Western Cultural Identification Explains Variations in the Objectification Model for Eating Pathology Across Australian Caucasians and Asian Women

Citation for published version:
Shiyun, C, Fuller Tyszkwicz, M, Utpala, R, Yeung, V, de Paoli, T, Loughnan, S & Krug, I 2016, 'Western Cultural Identification Explains Variations in the Objectification Model for Eating Pathology Across Australian Caucasians and Asian Women', Frontiers in Psychology. https://doi.org/10.3389/fpsyg.2016.01578

Digital Object Identifier (DOI):
10.3389/fpsyg.2016.01578

Link:
Link to publication record in Edinburgh Research Explorer

Document Version:
Peer reviewed version

Published In:
Frontiers in Psychology

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Download date: 09. May. 2020
ACCULTURATION EXPLAINS VARIATIONS IN THE OBJECTIFICATION MODEL FOR EATING PATHOLOGY ACROSS AUSTRALIAN CAUCASIANS AND ASIAN WOMEN

Charmain S. Tan Shiyun¹, ², Matthew Fuller-Tyszkievicz³, Ranjani Utpala², Victoria Yeung⁴, Tara de Paoli¹, Steve Loughnan⁵, Isabel Krug¹*

¹University of Melbourne, Australia, ²National University of Singapore, Singapore, ³Deakin University, Australia, ⁴Lingnan University, Hong Kong, ⁵University of Edinburgh, United Kingdom

Submitted to Journal: Frontiers in Psychology
Specialty Section: Eating Behavior
Article type: Original Research Article
Manuscript ID: 182947
Received on: 18 Jan 2016
Revised on: 26 May 2016
Frontiers website link: www.frontiersin.org
Conflict of interest statement
The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest

Author contribution statement
CT, IK, SL, RU and MT drafted the manuscript and conceptualized the aims and hypotheses. MT conducted the analyses. IK, VY, CT, TP set up data collection. All authors provided feedback on different versions of the manuscripts. All authors read and approved the final manuscript and are accountable for all aspects of the work in ensuring that questions related to the accuracy of any part of the work are appropriately investigated.

Keywords
objectification, body shame, appearance anxiety thin-ideal internalization, eating pathology, cultural, Acculturation

Abstract
Word count: 294
Objective: To assess differences in trait objectifying measures and eating pathology between Australian Caucasians and Asian women with high and low levels of acculturation and to see if exposure to objectifying images had an effect on state-objectification. A further aim was to assess using path-analyses whether an extended version of the objectification model, including thin-ideal internalization, differed depending on the level of acculturation. Method: A total of 424 participants comprising 162 Australian Caucasians and 262 Asians (n=133 with high and n=129 with low levels of acculturation) took part in the current study. Participants were randomly allocated into one of two conditions, presenting either objectifying images of attractive and thin Asian and Caucasian female models (objectification group, n=204), or showing neutral images of objects (e.g. chairs, tables; control group, n=220). Subsequently, participants were asked to complete a series of questionnaires assessing objectification processes and eating pathology. Results: Findings revealed that the Caucasian group presented with significantly higher internalization and body surveillance scores than either of the two Asian groups and also revealed higher scores on trait-self-objectification than the low-acculturated Asian sample. Differences across the Asian groups were also revealed, with the low-acculturated Asian group presenting with higher body shame than the high-acculturated Asian group. As regards to the effects of objectifying images on state self-objectification, we found that ratings were higher after exposure to women than to control objects for each of the three acculturation groups. Finally, multi-group analyses revealed that our revised objectification model functioned equally across the Caucasian and the high-acculturated Asian groups, but differed for Caucasians and the low-acculturation Asian group. Conclusions: Our findings outline that individuals with varying acculturation levels, might respond differently to self-objectification processes. Acculturation should therefore be taken into consideration when working with women from different cultural backgrounds.

Funding statement
We don't have any funding for the study. We have therefore applied for a reduction in the processing fee, but haven't yet heard back as regards to the outcome of our application.

Ethics statement
(Authors are required to state the ethical considerations of their study in the manuscript including for cases where the study was exempt from ethical approval procedures.)

Did the study presented in the manuscript involve human or animal subjects: Yes

Please state the full name of the ethics committee that approved the study. If the study was exempt from this requirement please state the reason below.

Ethical Approval for the Current Study by obtained from University of Melbourne School of Psychological Sciences Ethics Committee

Please detail the consent procedure used for human participants or for animal owners. If not applicable, please state this.
Participants provided consent by ticking of a box indicating that they consented to take part in the current study. A tick off box was chosen, since the assessment included an online questionnaire. Participants were able to withdraw from the study at any time.

