

Can Physiological Factors Influence Consumer Preferences Across Countries?

An Exploration of Brand Market Shares and Male Organ Sizes

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ABSTRACT

This article extends the literature on cross-country cultural influences on consumer behavior by exploring the influence that physiological and biological factors may have on consumer preferences across countries. As the specific case studied, the authors explore the relationship between average male penile length in a country and consumer preference for prestige brands in the country. Data from two product categories, cars and smartphones, indicate a negative correlation between penile length and consumer preference for more prestigious brands across countries. This relationship is found to be mediated by perceived sexual adequacy and self-esteem levels in countries, suggesting that male consumers in countries with smaller organs may symbolically compensate a lack of sexual adequacy by buying more prestigious brands, and that lower self-confidence related to smaller organs is also reflected in preference for more prestigious, lower-risk brands. The authors theorize several causal mechanisms explaining the correlation. The mechanisms involve physiological–psychological co-drivers (e.g., the interplay between perceived sexual adequacy, self-esteem, and organ size) as well as underlying biological factors (e.g., testosterone).

KEYWORDS: male organ; penile length; brands; market share; symbolic self-completion; self-esteem

1. Introduction

The impact of cross-country factors, such as cultural values, on consumer behavior is of increasing interest to researchers in marketing and consumer psychology (e.g., Alm and Torgler 2006; Johnson et al. 2002; Kim, Pan, and Park 1998; Lynn et al. 1993; Park and Rabolt 2009; Taylor 2000; Xu et al. 2004). A growing attention has recently been paid, especially, to the question of how cross-country factors influence consumers' preferences for branded products and services, or socially relevant goods (e.g., Auger et al. 2010; Dawar and Parker 1994; Fischer et al. 2010; Gürhan-Canli and Maheswaran 2000). Park and Rabolt (2009), for instance, provide a cross-cultural investigation of consumers' value perceptions in fashion apparel, and Auger et al. (2010) show that the social attributes and branding of products influence consumers' purchase behavior more in some countries than in others.

However, whereas the extant literature documents the influence of cross-country socio-cultural factors on consumers, less is known about whether more deeply-rooted, biological or physiological factors may also have influence on cross-country consumer behaviors. The present article addresses this research gap by turning the attention to *physio-psychological influences* on consumer preferences across countries. Specifically, such influences refer to the effects that the physiological characteristics of the consumers of a country—and cognitions related to the physiological characteristics—have on consumer preferences in the country.

As a focal case of physio-psychological influences, the present article studies the relationship between consumer preference for conspicuous, prestige-oriented brands (see Braun and Wicklund 1989) in a country, and the physiological variable of average male penile length in the country. Probably due to the taboo nature of human genitalia, research looking into this physiological variable has so far been sparse in social sciences in general (cf. Ostberg 2011). Nevertheless, interest in this variable has recently emerged, as it has been found that the penile length in a country may correlate with economic phenomena, such as GDP (Westling 2011). Continuing this line of research, this article reports an

investigation—which is, to the best of the authors' knowledge, the first of its kind—into the link between penile length and consumer preferences across countries.

There are several reasons why penile length can be expected to be linked to consumer preferences across countries. First, behavioral research has found that biological factors such as genes, hormones, and physiology can affect consumer preferences in general, besides purely psychological and social factors (e.g., Cotte and Wood 2004; Durante et al. 2011; Perry 1973; Saad and Stenstrom 2012; Simonson and Sela 2011; Van den Bergh et al. 2008; Witt 1991; see also Saad and Gill 2000). Second, previous research has also established that consumption behaviors can be driven by sex-related or sexual factors, in particular (e.g., Black et al. 2010; Dahl et al. 2009; Durante et al. 2011; Van den Bergh 2008). Third, conventional "wisdom" suggests that penile length could be one particular biological factor that is potentially linked to consumer preferences for certain kinds of products or brands. Most notably, it is a commonplace assumption that a fancy, prestige-oriented car, for example, may act as a "penis extension" for male consumers.

Thus, the aim of this article is to provide theoretical development as well as preliminary empirical evidence of the link between penile length and consumer preference for prestige brands across countries. The primary focus is on theoretical development, that is, on theorizing and explicating a set of causal mechanisms—partly complementary and partly alternative—that may give rise to a correlation between this physiological variable and consumer preferences. Specifically, the present theoretical development considers underlying mechanisms involving physiological and biological factors, as combined to psychological ones. Secondly, illustrative country-level empirical data is provided, in order to assess the prevalence of the proposed theoretical mechanisms. The present data pertains to two product categories, enabling the analysis of consumer preferences for a more vs. less prestigious brand in both product categories.

The article is structured as follows (cf. Mishra et al. 2012). First, a simple empirical pre-study is reported, analyzing data pertaining to the aforementioned "classical" case of cars. Specifically, the pre-study explores the correlation between the average penile length in a sample of developed countries ($n =$

23) and consumer demand for a more vs. less prestigious car brand in those countries. Following this pre-study, the authors turn to theorize and explicate the causal mechanisms that may explain a correlation between penile length and consumer preferences across countries. Thereafter, another country-level study (n = 41) is reported, focusing on the link between penile length and brand preference in the smartphone product category, as well as two mediating factors. Finally, a discussion of the results is provided, as well as conclusions and limitations presented.

2. Pre-Study: Cars

First, as an explorative pre-study pertaining to car brands is presented, below, reporting the correlation between the penile length and the preference for (i.e., relative market share of) a more vs. less prestigious car brand (VW Golf vs. Skoda Octavia) across countries.

