (Eds.), *Psychology and consumer culture: The struggle for a good life in a materialistic world* (pp.11-28). Washington, DC: American Psychological Association.

Keltner, D., Gruenfeld, D. H., & Anderson, C. (2003). Power, approach and inhibition. *Psychological Review, 110* (2), 265–284.

Kenrick, D. T., & Keefe, R. C. (1992). Age preferences in mates reflect sex differences in human reproductive strategies. *Behavioral and Brain Sciences, 15* (1), 75-133.

Kenrick, D. T., Groth, G. E., Trost, M. R., & Sadalla, E. K. (1993). Integrating evolutionary and social exchange perspectives on relationships: Effects of gender, self-appraisal, and involvement level on mate selection criteria. *Journal of Personality and Social Psychology*, *64* (6), 951-969.

Kenrick, D. T., Sadalla, E. K., Groth, G. E., & Trost, M. R. (1990). Evolution, traits, and the stages of human courtship: Qualifying the parental investment model. *Journal of Personality*, *58* (1), 97-116.

Kleine, R. E., Kleine, S. S., & Kernan, J. B. (1993). Mundane consumption and the self: A social identity perspective. *Journal of Consumer Psychology, 2* (3)*,* 209-235.

Kruger, D. J. (2008). Male financial consumption is associated with higher mating intentions and mating success. *Evolutionary Psychology, 6* (4), 603-612.

Lakshminaryanan, V., Chen, M. K., & Santos, L. R. (2008). Endowment effect in capuchin monkeys. *Philosophical Transactions of the Royal Society B (Biology), 363* (1511), 3837–3844

Lens, I., Driesmans, K., Pandelaere, M., & Janssens, K. (2012). Would male conspicuous consumption capture the female eye? Menstrual cycle effects on women's attention to status products. *Journal of Experimental Social Psychology, 48* (1), 346-349.

Lerner, J. S., Small, D. A., & Loewenstein, G. (2004). Heart strings and purse strings: Carryover effects of emotions on economic decisions. *Psychological Science*, *15* (5), 337-341.

Levy, S. J. (1959). Symbols for sale. *Harvard Business Review, 33*, 117-124.

Li, N. P., Bailey, J. M., Kenrick, D. T., & Linsenmeier, J. A. W. (2002). The necessities and luxuries of mate preferences: Testing the tradeoffs. *Journal of Personality and Social Psychology*, *82* (6), 947-955.

Li, Y. J., Kenrick, D. T., Griskevicius, V., & Neuberg, S. L. (2011). Economic biases in evolutionary perspective: How mating and self-protection motives alter loss aversion. *Journal of Personality and Social Psychology*, DOI: 10.1037/a0025844.

Liberman, N., Idson, L. C., Camacho, C. J., & Higgins, E. T. (1999). Promotion and prevention choices between stability and change. *Journal of Personality and Social Psychology, 77* (6), 1135-1145.

Lin, C. H., Chuang, S. C., Koa, D.T., & Kung, C. Y. (2006). The role of emotions in the endowment effect. *Journal of Economic psychology*, *27* (4)*,* 589-597.

Littell, R. C., Milliken, G. A., Stroup, W. W., Wolfinger, R. D., & Schabenberger, O. (2006). *SAS for mixed models*, 2nd ed., SAS Institute Inc, Cary NC.

Loewenstein, G., & Issacharoff, S. (1994). Source dependence in the valuation of objects. *Journal of Behavioral Decision Making. 7* (3), 157-168.

Lukaszewski, A. W., & Roney, J. R. (2009). Estimated hormones predict women's mate preferences for dominant personality traits. *Personality and Individual Differences, 47* (3), 191-196.

MacLeod, C., Mathews, A. M., & Tata, P. (1986). Attentional bias in emotional disorders. *Journal of Abnormal Psychology, 95* (1), 15-20.

Mandel, D. R. (2002). Beyond mere ownership: Transaction demand as a moderator of the endowment effect. *Organizational Behavior and Human Decision Processes*, *88* (2)*,* 737-747.