*Please detail any additional considerations of the study in cases where vulnerable populations were involved, for example minors, persons with disabilities or endangered animal species. If not applicable, please state this.*

Not applicable
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Charmain Samantha Tan Shiyun 1,2, Matthew Fuller-Tyszkwicz 3,4, Ranjani Utpala 2, Victoria Yeung 5, Tara de Paoli 1, Stephen Loughan 6, & Isabel Krug 1*

1 Melbourne School of Psychological Sciences, The University of Melbourne, VIC, Australia
2 Psychology Department, National University of Singapore, Singapore
3 Centre for Social and Early Emotional Development, School of Psychology, Deakin University, VIC,
4 School of Psychology, Deakin University, School of Psychology, Deakin University
5 Department of Applied Psychology, Lingnan University, Hong Kong
6 Department of Psychology, University of Edinburgh, Edinburgh

Word count: 7497
Number of Tables: 2
Number of Figures: 4

*Address for correspondence:
Isabel Krug, PhD, Senior Lecturer in Clinical Psychology, University of Melbourne, Psychology Clinic, 14-20 Blackwood Street, Vic 3010, Melbourne, Australia; Tel: + 61390358551;
Fax:+61393264774; e-mail: Isabel.krug@unimelb.edu.au
ABSTRACT

Objective: To assess differences in trait objectifying measures and eating pathology between Australian Caucasians and Asian women with high and low levels of acculturation and to see if exposure to objectifying images had an effect on state-objectification. A further aim was to assess using path-analyses whether an extended version of the objectification model, including thin-ideal internalization, differed depending on the level of acculturation. Method: A total of 424 participants comprising 162 Australian Caucasians and 262 Asians (n=133 with high and n=129 with low levels of acculturation) took part in the current study. Participants were randomly allocated into one of two conditions, presenting either objectifying images of attractive and thin Asian and Caucasian female models (objectification group, n=204), or showing neutral images of objects (e.g. chairs, tables; control group, n=220). Subsequently, participants were asked to complete a series of questionnaires assessing objectification processes and eating pathology. Results: Findings revealed that the Caucasian group presented with significantly higher internalization and body surveillance scores than either of the two Asian groups and also revealed higher scores on trait-self-objectification than the low-acculturated Asian sample. As regards to the effects of objectifying images on state self-objectification, we found that ratings were higher after exposure to women than to control objects for each of the three acculturation groups. Finally, multi-group analyses revealed that our revised objectification model functioned equally across the Caucasian and the high-acculturated Asian groups, but differed for Caucasians and the low-acculturation Asian group. Conclusions: Our findings outline that individuals with varying acculturation levels, might respond differently to self-objectification processes. Acculturation should therefore be taken into consideration when working with women from different cultural backgrounds.

Key words: Objectification, body shame, appearance anxiety thin-ideal internalization, eating pathology, cultural, acculturation
Objectification theory, developed by Fredrickson and Roberts (1997), proposes a formal framework that allows incorporation of both sociocultural (including media influences) and psychological risk factors, and their interactions with eating pathology. The literature has also advocated for the inclusion of internalization of the media ideal as preceding self-objectification, however studies incorporating this variable have been scarce (Moradi, & Huang, 2008). Most of the studies supporting the model have been correlational and only more recently have studies established growing support for the model using experimental designs (Harper, 2008) or structural equation modelling (SEM) and/or path-analyses (Dakanalis et al., 2015a,b; Tiggemann, & Williams, 2012). Moreover, cross-cultural validation of the objectification model using these designs have been extremely limited (Kim et al., 2014), and the extent to which participants had acculturated to western ideals was not directly measured in the few cultural studies, even though it would likely impact the effects of ethnicity on objectification-related outcomes (Doris et al., 2015). The present study assessed, for the first time, within an Australian and Hong Kong context, differences across three acculturation groups (Caucasians, high-acculturated Asians and less-acculturated Asians). It should be noted that the cultural norms in Australia and Hong Kong (given that it used to be a British colony), aligns with the thin ideal in other western cultures (Jennings et al., 2006; Lai et al., 2013); and that Australia has a high proportion of Asian heritage individuals. In specific the current study will assess differences across the three acculturation groups in trait objectification processes and eating pathology and will use an experimental design to investigate whether exposure to objectifying media images had an effect on state-objectification in these three groups. Additionally, this study assessed, using path-analyses, whether a revised version of the objectification model, including thin-ideal internalization, varied depending on the level of acculturation of the participants.

Objectification theory (Fredrickson & Roberts, 1997) asserts that women, through gender socialization and repeated experiences of sexual objectification (e.g., sexual harassment, exposure to media that objectify women), begin to take on an observer’s perspective of their body, and perceive and consider themselves as objects to be judged based on appearance (i.e., they self-objectify). Self-objectification is characterized by habitual monitoring of one’s outward appearance. The literature further distinguishes between state and trait self-objectification. The former refers to self-objectification that occurs as a consequence of an objectifying encounter or within a specific context (e.g., experimentally induced), while the latter relates to intrapersonal characteristics, which tends to be more stable, though in this instance, is still influenced by longstanding socialization processes (Moradi, & Huang, 2008). Self-objectification is the primary component of the objectification model, and the mechanism by which exposure to a cultural environment that encourages objectification of women results in psychological problems.