2.1 Data

2.1.1 Penile Length Data

The data concerning the average penile lengths in various countries were retrieved from a freely-available academic data source¹. This data source has originally been compiled on the basis of a large number of scientific medical studies conducted in different countries, which have measured the average penile lengths in country-specific samples of men. The same data were utilized, for instance, in a recent investigation of the relationship between penile length and GDP (Westling 2011).

2.1.2 Car Brand Data

¹ <http://www.everyoneweb.com/worldpenissize/>

Car brand market share data were retrieved from the data source bestsellingcars.com². This source compiles information from market research studies in various countries, tracking the sales of the countries' best-selling car brands and models. For most countries included, the reports include approximately 20 most-sold models. For these car models, the latest sales numbers are listed for the most recent month, quarter, or year (depending again on the original source).

For each country, the latest sales reports were retrieved, as available in September 2011. To enable the comparability of countries and a reasonable sample size, such car brand models were needed for the analysis that would be widely sold in most countries—so that the selected brands could be widely found on the lists of twenty or so most-sold brands in each country. With this aim, VW Golf was selected as a relatively more prestigious car brand to be analyzed, and Skoda Octavia as a less prestigious car brand. Although VW Golf is not an ultra-prestigious brand, such as Mercedes-Benz or Jaguar, it is in any case a relatively highly-regarded brand³, especially in comparison with Skoda. More importantly, the comparison of VW Golf vs. Skoda Octavia for the study was especially warranted for two further reasons. First, being widely-sold car models around the world, VW Golf and Skoda Octavia were among the few car models that could be found in the sales reports of a large number of countries. In contrast, many extremely fancy brands such as Mercedes or Jaguar could not be found widely in the country-specific lists of the most sold cars (because they are not among the 20 most sold cars in most countries). Second, and more importantly, VW Golf and Skoda Octavia are manufactured by the same corporation (Volkswagen Group) and these two car models are to a large extent similar in technical terms, being built on the same product platform⁴. Thus, consumer choice between these car models is, indeed, to a very large extent a choice of a more vs. less prestigious brand, rather than a choice between fundamentally or functionally different kinds of products.

² <http://bestsellingcarsblog.com/about/>

³ e.g., <http://www.articlesnatch.com/Article/Which-Gadgets-On-Volkswagen-Vehicles-Make-Their-Brand-Type-Really-Reliable-And-Safe-/1858299>

⁴ http://en.wikipedia.org/wiki/Skoda_Octavia

2.1.3 Countries Included

The pre-study data covers those EU countries and non-European OECD countries for which data was available for both penile lengths and the relative sales of VW Golf and Skoda Octavia. The choice to exclude non-developed countries from the analysis was made because consumers in developing countries do not have a comparable opportunity to buy cars, especially more prestigious ones. The final sample size was 23 countries, including Austria, Bosnia & Herzegovina, Croatia, Czech Republic, Denmark, France, Germany, Greece, Hungary, Iceland, Ireland, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, the UK, and Australia.

2.2 Results

Table 1 reports the Spearman rank-order correlation between the variables: the relative market share of VW Golf vs. Skoda Octavia ($MS_{VW\ Golf}/MS_{Skoda\ Octavia}$) in a country, and the average penile length in the country⁵ (Appendix A depicts a scatter plot of the observed values). The Spearman correlation coefficient between the penile length in a country and the relative market share of VW Golf vs. Skoda Octavia is found to be negative and significant ($\rho(21) = -.36, p < .05$). This finding preliminarily suggests that smaller male organ sizes in a country predict a preference for a more prestigious brand therein, and larger male organ sizes a preference for a less prestigious brand.

As to another relevant country-level variable, a modest negative correlation is also found between penile length and the country's overall GDP per capita⁶, albeit non-significant ($\rho = -.19, p > .1$). Yet, the negative sign here is assuring, as earlier research has found a modest negative correlation between penile length and GDP, as well (Westling 2011).

 INSERT TABLE 1 ABOUT HERE

⁵ Specifically, the Spearman correlation coefficient was calculated instead of the Pearson correlation coefficient because Spearman correlation involves a non-parametric test which is suitable when the variables are not normally distributed or linearly related (such as the proportional market share data).

⁶ <http://www.imf.org/external/pubs/ft/weo/2010/02/weodata/index.aspx>

2.3 Discussion: Pre-Study

In summary, the pre-study found that at the country level, smaller male organ sizes correlate with the preference for a more prestigious car brand. This supports the conventional wisdom that prestigious cars may act as kinds of penis extensions for male consumers. However, while there is no previous, scientific research that would have reported this correlation with empirical data, there exists no previous literature that would identify or explicate the theoretical reasons or causal mechanisms underlying this correlation, either. Hence: Why is this correlation found? The authors turn next to theories and findings from fundamental psychological and biological research to identify the answer(s) to this question, that is, the potential causal mechanisms for the influence of penile length on consumer preferences across countries.

3. Theoretical Rationale

Based on research and theory in general consumer psychology and behavior, it is possible to outline the potential causal mechanisms that are likely to explain or predict the detected correlation. These causal mechanisms can be categorized under two headings: (I) explanations with physiological and psychological co-drivers and (II) explanations with common, underlying biological factors. The former refer to such causal mechanisms whereby male consumers' conscious reflection or awareness of their physiological measures has influence on their brand preferences. The latter refer to such causal mechanisms whereby certain underlying biological factors (e.g., hormones, genes) influence both penile lengths and brand preferences.