Mandel, N., & Heine, S. J. (1999). Terror management and marketing: He who dies with the most toys wins, in E. J. Arnould, & L. M. Scott (Eds.), *Advances in Consumer Research Volume 26* (pp.527-532). Provo, UT: Association for Consumer Research.

Mandel, N., & Smeesters, D. (2008). The sweet escape: Effects of mortality salience on consumption quantities for high- and low-self-esteem consumers. *Journal of Consumer Research*, *35* (2), 309-323.

Maner, J. K., DeWall, C. N., & Gailliot, M. T. (2008). Selective attention to signs of success: Social dominance and early stage interpersonal perception. *Personality and Social Psychology Bulletin, 34* (4), 488-501.

Maner, J. K., Gailliot, M. T., & DeWall, C. N. (2007). Adaptive attentional attunement: Evidence for mating-related perceptual bias. *Evolution and Human Behavior, 28* (1), 28-36.

Markman A. B., & Brendl, C. M. (2000). The influence of goals on value and choice. *The Psychology of Learning and Motivation*, *39*, 97-128.

Martin, V. T., & Behbehani, M. (2006). Ovarian hormones and migraine headache: Understanding mechanisms and pathogenesis-Part 2. *Headache, 46* (3), 365-386.

Mason, R. S. (1981). *Conspicuous consumption: A study of exceptional consumer behaviour.* Westmead, England: Gower.

Mehrabian, A. (1968). Relationship of attitude to seated posture orientation and distance. *Journal of Personality and Social Psychology, 10* (1), 26-30.

Mick, D. G. (1996). Are studies of dark side variables confounded by socially desirable responding? The case of materialism. *Journal of Consumer Research, 23* (2), 106-119.

Miller, G. F. (2009). *Spent: Sex, evolution, and consumer behavior*. New York, NY: Viking.

Miller, G. F. (2010). What marketers can learn from lap-dancers: A field study of ovulatory cycle effects on consumer behavior. In M. C. Campbell, J. Inman, & R. Pieters (Eds.), *Advances in Consumer Research Volume 37* (pp. 278-279). Duluth, MN: Association for Consumer Research.

Miller, G., Tybur, J. M., & Jordan, B. D. (2007). Ovulatory cycle effects on tip earnings by lap dancers: economic evidence for human estrus? *Evolution and Human Behavior*, *28* (6), 375-381.

Morewedge, C. K., Shu, L. L., Gilbert, D. T., & Wilson, T. D. (2009). Bad riddance or good rubbish? Ownership and not loss aversion causes the endowment effect. *Journal of Experimental Social Psychology*, *45* (4), 947-951.

Morrison, G. C. (1997). Willingness to pay and willingness to accept: Some evidence of an endowment effect. *Applied Economics*, *29* (4), 411-417.

Moschis, G. P. & Moore, R. L. (1982). A longitudinal study of television advertising effects. *Journal of Consumer Research, 9* (3), 279-286.

Moskowitz, G. B. (2002). Preconscious effects of temporary goals on attention. *Journal of Experimental Social Psychology, 38* (4), 397-404.

Munro, A., & Sugden, R. (2003). On the theory of reference-dependent preferences. *Journal of Economic Behavior and Organization*, *50* (4), 407-428.

Nelissen, R. M. A, & Meijers, M. H. C. (2011). Social benefits of luxury brands as costly signals of wealth and status. *Evolution and Human Behavior, 32* (5), 343-355.

Novemsky, N., & Kahneman, D. (2005). The boundaries of loss aversion. *Journal of Marketing Research*, *42* (2), 119-128.

O'Cass, A., & Frost, H. (2002). Status brands: Examining the effects of non-product-related brand associations on status and conspicuous consumption. *Journal of Product and Brand Management, 11* (2), 67-88.

Park, J. K., & John, D. R. (2010). Got to get you into my life: Do brand personalities rub off on consumers? *Journal of Consumer Research, 37* (4), 655-669.