More recently, the literature has advocated for the inclusion of internalization as preceding self-objectification (Dakanalis et al., 2014; Moradi, & Huang, 2008; Tiggemann, 2013). Internalization of the media ideal refers to the extent an individual endorses and engages in behaviours which helps them to abide by societal archetypes of attractiveness (Harrison et al., 2006). While most women in westernized countries are exposed to the pervasive thin-ideal female form and the pressure to conform, not all of them go on to experience adverse
psychological outcomes. It has been argued that the adoption of cultural standards of beauty (i.e., internalization) is a key mediating variable between exposure to sexual objectification and self-objectification, psychological issues and maladaptive eating patterns, and should therefore be included in future objectification studies (Moradi, & Huang, 2008). Figure 1 outlines the objectification model, including thin-ideal internalization, as it relates to eating pathology.

Correlational studies of the objectification model (with or without internalization) have found relationships between self-objectification processes and levels of eating disorder symptoms across a variety of population types, including adolescents (Slater & Tiggemann, 2010), young females (Dakanalis et al., 2013, 2016), older women (Augustus-Horvath & Tylka, 2009), physically active women (Greenleaf & McGrer, 2006), women with eating disorders (Calogero et al., 2005), deaf women (Moradi, & Rottenstein, 2007), lesbian women (Kozee & Tylka, 2006) and heterosexual and gay men (Dakanalis et al., 2012; Engeln-Maddox et al., 2011).

In the few comparative studies between Caucasian and Asian women, Frederick and colleagues (Frederick et al., 2006; 2007), reported equal levels of body surveillance, but greater body dissatisfaction in Asian compared to Caucasian women, once body mass index (BMI) was statistically controlled. However, despite differences in body dissatisfaction, there was a similar body surveillance-body dissatisfaction relationship across both groups. Another study comparing Caucasian and Asian women revealed that self-objectification was related to body shame and surveillance in both groups, despite higher trait self-objectification, body surveillance and body shame scores in the Caucasian group (Claudat et al., 2012). Therefore, these studies suggest that the relationships conceived within the objectification model might be similarly applicable to Asian women, however further experimental studies and research using more advanced statistical procedures such as SEM and/or path modelling in cultural diverse samples are required to verify these initial findings.

To date, experimental studies that have tested the effect of objectifying media images on state self-objectification have been relatively scarce. One of the key studies in this area, elicited state self-objectification by exposing women to advertisements taken from fashion magazines marketed towards young adult women (Harper & Tiggemann, 2008). Those in the control condition were shown images featuring products without people, while those in the two experimental groups were shown images containing thin women with or without attractive men and four images from the control condition. The researchers found that women from the experimental groups had greater state self-objectification, weight related appearance anxiety, negative mood states, and body dissatisfaction compared to individuals who viewed the control images. However, no differences were identified across conditions for non-weight-related appearance anxiety. Aubrey and colleagues (2009) similarly investigated the impact of showing images of female models with high skin exposure, women’s body parts or models with low skin exposure on self-objectification and criterion variables. They found that participants in the high skin exposure condition used more negative words to describe their appearances and had greater state self-objectification relative to the other conditions. To our knowledge there is no study that has assessed the effect of media images on state self-objectification in a culturally diverse sample. Further cross-cultural experimental research in this area is therefore required.
Recent studies have incorporated SEM and/or path-analyses in their analyses, enabling simultaneous assessment of all of the relationships within the objectification model (Calogero, & Pina, 2011; Dakanelis et al., Tiggemann, & Williams, 2012; Tylka, & Sabik, 2010). Most of these studies have found support for the pathways within the objectification model. In a comprehensive test of the objectification model using SEM, Tiggemann and Williams (2012), found a sufficient fit of the model within a primarily white female population. Significantly, the model accounted for 93% of the variance in predicting eating disorder symptoms, with both body shame and appearance anxiety as major mediators. Additionally, past studies have also used SEM to demonstrate the role of internalization in contributing to body image disturbances and subsequently, eating pathology (Kozee & Tylka, 2006; Moradi et al., 2005; Tylka, & Subich, 2004). However, there appears to be only one study exploring the applicability of the objectification model in an Asian population (Kim et al., 2014) living in their home country. In college age Asian-born South Korean women, internalization, body surveillance, and body shame were found to mediate the relationship between media exposure and maladaptive eating (Kim et al., 2014). This provides support for the generalizability of the objectification model to a South Korean cohort, and raises the possibility that the model could be extended to other Asian populations as well. However, a limitation of this study was that the sample assessed might have varied considerable as regards to having adapted to the western cultural ideal, which could have been accounted for by assessing level of acculturation to western culture.