3.1 Physiological-psychological co-drivers

In terms of (I) physiological-psychological co-drivers, the link between smaller male organs and preference for more prestigious brands may, first of all, be explained by symbolic self-completion theory (Braun and Wicklund 1989; Wicklund and Gollwitzer 1981, 1982; see also Schouten 1991; Solomon 1983). This theory (Wicklund and Gollwitzer 1982) proposes that people are likely to engage in symbolic

acts to "complete" a certain self-definition of theirs—especially in case they feel uncertain about that self-definition due to a lack of actual substance related to it. In other words, when people have a certain desired self-definition or identity (such as being "a musical person") but are experiencing inadequacies or deficiencies in substantial traits or competencies related to the identity (e.g., a lack of musical skills), they tend to engage in symbolic activities to compensate these shortfalls (Wicklund and Gollwitzer 1982). The symbolic activities, in turn, often take the form of consumption of products that are seen as symbols for the identity (e.g., purchasing a top-notch musical instrument), or, conspicuous consumption of generally prestigious products (Bauer and Wicklund 1989).

Analogously, in the case of male organs, a larger organ size is likely to be associated with male consumers' sexual identity and competence (Winter 1989; Wylie and Eardley 2007)—and a smaller size, correspondingly, to a feeling of inadequate male sexual identity. Based on the symbolic self-completion theory, then, in countries where male consumers have smaller organs, they may be more predisposed to symbolically complete a perceived inadequacy of sexual identity by buying sexier or more prestigious brands. Consequently, a negative correlation between average penile length in a country and preference for more conspicuous brands is, indeed, likely to arise.

Second, this correlation can also be expected to arise based on theory related to overall self-esteem. To the extent that penis size is linked to perceived self-competence and overall self-esteem (Winter 1989; Wylie and Eardley 2007), male consumers in countries with smaller organs may be inclined to make lower-risk choices in terms of brands—due to risk aversion stemming from lower self-confidence. One of the main functions of strong brands, namely, is to reduce the consumer's risk in decision-making (e.g., Erdem and Swait 1998; Peter and Ryan 1976; Taylor 1974). Therefore, male consumers in countries with smaller organs may, due to their lower self-esteem and greater risk-aversion, tend to prefer socially stronger prestige brands. Males in countries with larger organs, accordingly, may not equally "need" a strongly-branded product but have greater willingness or courage to buy weakly-branded alternatives as well.

Based on the aforementioned two theoretical mechanisms ([1] symbolic self-completion due to perceived lack of sexual adequacy; [2] social risk aversion due to lower self-esteem), we can hence expect that a smaller male organ size in a country is related to preferences for more prestigious brands—and that this effect is mediated by (1) perceived lack of sexual adequacy as well as (2) lower general self-esteem in the country.

3.2 Common, underlying biological factors

When it comes to the (II) potential explanations involving common underlying biological factors, risk-aversion vs. risk-taking related to self-confidence may be at play as well. Specifically, both penile length (Boas et al. 2006) and self-confidence and risk-taking tendencies (Apicella et al. 2008; Stenstrom et al. 2012) are related to levels of testosterone in males. Thus, an empirical pattern whereby penile length in a country is correlated with consumer preference for stronger brands—which presumably have a lower objective or social risk—may also be explained by the fact that low testosterone levels cause *both* lower penile length *and* a preference to choose stronger brands of low risk. Nevertheless, should this be the case, the correlation between penile length and consumer preference should, again, be correlated with the global self-esteem/confidence of the consumers in the country. Namely, if low testosterone causes both smaller organs and lower self-esteem, and the latter causes preference for stronger brands, then the effect of penile length on brand preference should also be, empirically, mediated by (low) self-esteem.

Other biological drivers that might underlie both penile length and brand preference, and thereby explain the correlation, could relate to genes. For example, if a certain gene's prevalence in the population of a country both determines penile length and affects neural circuitry (cf. Van den Bergh et al. 2008) so that the brain has a certain kind of brand preference "hard-wired" in it, then penile length and brand preference may again end up correlating. If, for instance, a certain gene both leads to larger organs and a hard-wired risk-taking tendency, then the preference for riskier, less strong brands in a country will be correlated with larger organs.

Table 2 summarizes the possible theoretical reasons for the correlation between penile length and brand preference, when it comes to causal mechanisms potentially giving rise to a negative correlation. Nevertheless, the bottom of Table 2 also lists some explanations taking into account that the found correlations can be "spurious". That is, due to the nature of the data, the correlations might arise even if there were no strong causal mechanisms involved. The possibility of such spurious correlations is briefly discussed next.

3.3 Spurious correlation?

Notwithstanding the theoretical explanations for the correlation, a found correlation might also be "spurious". That is, the correlations found might not be explained by the real causal mechanisms theorized, but they might just arise from random empirical occurrences or links to other variables. For instance, if a (very) high penile length in a country leads to low economic performance or affluence in terms of GDP (Westling 2011), then the correlation of penile length and preference for more prestigious brands can be spurious (if low affluence simultaneously increase the demand for less prestigious brands and reduces the demand for more prestigious brands). Another possibility is that penile length in a country is linked to certain life conditions (e.g., nutrition levels or climate) and the same life conditions are linked to product and brand demand (e.g., demand for more robust products and brands). In this case, too, a spurious correlation between penile length and brand preference might be detected.

INSERT TABLE 2 ABOUT HERE

Assuming that there is a possibility of a spurious correlation, how to verify whether a spurious correlation is actually the case or not? An effective solution is to analyze further empirical evidence from another product category, and to examine data on the proposed mediating variables as well. Namely, if the correlations are mostly spurious, then the correlations should not be explained by or reflected onto the

proposed mediating variables, such as perceived sexual competence or global self-esteem in the country. To seek further evidence of this, another study is reported next, with empirical data on smartphone brands. Analyzing the data with partial least squares (PLS) path modeling, particularly, enables examination of both direct and mediated effects, as well as the ruling out of potential spurious correlations (e.g., controlling for the GDP).