Reb, J., & Connolly, T. (2007). Possession, feelings of ownership and the endowment effect. *Judgment and Decision Making, 2* (2), 107-114.

Regan, P. (1998). Minimum mate selection standards as a function of perceived mate value, relationship context and gender. *Journal of Psychology and Human Sexuality, 10* (1), 53-73.

Richins, M. L. (1994a). Special possessions and the expression of material values. *Journal of Consumer Research, 21* (3), 522-533.

Richins, M. L. (1994b). Valuing things: The public and private meanings of possessions. *Journal of Consumer Research, 21* (3), 504-521.

Richins, M. L. (2011). Materialism, transformation expectations, and spending: Implications for credit use. *Journal of Public Policy & Marketing, 30* (2), 141-156.

Richins, M. L., & Dawson, S. (1992). A consumer values orientation for materialism and its measurement: Scale development and validation. *Journal of Consumer Research, 19* (3), 303-316.

Rindfleisch, A., Burroughs, J. E., & Denton, F. (1997). Family structure, materialism, and compulsive consumption. *Journal of Consumer Research, 23* (4), 312-325.

Rindfleisch, A., Burroughs, J. E., & Wong, N. (2009). The safety of objects: Materialism, existential insecurity, and brand connection. *Journal of Consumer Research*, *26* (1), 1-16.

Roberts, J. A., Manolis, C., & Tanner Jr., J. F. (2003). Family structure, materialism, and compulsive buying: A reinquiry and extension. *Journal of the Academy of Marketing Science, 31* (3), 300-311.

Roberts, J. A., Tanner Jr., J. F., & Manolis, C. (2005). Materialism and the family structure-stress relation. *Journal of Consumer Psychology, 15* (2), 183-190.

Roney, J. R. (2003). Effects of visual exposure to the opposite sex: Cognitive aspects of mate attraction in human males. *Personality and Social Psychology Bulletin*, *29* (3), 393-404.

Roney, J. R., & Simmons, Z. L. (2008). Women's estradiol predicts preference for facial cues of men's testosterone. *Hormones and Behavior, 53* (1), 14-19.

Rose, P. (2007). Mediators of the association between narcissism and compulsive buying: The roles of materialism and impulse control. *Psychology of addictive behaviors, 21* (4), 576-581.

Rose, P., & DeJesus, S.P. (2007). A model of motivated cognition to account for the link between self-monitoring and materialism. *Psychology & Marketing, 24* (2), 93-115.

Roskos-Ewoldsen, D. R., & Fazio, R. H. (1992). On the orienting value of attitudes: Attitude accessibility as a determinant of an object's attraction of visual attention. *Journal of Personality and Social Psychology*, *63* (2), 198-211.

Ross, L., Greene, D., & House, P. (1976). The "false consensus effect". An egocentric bias in social perception and attribution processes. *Journal of Experimental Social Psychology, 13* (3), 279-301.

Rucker, D. D., & Galinsky, A. D. (2008). Desire to acquire: Powerlessness and compensatory consumption. *Journal of Consumer Research, 35* (2), 257-267.

Rucker, D. D., & Galinsky, A. D. (2009). Conspicuous consumption versus utilitarian ideals: How different levels of power shape consumer behavior. *Journal of Experimental Social Psychology, 45* (3), 549-555.

Saad, G. (2007). *The Evolutionary Bases of Consumption*. Mahwah, NJ: Lawrence Erlbaum.

Saad, G., & Gill, T. (2000). Applications of evolutionary psychology in marketing. *Psychology & Marketing, 17* (12), 1005-1034.

Saad, G., Vongas, J. G. (2009). The effect of conspicuous consumption on men's testosterone levels. *Organizational Behavior and Human Decision Processes, 110* (2), 80-92.

Schmitt, D. P. (2005). Sociosexuality from Argentina to Zimbabwe: A 48-nation study of sex, culture, and strategies of human mating. *Behavioral and Brain Sciences*, *28* (2), 247-311.