Acculturation has been defined as the process of psychosocial change that transpires as the dominant society’s cultural values, language, norms, and behaviours such as the western ideal of beauty, are acquired (Alvidrez et al., 1996). It is possible that Asian women experience changes in terms of their body image and eating behaviours when they become more acculturated to the Western cultural norms. Thus far, research on the links of acculturation with body image and eating disorder symptoms has produced mixed findings, with a recent systematic review (Doris et al., 2015) on the topic, outlining that both higher and lower acculturation levels have been identified as risk factors for the development of eating disorders in Asian women (Doris et al., 2015). The same review also outlined that these inconsistent findings could partially be explained by the different acculturation measures employed in the studies reviewed. Further research on acculturation in relation to the objectification model in cross-cultural studies using validated acculturation measures assessing various components of acculturation (e.g. language, identity, friendships, behaviours, generation background and attitudes) are therefore needed (Suinn et al., 1992).

To conclude, existing research examining objectification theory tenets has largely used convenience samples of white, upper middle class, undergraduate women. Thus, there continues to be limited experimental research and SEM and/or path analyses studies in ethnically and culturally diverse sample. Research has also highlighted the relationship between internalization and various factors within the objectification model. However, despite this association, the inclusion of internalization in objectification theory research continues to be limited across SEM and/or path-analysis studies. Finally, no study to date has assessed the role of acculturation on the model when assessing individuals from different cultural and ethnic backgrounds. However, including acculturation into the model is important, as it might explain differences between the objectification theory constructs and/or relationships, further increasing our understanding of the
model across cultures. Consequently, it may also allow for more efficacious preventive measures and interventions techniques to reduce the risk of eating disorders in other cultures.

The present study aimed to integrate culture into the objectification framework for eating pathology among Caucasian Australians and high and low-acculturated Asians. More specifically, we aimed to partially replicate Harper and Tiggemann’s (2008) research by assessing the effect of objectifying images (thin-ideal Caucasian and Asian women), compared to neutral pictures (chairs, tables), on ratings of state-self objectification and to assess what impact acculturation played in both state and trait objectification processes and eating pathology. Hence, our aims were threefold: 1.) to assess differences across trait-level variables (appearance anxiety, body shame, surveillance, trait self-objectification and eating pathology), across three acculturation groups including Caucasians, high-acculturated Asians and low-acculturated Asians; 2.) to examine the effect of objectifying images on state self-objectification across these three acculturation groups; and 3.) to undertake multi-group path modelling to explore whether a (revised) objectification model, including thin-ideal internalization, differed across the three groups (see Figure 1). Internalization was added to the model since it would further aid us in understanding the objectification model and it would also provide clarification of posited acculturation group differences.

MATERIAL AND METHODS

Sample

The sample included 424 Asian and Caucasian women between the ages of 17 to 48 years, \((M=19.72, \ SD=3.72)\), who were recruited from a University in Australia \((n=345)\) and a university in Hong Kong \((n=79)\). Study eligibility criteria included being female, and of either Asian or Caucasian descent. Of the participants, 38.2\% \((n=162)\) were Caucasian women with Australian citizenship, 20.8\% \((n=88)\) were Asian women with Australian citizenship, 22.4\% \((n=95)\) were Asian women without Australian citizenship, but were in Australia for educational purposes, and 18.6\% \((n=79)\) were Asian women from Hong Kong. The mean body mass index (BMI) of the overall sample was 21.15 kg/m\(^2\) \((SD=3.21)\).

Design

An experimental between-subjects design was used to assess the impact of objectifying images on the variables in the objectification theory. Participants were randomly allocated into one of two conditions, one presenting 40 objectifying images of both attractive and thin Asian and Caucasian female models (objectification group), while the other showed 40 neutral images of objects (control group). Half of the total sample \((n=204)\) were in the objectification group while the other half \((n=220)\) were in the control group.
Choice of images

The images of women were generated with an online search using descriptors related to sexual objectification (e.g. “attractive”, “thin”, “objectification”, “sexy”, “Asian”). Each picture chosen portrayed a thin-ideal woman, who looked either Asian or Caucasian, in sexualized and/or objectified manners (e.g. postures which emphasized body parts, clothed in revealing garments, poses which portrayed sexual desire or interest). Attempts were made to avoid images of celebrities, which might result in greater attention or other inadvertent biases not present within the other stimulus. The initial pool of images was reduced to 20 Asian women and 20 Caucasian women by a group of female volunteers (N=10). They were asked to rate how attractive the images within each set were using a five-point Likert scale (1=Unattractive; 5=Attractive). Images with the highest ratings were chosen for use in the experiment. The pictures of objects were selected using a similar process, changing only the keywords used (e.g. “accessories”, “home ware”).