4. Study with Mediators: Smartphone Brands

This study examines consumer preferences in a popular contemporary category of products: smartphones. Similarly as in cars, certain brands, such as Apple's iPhone, are commonly considered to be cool and prestigious in the category of smartphones. Other brands, in contrast, are not considered sexy or prestigious at all—like Nokia (Theisinger 2010). With a larger sample of countries than for cars, this study not only tests the direct relationship between the average penile length in a country and the market share for iPhone vs. Nokia, but also examines the proposed causal mechanisms explaining the relationship—by way of studying two key mediating variables: perceived sexual adequacy and global self-esteem in the country.

4.1 Data

4.1.1 Penile Length Data

The data concerning the average penile lengths in various countries were retrieved from the same source as in the pre-study on cars.

4.1.2 Brand Market Share Data

The data concerning the smartphone brand market shares were retrieved from the database of Statcounter⁷, which is a service-provider of Internet-traffic analytics. Statcounter has a "tracking code" installed on over 3 million websites globally. With the tracking code, Statcounter records all the visitors to the tracked sites. For each visitor detected, Statcounter analyzes, among other things, the Internet browser used by the visitor. Based on this information, Statcounter analyzes whether the site visit is done from a mobile device (vs. fixed computer) and, further, which Internet browser is used. The country in which the visitor is located is also registered. With this extensive sample of Internet site visits, Statcounter calculates approximate "market shares" for different mobile Internet browsers, country-per-country. While these market shares of different mobile Internet browsers do not correspond one-to-one with the owners or purchasers of the different smartphones themselves, they provide a good proxy of usage of the smartphone brands. Namely, since a "smartphone" is by definition a cellphone with a mobile Internet access⁸, the usage shares of different cellphone brands' Internet browsers are likely to correspond well to the market shares of those smartphone brands themselves.

The specific data retrieved involved the brand market shares between July 2010 and July 2011. The analyses were conducted for two smartphone brands widely used in most countries: iPhone and Nokia. As previously mentioned, iPhone is commonly perceived as a more prestigious brand, and Nokia as a less prestigious brand.

4.1.3 Sexual Adequacy and Self Esteem Data

As a measure of (lack of) perceived sexual adequacy, data drawn from 'Global Study of Sexual Attitudes and Behaviors' survey was used, as reported in Laumann et al. (2006). The survey was originally conducted to study the subjective sexual well-being of adults in a large number of countries. From this data, four reflective indicators were utilized, to proxy sexual adequacy: (1) overall satisfaction that males in a country associate (on average) with their sexual function, (2) physical pleasure they get from sex, (3)

⁷ <http://gs.statcounter.com/>

⁸ http://www.pcmag.com/encyclopedia_term/0,2542,t=Smartphone&i=51537,00.asp

emotional pleasure they get from sex, and (4) the role/importance of sex in their life. The reliability of this four-item reflective measure was good, with Cronbach's alpha of .89.

For overall self-esteem, measures from Schmitt and Allik (2005) were utilized. They report data from dozens of countries on a variety of psychometric measures, including the widely-used Rosenberg self-esteem scale (RSES, Rosenberg 1965). For the present data, the country-specific mean levels of the RSES were used, as reported by Schmitt and Allik (2005).

4.1.4 Countries Included

The smartphone data covers the European countries available in the penile length database, added with non-European OECD countries as well as Hong Kong, Singapore, and Taiwan. These countries together are commonly considered to constitute the "developed countries" or "advanced economies"⁹. The choice to exclude non-developed countries from the analysis was made, again, because only consumers in developed countries had in 2010-11 the comparable opportunity and income to buy and use smartphones.

The home countries of the studied smartphone brands under study were excluded from the sample: Finland (Nokia) and the USA (iPhone). This exclusion was warranted for reliability and internal validity reasons. The inclusion of these countries might have biased the results because consumers tend to patriotically prefer their own home country's brand. The *n* of countries in the final sample was 41:

Australia, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Canada, Chile, Croatia, Czech Republic, Denmark, Estonia, France, Germany, Greece, Greenland, Hong Kong, Hungary, Iceland, Ireland, Israel, Italy, Japan, Macedonia, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russia, Serbia, Singapore, Slovakia, Slovenia, Spain, Sweden, Switzerland, Taiwan, Turkey, the UK.

4.2 Analysis and results

⁹ http://en.wikipedia.org/wiki/Developed_country.

As the main analysis method on the smartphone data, partial least squares (PLS) structural path modeling (Fornell and Cha 1994) was utilized. There were several reasons for this choice of method. The first reason to use PLS modeling rather than ordinary regression analysis is the fact that the sample size is rather small and the variables (e.g., the relative market shares) are not normally distributed. PLS modeling is suitable for small samples and does not require normality of variables (see Chin and Newsted 1999). Secondly, PLS modeling is also less vulnerable to multicollinearity and allows for simultaneous assessment of the mutual effects of multiple variables. This is favorable in the present study since penile length correlates with the main control variable, GDP per capita (Westling 2011). Thirdly, PLS modeling allowed to form a latent construct for the penile length in a country, estimated as a linear combination of the "raw" length measurement (as retrieved from the data source) and indicators of (a) whether the original measurement had been based on males' self-measures (or measured by researchers) and of (b) the age at which the measurement had been made. Adjusting for these factors is important because the raw length measures as such may be biased in the sense that self-reported measures are different—probably higher—than measures taken by researchers. Likewise, measures taken at different ages may also not be directly comparable, if left unadjusted. Fourthly and finally, PLS modeling also allowed conducting the mediation tests with the reflective multi-item measures of perceived sexual adequacy and overall self-esteem.