Schroeder, J. E., & Dugal, S. S. (1995). Psychological correlates of the materialism construct. *Journal of Social Behavior and Personality, 10* (1), 243-243.

Sen, S., & Johnson, E. J. (1997). Mere-possession effects without possession in consumer choice. *Journal of Consumer Research*, *24* (1), 105-117.

Shariff, A. F., Norenzayan, A. (2007). God is watching you. Priming God concepts increases prosocial behavior in an anonymous economic game. *Psychological Science, 18* (9), 803-809.

Shavitt, S. (1990). The role of attitude objects in attitude functions. *Journal of Experimental Social Psychology 26* (2), 124-148.

Sheldon, K. E., Ryan, R. M., Deci, E. L., & Kasser, T. (2004). The independent effects of goal contents and motives on well-being: It's both what you pursue and why you pursue it. *Personality and Social Psychology Bulletin, 30* (4), 475-486.

Sheldon, K. E., Sheldon, M. S., & Osbaldiston, R. (2000). Prosocial values and group-assortation within an N-person prisoner's dilemma. *Human Nature, 11* (4), 387-404.

Sheldon, K. M. & McGregor, H. (2000). Extrinsic value orientation and the “tragedy of the commons." *Journal of Personality, 68* (2), 383-411

Sheldon, K. M., & Kasser, T. (1995). Coherence and congruence: Two aspects of personality integration. *Journal of Personality and Social Psychology, 68* (3), 531-543.

Sheldon, K. M., & Kasser, T. (2008). Psychological threat and extrinsic goal striving. *Motivation and Emotion*, *32* (1), 37-45.

Shrum, L. J., Burroughs, J. E., & Rindfleisch, A. (2005). Television’s cultivation of material values. *Journal of Consumer Research, 32* (2), 473-479.

Silverstein, M. J., & Fiske, N. (2003). Luxury for the masses. *Harvard Business Review, 81* (4), 48-57.

Simpson, J. A., & Gangestad, S. W. (1991). Individual differences in sociosexuality: Evidence for convergent and discriminant validity. *Journal of Personality and Social Psychology*, *60* (6), 870-883.

Simpson, J. A., & Gangestad, S. W. (1992). Sociosexuality and romantic partner choice. *Journal of Personality*, *60* (1), 31-51.

Singh, D. (1993). Adaptive significance of female physical attractiveness – Role of waist-to-hip ratio. *Journal of Personality and Social Psychology, 65* (2), 293-307.

Sivanathan, N., & Pettit, N. C. (2010). Protecting the self through consumption: Status goods as affirmational commodities. *Journal of Experimental Social Psychology, 46* (3), 564-570.

Snyder, C. R., & Endelman, J. R. (1979). Effects of degree of interpersonal similarity on physical distance and self-reported attraction: A comparison of uniqueness and reinforcement theory predictions. *Personality and Individuals Differences, 47* (3), 492-505.

Solberg, E. G., Diener, E., & Robinson, M. D. (2004). Why are materialists less satisfied?, in *Psychology and consumer culture*, ed. Tim Kasser and Allen D. Kanner, Washington, DC: American Psychological Association, 29-48.

Solnick, S. J., & Hemenway, D. (1998). Is more always better? A survey on positional concerns. *Journal of Economic Behavior & Organization, 37* (3), 373-383.

Solomon, S., Greenberg, J., & Pyszczynski, T. A. (2004). Lethal consumption: Death-denying materialism, in T. Kasser, & A. D. Kanner (Eds.), *Psychology and consumer culture: The struggle for a good life in a materialistic world* (pp. 127-146). Washington, DC: American Psychological Association.

Steiner, M., Dunn, E., & Born, L. (2003). Hormones and mood: From menarche to menopause and beyond. *Journal of Affective Disorders, 74* (1), 67-83.

Strahilevitz, M. A., & Loewenstein, G. (1998). The effect of ownership history on the valuation of objects. *Journal of Consumer Research, 25* (3)*,* 276-289.