Measures

Demographics: Information on age, country of birth, years lived in Australia, ethnicity, weight, and height were obtained. BMI was subsequently calculated as the ratio of weight (kg) to height squared (m²).

State self-objectification: A shortened version of the Twenty Statements Test [TST; (Fredrickson et al., 1998)] was used to assess experimentally heightened changes in self-objectification. Participants were asked to describe themselves by completing ten sentences about their identity that begin with the phrase “I am”. Responses were coded by two raters (C.T and T.P.) and categorised into six categories: (a) body shape and size, (b) other physical appearance, (c) physical competence, (d) traits or abilities, (e) states or emotions and (f) uncodable or illegible. Scores were derived by summing up the number of responses from the two appearance-related categories (i.e., a and b). Scores ranged from 0 to 10 with higher scores indicative of greater state self-objectification. The second coder (T.P.) coded a random sample of the statements, with a 97.6% agreement to the original ratings as to the responses either being appearance- or not appearance-based.

Trait self-objectification: There are two common methods of operationalizing trait self-objectification within the literature. One approach is through the Body Surveillance subscale from the Objectified Body Consciousness Scale [OBCS; (McKinley & Hyde, 1996)], which is behavioural in nature as it assesses level of reported habitual body monitoring. The other is via the Self Objectification Questionnaire [SOQ; (Noll & Fredrickson, 1998)], which looks at the cognitive component of self-objectification, comparing participants’ perceived importance of appearance- versus competence-based body attributes. Currently, it remains unclear if the Body Surveillance subscale and SOQ assess distinct or overlapping or similar construct(s). As such, researchers (Moradi, & Huang, 2008) have argued for the use of both to address the process of self-objectification more comprehensively.
**Body surveillance:** The Body Surveillance subscale, taken from the OBCS (McKinley & Hyde, 1996), evaluates the extent to which individuals monitor their bodies as an observer and think about their bodies in terms of how it looks. There are 8 items (e.g., “I rarely compare how I look with how other people look”) on a 7-point Likert scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). Scores were averaged, with higher scores illustrating more time expended on self-monitoring and greater concern for outward appearances. In previous studies, Cronbach's alphas have ranged from .76 to .89 with a test-retest reliability of .79 (McKinley & Hyde, 1996). The internal consistency in this study was .82.

**Trait self-objectification:** The SOQ (Noll & Fredrickson, 1998) assesses the extent to which participants have a primarily appearance-based versus competence-based self-concept. In the current study, participants were asked to rank 10 attributes in order of how important the parts were to their self-concept (with 1 being most important and 10 being least important). Scores were obtained by summation of the ranks within the appearance and competency items, and computing the difference of appearance from competency. Scores ranged from -25 to 25, with higher scores indicative of the greater importance of appearance, which was interpreted as higher trait self-objectification.

**Body shame:** The Body Shame subscale from the OBCS (McKinley & Hyde, 1996) assesses the level of guilt an individual experiences for not attaining the cultural standard (e.g., “I feel ashamed of myself when I haven't made the effort to look my best”). It consists of 8 items, with ratings based on a 7-point Likert scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). Scores were derived by averaging the responses given, with higher scores indicative of greater body shame. In a previous study, a two-week test-retest reliability of .79 and internal consistencies ranging from .70 to .84 were reported (McKinley & Hyde, 1996). Cronbach’s alpha in the current sample was .81.

**Appearance anxiety:** This was measured using the brief version of the Appearance Anxiety Scale (Dion et al., 1990), which assesses preoccupation with observable aspects of the physical self and body image assessment. Respondents reported the extent to which each of 14 statements (e.g., “I get nervous when others comment on my appearance”) were true of them (0 = never; 4 = almost always). Scores were achieved by summation, with higher scores demonstrating higher anxiety about one’s appearance. A previous study reported the internal consistency to be .86, with a test-retest reliability of .89 (Dion et al., 1990). In the present study, the scale had an internal consistency of .90.

**Internalization of media ideals:** The Internalization subscale from the Sociocultural Attitudes Towards Appearance Scale-3 [SATAQ-3 (Thompson et al., 2004)] was administered to assess the internalization and acceptance of societal pressure to be thin and attractive. It consists of 9 items (e.g., “Women who appear in TV shows and movies project the type of appearance that I see as my goal”) and participants respond on a Likert scale ranging from 1 (completely disagree) to 5 (completely agree). Scores were obtained by averaging item responses, with higher scores representative of greater internalization. A previous study reported Cronbach's alpha of .92 (Thompson et al., 2004). Within the current sample, it had an internal consistency of .93.
Eating Pathology: The Eating Attitudes Test [EAT-26 (Garner et al., 1982)] was used to determine the level of disordered eating attitudes and behaviours in participants. It is a widely used screening tool consisting of 26-items on a 6-point Likert scale ranging from Always to Never. These items were designed to measure level of dieting, bulimia and food preoccupation, as well as oral control. Dieting was measured by 13 items (e.g., “Am preoccupied with a desire to be thinner”); bulimia and food preoccupation by 6 items (e.g., “Have gone on eating binges where I feel that I may not be able to stop”); and oral control by 7 items “Display self-control around food”. The EAT-26 has excellent psychometric properties with reliability coefficients ranging between .70 and .88 (Garner et al., 1982). Cronbach’s alpha for the overall EAT-26 scores in the current sample was .86.