Specifically, SmartPLS (Ringle, Wende, and Will 2005) was employed, which enables single- and multi-item measurement, as well as the use of both reflective and formative scales (Fornell and Bookstein 1982). Two models were estimated: one without the mediating variables and one with the mediating variables included. The outcome variable was the relative preference in the country for iPhone over Nokia, measured as iPhone's market share relative to Nokia's market share ($MS_{\text{iPhone}}/MS_{\text{Nokia}}$).

As the main predictor variable, a latent construct of male organ size was used, determined as a weighted linear combination of (i) raw measure of penile length in the country (i.e., reported average length), (ii) self-measure dummy (of whether the original study reporting the penile length had been based on self-measurements), and (iii) the age at measurement (at which the measurement had been done). The

PLS procedure calculates a weighted linear combination of these formative indicators so that the prediction of the dependent variable is maximized. As a control variable, the country's GDP per capita was included. This variable was included as a control because more prestigious brands are often more expensive and demand for them might therefore correlate with the general affluence level in the country.

 INSERT TABLE 3 ABOUT HERE

Table 3 shows the raw correlations between the studied variables. Similarly as in the pre-study on car brands, there is a substantial negative correlation between penile length in a country, and preference for iPhone over Nokia therein ($r = -.47$). The correlation between penile length and the country's GDP is also negative ($r = -.50$), again. Appendix B depicts a scatter plot of the observed values.

Regarding the primary data analyses with PLS path modeling, Panel A of Table 4 presents the PLS results regarding the model *without* mediating variables, and Panel B of Table 4 presents the results regarding the model *with* the mediating variables. Panels A and B of Figure 1 correspondingly illustrate the found effects in the two models.

 INSERT TABLE 4 ABOUT HERE

INSERT FIGURE 1 ABOUT HERE

For the model *without* mediating variables, please refer to Panel A of Table 4 and Figure 1. With regard to the path coefficients, a significant negative effect of male organ size on the relative preference for iPhone over Nokia is revealed ($\beta = -.53, p < .05$). This result suggests that the more sizeable the male organs in a country, the less (more) preference for iPhone over Nokia (Nokia over iPhone). This supports the notion that the smaller the male organs, the higher the demand for a more prestigious brand. The

effect of the male organ size on GDP is also negative ($\beta = -.50, p < .01$), consistent with the findings of earlier research (Westling 2011). Yet, the effect of GDP on preference for iPhone over Nokia is non-significant. This is likely due to the fact that the purchase price of iPhone smartphones is not much higher than Nokia smartphones in absolute monetary terms, so that the country's exact affluence level does not have a significant impact on the relative demands in the present sample. In any case, this first model provides support to the conjecture that that male organ size has ability to predict the preference for prestigious brands, in the sense that smaller male organ sizes predict higher preference for a more prestigious brand.

The second and final model *with* the mediating variables included, enables examination of whether the causal process mechanism underlying the correlation between penile length and brand preferences involves the proposed factors of perceived sexual adequacy and global self-esteem. In this mediated model (Panel B of Table 4 and Figure 1), significant positive effects of male organ size on both perceived sexual adequacy ($\beta = .59, p < .01$) and overall self-esteem ($\beta = .61, p < .01$) are found. Perceived sexual adequacy and overall self-esteem, in turn, both have negative effects on the preference for iPhone over Nokia (Perceived sexual adequacy: $\beta = -.38, p < .05$; Overall self-esteem: $\beta = -.35, p < .05$). Furthermore, the inclusion of these mediating variables renders the direct path from male organ size to preference for the fancier brand non-significant ($\beta = -.06, p > .15$). Together these results support the notion that perceived sexual adequacy and overall self-esteem in a country fully mediate the relationship between average male organ size and preference for a more prestigious brand. That is, a smaller (larger) organ size predicts preference for more (vs. less) prestigious brand, as smaller (larger) organ sizes lead to lower (higher) perceived sexual adequacy and lower (higher) overall self-esteem, which in turn lead to preference for more (less) prestigious brand.

5. Discussion and Conclusion

5.1 Theoretical implications

The present research extends the study of cultural influences on consumer behaviors by investigating biological cross-country influences—and especially by being the first to report evidence of the physiological influence of male organ size on preference for prestigious brands across countries. In so doing, the present research adds a previously unstudied physiological variable—male penile length across countries—to the growing body of marketing and consumer research (e.g., Aspara and van den Bergh 2014; Durante et al. 2011; Saad and Gill 2000; Saad and Vongas 2009) that is interested in biological factors influencing consumption psychology and behavior. The main contribution is to theoretically explicate the alternative physiological-psychological and biological mechanisms that may explain the link between penile length and consumer brand preferences across countries. Moreover, the present research provides preliminary empirical evidence, which lends support to a mechanism whereby shorter penile lengths decrease perceived sexual adequacy and self-confidence in a country, and thereby predict the preference for stronger and more prestigious brands. Specifically, the lack of perceived sexual adequacy as a mediator suggests would suggest a mechanism based on symbolic self-completion theory (Braun and Wicklund 1989; Wicklund and Gollwitzer 1982): Insofar as male consumers in countries with smaller organs feel inadequate in terms of their male sexual identity, they may prefer sexier, more prestigious brands to symbolically complete their identity. The lack of general self-esteem as a mediator would, in turn, suggest a mechanism related to overall self-confidence: Insofar as male consumers in countries with smaller (larger) organs have lower (higher) self-esteem/confidence, they will have a lower (higher) preparedness to take risks (cf. Westling 2011; Winter 1989; Wylie and Eardley 2007). This lower (higher) preparedness to take risks is, in turn, likely to manifest in predisposition to choose stronger and more prestigious (less prestigious) brands in those countries.