Styles, E. A. (2005). *Attention, perception and memory. An integrated introduction.* Hove and New York: Psychology Press.

Sundie, J. M., Kenrick, D. T., Griskevicius, V., Tybur, J. M., Vohs, K. D., & Beal, D. J. (2011). Peacocks, Porsches, and Thorsten Veblen: Conspicuous consumption as a sexual signaling system. *Journal of Personality and Social Psychology, 100* (4), 664-680.

Thaler, R. H. (1980). Toward a positive theory of consumer choice. *Journal of Economic Behavior and Organization, 1* (1), 39-60.

Tom, G., Nelson, C., Srzentic, T., & King, R. (2007). Mere exposure and the endowment effect on consumer decision making. *Journal of Psychology, 141* (2)*,* 117-125.

Trivers, R. L. (1972). Parental investment and sexual selection. In B. G. Campbell (Ed.), *Sexual selection and the descent of man* (pp. 136−179). Chicago: Aldine.

Tukey, J. W. (1977). *Exploratory data analysis*. Reading, MA: Addison-Wesley.

Tversky, A., & Kahneman, D. (1991). Loss aversion in riskless choice: A reference-dependent model. *The Quarterly Journal of Economics, 107* (4)*,* 1039-1061.

Van Boven, L., Campbell, M. C., & Gilovich, T. (2010). Stigmatizing materialism: On stereotypes and impressions of materialistic and experiential pursuits. *Personality and Social Psychology Bulletin*, *36* (4), 551–563.

Van Boven, L., Loewenstein, G., & Dunning, D. (2003). Mispredicting the endowment effect: Underestimation of owners' selling prices by buyer's agents. *Journal of Economic Behavior and Organization, 51* (3), 351-363.

Van den Bergh, B., Dewitte, S., & Warlop, L. (2008). Bikinis instigate generalized impatience in intertemporal choice. *Journal of Consumer Research, 35* (1), 85-97.

Vansteenkiste, M., Duriez, B., Simons, J., & Soenens, B. (2006). Materialistic values and well-being among business students: Further evidence for their detrimental effect. *Journal of Applied Social Psychology, 36* (12), 2892-2908.

Veblen, T. (1994). *The theory of the leisure class*. New York: Dover. (Original work published 1899).

Vigneron, F., & Johnson, L. W. (2004). Measuring perceptions of brand luxury. *Brand Management, 11* (6), 484-506.

Vohs, K. D., Mead, N. L., & Goode, M. R. (2008). Merely activating the concept of money changes personal and interpersonal behavior. *Current Directions in Psychological Science, 17* (3), 208-212.

Vohs, K. D., Mead, N. L., & Goode, M. R. (2006). The psychological consequences of money. *Science, 314* (5802), 1154-1156.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, *54* (6), 1063–1070.

Watson, J. J. (2003). The relationship of materialism to spending tendencies, saving, and debt. *Journal of Economic Psychology, 24* (6), 723-739.

Webster, G. D., & Bryan, A. (2007). Sociosexual attitudes and behaviors: Why two factors are better than one. *Journal of Research in Personality, 41* (4), 917–922

Williams, L. E., & Bargh, J. A. (2008). Keeping one's distance: The influence of spatial distance cues on affect and evaluation. *Psychological Science, 19* (3), 302-308.

Wong, N. Y. (1997). Suppose you own the world and no one knows? Conspicuous consumption, materialism and self. In M. Brucks & D. MacInnis (Eds*.), Advances in Consumer Research Volume 24* (pp. 197-203). Provo, UT: Association for Consumer Research.

Wong, N. Y., & Ahuvia, A. (1998). Personal taste and family face: Luxury consumption in Confucian and western societies. *Psychology and Marketing, 15* (5), 423-441.

Doctoral dissertations from the Faculty of Business and Economics see:

http://www.kuleuven.be/doctoraatsverdediging/archief.htm