Acculturation: The Suinn-Lew Asian Self-Identity Acculturation Scale (Suinn et al., 1992) is a 21-item scale that assesses different levels of acculturation, including language, identity, friendships, behaviours, generation background and attitudes. A higher composite score reflects greater western identification (i.e., high-acculturation), whereas a lower composite score is indicative of greater identification with Asian culture (i.e., low-acculturation). To examine if and how acculturation level in Asian participants impacted the objectification model, Asian respondents were categorized into two groups (high- and low-acculturation), with 133 participants in the former and 129 in the latter. This was achieved by conducting a median-split on the composite score of the acculturation scale. Reliability of the scale was reported as ranging from .88 to .91 (Suinn et al., 1992). Cronbach’s alpha in this study was .97.

Procedure

The study was administered online via Qualtrics. At the start of the study, participants read and signed a consent form informing them of the voluntary nature of the study, before completing the demographic questions. Next, participants were briefed that they would be viewing a slideshow of 40 images. Allocation into the condition was randomized by Qualtrics, based on when they began the study and self-selected ethnicity (Asian or Caucasian). The latter was done to ensure roughly equal representation of both groups across the experimental and control conditions. Participants were encouraged to attend to the images, and informed that they would be asked about them later in the study. Forty pictures of either objectified women or control were shown, one at a time, for three seconds each. Once the slideshow was completed, a battery of questionnaires assessing the variables in the objectification framework, eating pathology and acculturation was administered.

Statistical Analyses

All descriptive and group-difference based analyses were conducted using IBM SPSS 20.0, whereas path-analyses were conducted in Mplus. Between group analyses (using t-test, chi-square, and one-way ANOVAs, as appropriate) of the sociodemographic factors were done to identify differences between women across acculturation levels (Caucasian versus high-acculturated Asian vs low-acculturated Asian participants). MANOVA analyses were used to assess the impact of acculturation level on trait self-objectification, internalization, body surveillance, body shame, appearance anxiety, and maladaptive eating behaviours. A 2 x 3
ANOVA was undertaken to evaluate the moderating effect of acculturation levels on the relationship between images viewed (objectifying versus control) and state self-objectification.

Finally, a series of multi-group path-analyses were undertaken to test the model shown in Figure 1. As we were interested in the possibility that the Caucasian group differed from the other two groups, separate analyses were undertaken to compare Caucasian vs low-acculturation Asian participants and Caucasian vs high-acculturation Asian participants. In both of these comparisons, model parameters were set to be equal across groups (e.g., the relationship between internalization and appearance anxiety was forced to be of equal magnitude for the Caucasian and low-acculturation groups), and model fit was compared against a saturated model (since the model with parameters freely estimated across groups consumed all degrees of freedom).

Standard cut-offs were used to evaluate acceptable model fit for the model in which parameters were constrained to equality: non-significant chi-square value, Comparative Fit Index (CFI) >.95, Root Mean Square Error of Approximation (RMSEA) <.06, and Standardized Root Mean Square Residual (SRMR) <.08 (Byrne, 2012; Hu & Bentler, 1999). As the model in which parameters were allowed to vary across groups was saturated (i.e., chi-square = 0, df = 0, CFI = 1, RMSEA = 0, and SRMR = 0), fit statistics are not reported for this model. As a consequence, the models were concluded to be different across groups if chi-square for the constrained model was significantly different from zero (Byrne, 2012). Standardized coefficients are reported in text. Studies have identified age and BMI as potential covariates of eating disorder constructs (Augustus-Horvath & Tylka, 2009). In order to provide a more stringent test of the hypotheses, age and BMI were therefore added as covariates in the path models.

RESULTS

Sociodemographics

The sociodemographic variables for the overall sample, Caucasian, high-acculturated Asian group, and low-acculturated Asian group are presented in Table 1. Significant group differences were observed for BMI ($p < .001$), but not for age ($p = .104$). The low-acculturated Asians ($p < .001$) and the high-acculturated Asians ($p = .001$) had lower BMI compared to Caucasian women. There were no significant differences between the two Asian groups ($p = .597$) for BMI. Distribution of participants across the education level categories (secondary, tertiary, and postgraduate) differed significantly between the three acculturation groups ($p < .001$), with both the low- and high-acculturation groups tending to have a higher proportion of participants completing tertiary studies than the Caucasian group, and this proportion was greater for the low-acculturation than high-acculturation group.