At the same time, it should be noted that the theorization involving the psychological factors of perceived sexual adequacy and self-esteem is also consistent with the notion that there is an underlying, even more fundamental driver affecting both penile size *and* these psychological factors. The strongest candidate is testosterone, as both penile length and risk-taking tendencies are related to levels of testosterone in males (Apicella et al. 2008; Boas et al. 2006; Stenstrom et al. 2012). Thus, the proposed

physiological-psychological explanations as well as the found empirical patterns are not inconsistent, either, with the possibility of low testosterone levels causing both lower penile length and the preference to choose stronger brands of low risk.

5.2. Conclusions and Limitations

Even if the central aim of this article was to assess the possible influence of physio-psychological factors on brand preferences across countries, the results should not be read as evidence of pure "biologism", by ignoring the psycho-social dimensions of human behavior (see Bunge, 2001). As can be observed from the identified explanatory mechanisms for the observed correlation between penile length and brand preferences, the proposed mechanisms do not only encompass biological aspects (i.e., penile length and testosterone level) but also psychological factors (e.g., symbolic self-completion and self-esteem)—which in turn have further links to social and cultural factors (social risk; shared brand images and their status values in the social field). In other words, even though the proposed biological factors may indeed act as partial underlying drivers of causation, they will certainly interact with evolved psychological mechanisms and the external socio-cultural environment in influencing the eventual consumption behaviors in the marketplace (cf. Saad and Gill 2000).

In Popper's (1972) terms, the present research was, hence, ultimately interested in the entities from all the three worlds (i.e., nature, human consciousness, and culture), in trying to explain some of consumers' brand preferences across countries. Indeed, Popper's three world ontology should be understood to reflect anti-reductionist emergent materialism, meaning that it is not considered meaningful or possible to reduce all social/cultural issues to psychology nor or all psychological issues to biology. Assuming humans as highly complex systems exhibiting aspects of all three worlds, the intention was to explain male consumers' behavior with the help of *both* biological knowledge *and* knowledge emanating from social sciences. In the spirit of disciplinal convergence (see Saad and Gill 2000), the present approach has shown that by synthesizing or merging knowledge of various ontological levels/disciplines, it is possible to sketch new perspectives, explanatory mechanisms, and hypotheses regarding

consumption-related phenomena, which result from an interplay between consumer culture and various evolutionary, psychobiological, and sociobiological factors (see also Witt 1991).

As to the limitations of the present research, note also that while supporting the theorized causal mechanisms underlying the link between male organ sizes and brand preferences, the present studies cannot totally rule out the possibility that the correlations are partly "spurious". That is, the correlations might still partly arise from random empirical occurrences or links to other variables. For instance, if a (very) high penile length in a country leads to low economic affluence in terms of GDP (Westling 2011), then the correlation of penile length and preference for prestigious brands could be partly spurious. Of course, the present analyses controlled for the effect of GDP, which makes it improbable that the correlations are spurious in this specific sense—but there might be other sources of spurious correlation as well. Also, in our analyses, missing values on the mediating variables were replaced by means, which may bias our results, albeit not likely to any particular direction.

To verify the empirical and theoretical relationships, future research should ideally try to replicate the analyses with individual-level data or experiments, although sensitivity and privacy problems related to individual-level data-gathering (about penile lengths, especially) will be highly difficult to solve. Moreover, not many control variables—besides the affluence level (GDP)—were included in the present analyses, as analytical simplicity was preferred. Future research could incorporate further control and interaction variables.

Finally, the present data involved the overall market shares of the brands as dependent variables, yet concentrated on male organ size as the predictor variable. Thus, the role of female consumers in shaping the overall market shares in countries was obviously ignored. This was a pragmatic choice, since market share data was not available for male vs. female consumers, respectively. However, this choice was by no means made to downplay the role of female consumers or to give a gendered, overly masculine account of the phenomenon. In any case, female consumers should be taken into account in future research. At the same time, it must also be noted that the fact that the present sample did not differentiate

between male and female market shares is actually likely to underestimate the correlations rather than overestimate them. In other words, the results are, in this sense, conservative rather than exaggerative.

As a conclusion, and despite the limitations, the present research has managed to demonstrate that male organ size may indeed correlate with consumer preferences for particular kinds of brands and products across countries. This finding together with the proposed theorizations add an interesting, new dimension to the stream of the research that addresses whether and how biological factors, as well as related psychology pertaining to perceived sexual identity and competence, may influence consumer behavior across countries, besides socio-cultural values. Obviously, this also creates need for further research in which the role of the causal mechanisms underlying the links between brand preferences and organ sizes or other physiological factors will be studied with more nuanced data, methods, and settings.

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Table 1. Pre-study (cars): Correlations between the studied variables

| Variables | 1. | 2. | 3. |
|---|-----------|-----------|-----------|
| 1. Penile length | (N/A) | | |
| 2. GDP per capita | -.19 | (N/A) | |
| 3. MS _{VW Golf} /MS _{Skoda Octavia} | -.36* | .56** | (N/A) |

Table 2. Proposed explanatory mechanisms underlying the correlation between male organ size and brand preference

| Category of Explanation | | Correlation expected | Alternative/Specific Explanations | Suggested mediators |
|---|--|-----------------------------|--|---|
| <i>Causal mechanisms</i> | Physiological-psychological co-drivers (i.e. reflection of one's penile length eliciting brand preference) | Negative (-) | (1) Symbolic self-completion (Wicklund and Gollwitzer 1982): Male consumers with smaller organs feel inadequate in terms of male sexual identity → tend to prefer sexier brands to symbolically complete their identity | (Lack of) Perceived sexual inadequacy |
| | | Negative (-) | (2) Self-esteem and risk orientation: Male consumers with smaller (larger) organs have lower (higher) self-esteem/confidence and lower (higher) willingness to take risks (Westling 2011; Wylie and Eardley 2007; Winter 1989) → tend to prefer stronger (weaker) brands to minimize (allow) risk | (Lack of) Global self-esteem/confidence |
| | Common, underlying biological factors | Negative (-) | (1) Testosterone as underlying common factor: Both penile length (Boas et al. 2006) and risk-taking tendencies (Apicella et al. 2008) are related to levels of testosterone in males → Penile length and preference for riskier vs. less riskier brands become correlated | (Lack of) Global self-esteem/confidence |
| | | Negative (-) | (2) A certain gene as underlying common factor: There may be a certain gene that both determines penile length and affects neural circuitry of preference formation for brands → Penile length and preference for riskier vs. less riskier or more vs. less prestigious brands become correlated. | – |
| <i>Partly spurious correlation (no causality)</i> | | Negative (-) | (1) To the extent that (very) high penile length in a country is linked to low economic performance/GDP (Westling 2011), penile length and preference for prestige brands can be spuriously correlated —if low affluence is likely to increase the demand for less prestigious brands and reduce the demand for more prestigious brands. | – |
| | | Negative (-) | (2) To the extent that penile length in a country is linked to certain life conditions (e.g., nutrition levels or climate) and the same life conditions are linked to product and brand demand (e.g., demand for more robust products and brands), penile length and preference for brands can be spuriously correlated. | – |

Table 3. Smartphone study: Correlations between the studied variables

| Variables | 1. | 2. | 3. | 4. | 5. |
|--|-----------|-----------|-----------|-----------|-----------|
| 1. Penile length | (N/A) | | | | |
| 2. GDP per capita | -.50 | (N/A) | | | |
| 3. Preference for more prestigious brand (MSiPhone/MSNokia) | -.47 | .15 | (N/A) | | |
| 4. Perceived sexual adequacy | .59 | -.13 | -.59 | (.89) | |
| 5. Overall self-esteem | .61 | -.30 | -.57 | .54 | (N/A) |

Table 4. Smartphone study: PLS results on the effects of male organ size on brand preference

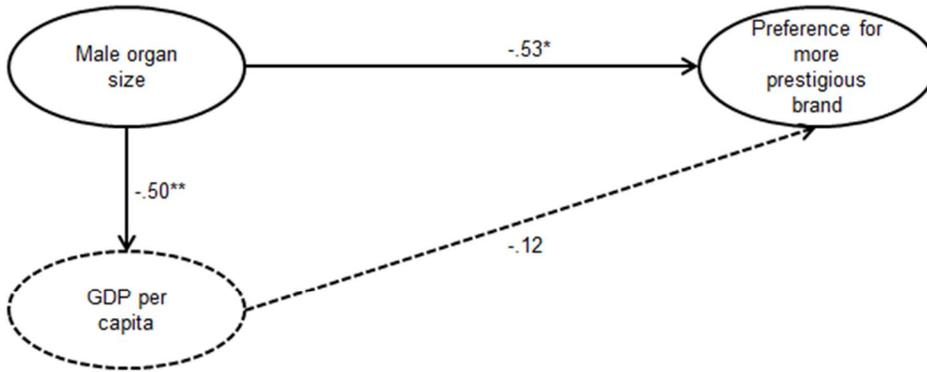
| <i>Effect of</i> | <i>On</i> | <i>Path coefficient</i> | <i>St. Err.</i> | <i>t value</i> |
|---|---------------------------------------|-------------------------|-----------------|----------------|
| Panel A: Model without Mediators | | | | |
| Male organ size | Preference for more prestigious brand | -.53 | .27 | 1.96* |
| Male organ size | GDP per capita | -.50 | .10 | 4.93** |
| GDP per capita | Preference for more prestigious brand | -.12 | .25 | .48 |
| Panel B: Model with Mediators | | | | |
| Male organ size | Preference for more prestigious brand | -.06 | .14 | .40 |
| Male organ size | Perceived sexual adequacy | .59 | .13 | 4.41** |
| Male organ size | Overall self-esteem | .61 | .16 | 3.93** |
| Perceived sexual adequacy | Preference for more prestigious brand | -.38 | .23 | 1.65* |
| Overall self-esteem | Preference for more prestigious brand | -.35 | .17 | 2.03* |
| Male organ size | GDP per capita | -.48 | .12 | 4.07** |
| GDP per capita | Preference for more prestigious brand | -.03 | .31 | .10 |

* $p < .05$, ** $p < .01$ (one-sided).