--- Insert table 1 about here ---
The impact of acculturation on trait measures from the objectification theory

Table 2 provides a breakdown by group of acculturation of means for each of the trait variables from the objectification theory. Across most variables, Caucasian participants reported more extreme levels for each of the study variables, followed by the high-acculturation group, and then the low-acculturation group. A MANOVA was conducted to evaluate acculturation-related differences in the trait variables from the objectification theory, and found a significant multivariate effect for acculturation group; $F(12, 834) = 4.20, p < .001, \eta_p^2 = .057$. As detailed in Table 2, significant univariate effects were observed for: (1) trait self-objectification – the low-acculturated group had significantly lower levels of objectification than the Caucasian group; (2) body surveillance – the Caucasian group reported higher levels of body surveillance than either of the Asian subgroups, and the high acculturation group had higher levels of body surveillance than the low acculturation group; and (3) internalization - the Caucasian group reported higher levels of internalization than either of the Asian subgroups.

The impact of image type and acculturation on state self-objectification

A 2 x 3 factorial ANOVA was conducted using image type (objectification, control) and acculturation (Caucasian, high-acculturated Asian, low-acculturated Asian) as the independent variables, and state self-objectification as the dependent variable. A significant main effect of image type, $F(1, 418) = 10.64, p = .001, \eta_p^2 = .025$ was present, with higher state self-objectification for images of women ($M = 1.01, SD = 1.16$) than for objects ($M = .65, SD = .99$). The main effect for acculturation was borderline significant, $F(2, 418) = 3.43, p = .051, \eta_p^2 = .022$. Pairwise comparisons showed that the low acculturation group had significantly higher state self-objectification ($M = 1.02, SD = 1.11$) than the Caucasian group ($M = .73, SD = 1.03; p = .021$), but the high acculturation group ($M = .76, SD = 1.11$) did not significantly differ from the low acculturation group ($p = .060$) or the Caucasian group ($p = .736$). There was no interaction effect, $F(2, 418) = 1.30, p = .273, \eta_p^2 = .006$.

Comparing the revised objectification theory model across groups of acculturation

Multi-group path analyses showed that the proposed, objectification theory model functioned equivalently across Caucasian and high-acculturation groups [$\chi^2$ square ($df = 25$) = 27.73, $p = .320$; CFI = .996, RMSEA = .027, SRMR = .058], but differed for Caucasian and low-acculturation groups [$\chi^2$ square ($df = 25$) = 64.92, $p < .001$]. Unsurprisingly, fit for the model in which Caucasian and high-acculturation groups were constrained to equality was acceptable (CFI = .996, RMSEA = .027, SRMR = .058), but poor for the model constraining Caucasian and low-acculturation groups to equality (CFI = .939, RMSEA = .105, SRMR = .148).

Caucasian group

As shown in Figure 2.a., for the Caucasian group, eating pathology was significantly predicted by appearance anxiety ($\beta = .30, p = .012$, two-tailed), body shame ($\beta = .44, p < .001$), body surveillance ($\beta = -.34, p = .008$), and internalization ($\beta = .25, p = .028$). Appearance anxiety was
significantly predicted by body surveillance ($\beta = .52, p < .001$) and internalization ($\beta = .19, p = .034$). Body shame was significantly predicted by body surveillance ($\beta = .53, p < .001$). Trait self-objectification and body surveillance were both predicted by internalization ($\beta = .45, p < .001$, and $\beta = .71, p < .001$, respectively). Appearance anxiety co-varied with body shame ($\beta = .46, p < .001$), and trait self-objectification co-varied with body surveillance ($\beta = .29, p < .001$).

Internalization had several significant indirect effects on eating pathology, body shame, and appearance anxiety: (1) internalization $\rightarrow$ body surveillance $\rightarrow$ eating pathology, $\beta = .24, p = .009$; (2) internalization $\rightarrow$ body surveillance $\rightarrow$ body shame $\rightarrow$ eating pathology, $\beta = .17, p = .001$; (3) internalization $\rightarrow$ body surveillance $\rightarrow$ appearance anxiety $\rightarrow$ eating pathology, $\beta = .16, p = .017$; (4) internalization $\rightarrow$ body surveillance $\rightarrow$ appearance anxiety, $\beta = .37, p < .001$; and (5) internalization $\rightarrow$ body surveillance $\rightarrow$ body shame, $\beta = .38, p < .001$. In total, 37% of the variance in eating pathology, 58% of the variance in appearance anxiety, 53% of the variance in body surveillance, 41% of the variance in body shame, and 22% of the variance in trait self-objectification were accounted for by predictor variables (including the covariates) in the model.