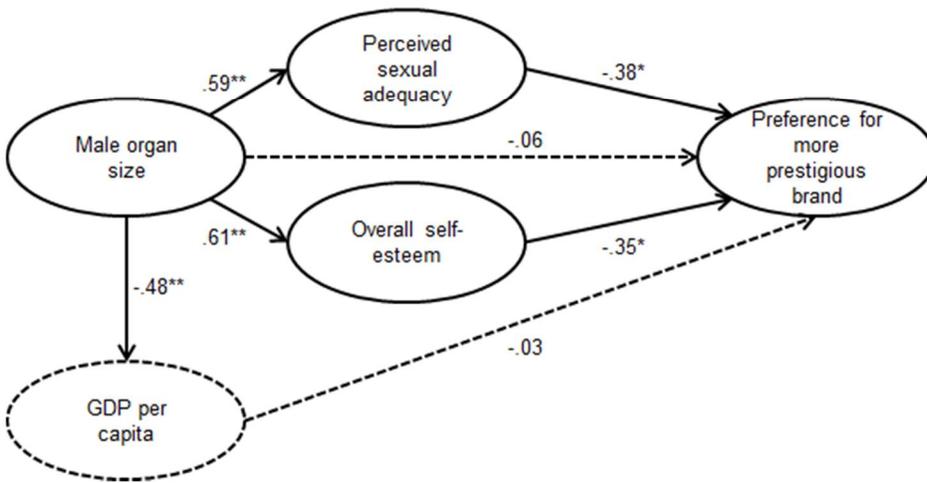
Notes: The path coefficients resulted from PLS algorithm on the original/whole sample. The standard errors and t-values were calculated through a bootstrapping routine with 500 resamples of 41 cases. Missing values were replaced with variable means.

Figure 1 Smartphone study: PLS results on male organ size as predicting brand preference

Panel A: Model without Mediators



Panel B: Model with Mediators



APPENDIX A

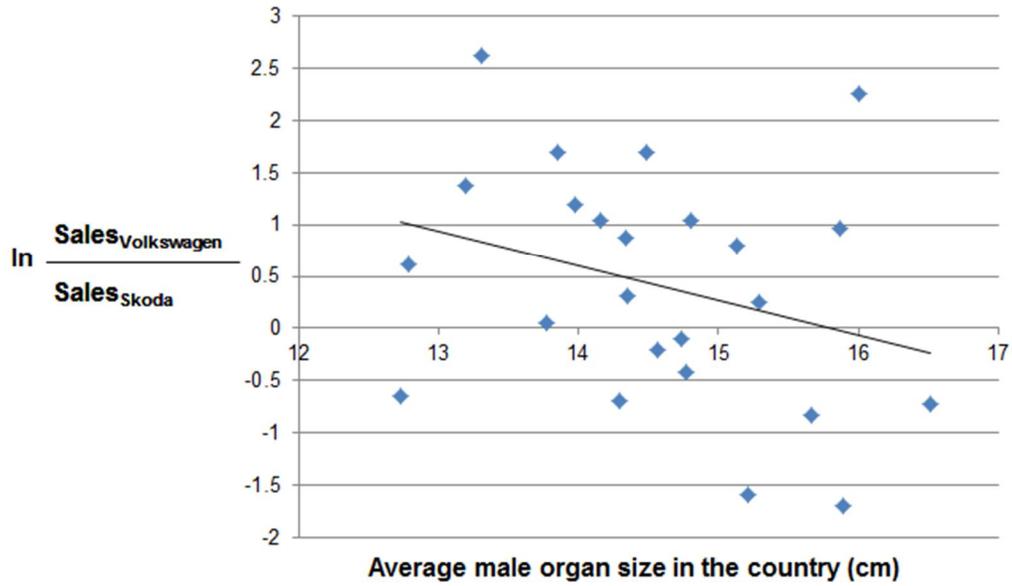


Figure A-1. The observed values of average male organ size and the sales of more vs. less prestigious car brands (VW Golf vs. Skoda Octavia) in the country sample

APPENDIX B

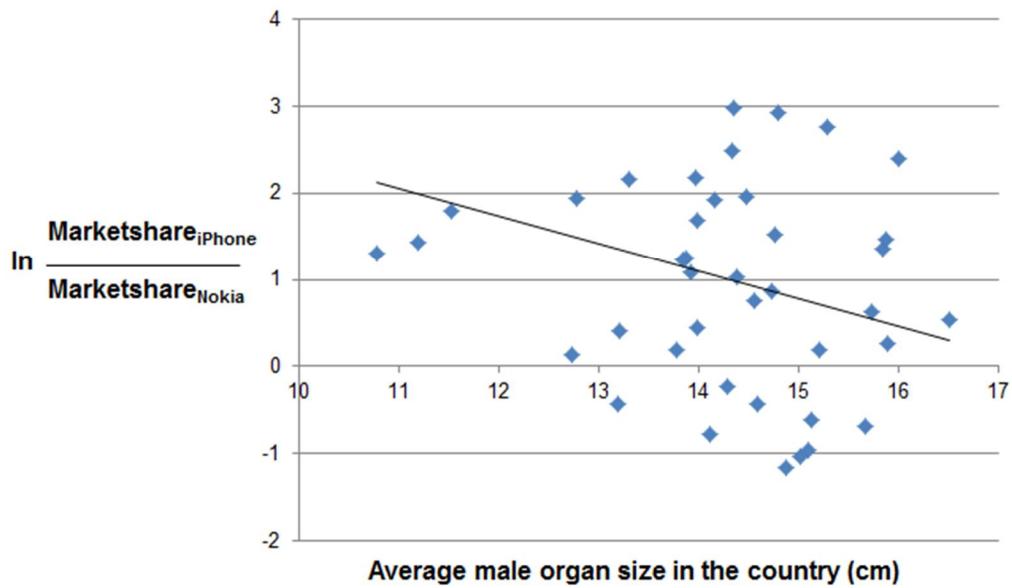


Figure B-1. The observed values of average male organ size and the market share of more vs. less prestigious smartphone brands (iPhone vs. Nokia) in the country sample