**High-acculturated Asian group**

For the high-acculturation Asian group (see Figure 2.b.), eating pathology was significantly predicted by appearance anxiety ($\beta = .27, p = .004$), body shame ($\beta = .36, p < .001$), and trait self-objectification ($\beta = .27, p = .005$). Appearance anxiety was significantly predicted by body surveillance ($\beta = .29, p = .005$) and internalization ($\beta = .20, p = .023$). Body shame was significantly predicted by body surveillance ($\beta = .37, p = .002$). Trait self-objectification and body surveillance were both predicted by internalization ($\beta = .47, p < .001$, and $\beta = .61, p < .001$, respectively). Appearance anxiety co-varied with body shame ($\beta = .47, p < .001$), and trait self-objectification co-varied with body surveillance ($\beta = .35, p < .001$).

Internalization had several significant indirect effects on eating pathology, body shame, and appearance anxiety: (1) internalization $\rightarrow$ trait self-objectification $\rightarrow$ eating pathology, $\beta = .13, p = .006$; (2) internalization $\rightarrow$ body surveillance $\rightarrow$ body shame $\rightarrow$ eating pathology, $\beta = .08, p = .006$; (3) internalization $\rightarrow$ body surveillance $\rightarrow$ appearance anxiety, $\beta = .17, p = .009$; and (4) internalization $\rightarrow$ body surveillance $\rightarrow$ body shame, $\beta = .22, p = .009$. 35% of the variance in eating pathology, 38% of the variance in appearance anxiety, 38% of the variance in body surveillance, 27% of the variance in body shame, and 23% of the variance in trait self-objectification were accounted for by predictor variables (including the covariates) in the model.

**Low-acculturated Asian group**

For the low-acculturation Asian group (see Figure 2.c.), eating pathology was significantly predicted by appearance anxiety ($\beta = .21, p = .040$), and internalization ($\beta = .19, p = .048$). Appearance anxiety was significantly predicted by trait self-objectification ($\beta = .17, p = .012$) and body surveillance ($\beta = .34, p < .001$). Body shame was significantly predicted by body surveillance ($\beta = .26, p = .002$) and internalization ($\beta = .31, p < .001$). Trait self-objectification and body surveillance were both predicted by internalization ($\beta = .38, p < .001$, and $\beta = .48, p < .001$, respectively). Appearance anxiety co-varied with body shame ($\beta = .45, p < .001$), and trait self-objectification co-varied with body surveillance ($\beta = .25, p = .002$).
Internalization had several significant indirect effects on body shame and appearance anxiety, but not for eating pathology: (1) internalization → trait self-objectification → appearance anxiety, $\beta = .07, p = .029$; (2) internalization → body surveillance → appearance anxiety, $\beta = .16, p = .001$; and (3) internalization → body surveillance → body shame, $\beta = .12, p = .006$. In total, 25% of the variance in eating pathology, 34% of the variance in appearance anxiety, 22% of the variance in body surveillance, 29% of the variance in body shame, and 14% of the variance in trait self-objectification were accounted for by predictor variables (including the covariates) in the model.

DISCUSSION

Our findings revealed significant differences in trait objectification measures across the three acculturation groups, with the Caucasian group presenting with significantly higher internalization and body surveillance scores than either of the two Asian groups and they also revealed higher scores on trait-self-objectification than the low-acculturated Asian sample. As regards to the experimental component of the study, we found higher scores in the group that viewed the thin-ideal images of women compared to the control group in all three acculturation groups, indicating that our exposure was successful in eliciting state self-objectification, but that this effect generalized across cultural groups. Finally, our revised objectification model, including thin-ideal internalization was equivalent across the Caucasian and the high-acculturated Asian group, but differed across the Caucasian and the low-acculturated Asian individuals. Each of these findings will be discussed in more detail in the subsequent sections.

Main effect of acculturation on the assessed trait variables

Greater trait self-objectification, internalization and body surveillance were demonstrated in Caucasian women compared to Asian women, particularly the low-acculturated ones. This is in line with previous findings, which have found that Asian American women had less internalization, lower trait-objectification levels and lower body surveillance compared to Caucasian Americans (e.g. Claudat et al., 2012; McKenney & Bigler, 2016).

A further important finding was that there were no differences in disordered eating scores across the acculturation groups. This finding is consistent with previous findings, in which Asian American (Nouri, et al., 2011; Marques et al., 2011), and Australian women (Jennings et al., 2006) demonstrated comparable levels of weight concerns, the use of unhealthy weight control behaviours and eating pathology compared to Caucasian women, but contradicts the findings of other studies, which found higher eating pathology in Asian females (Jennings, et al., 2005) compared to Caucasian Australians. Future studies are therefore required to disentangle these contradictory findings.
Impact of exposure to media images and acculturation on state-self-objectification

As regards to the experimental aspect of the current study, we found that state self-objectification was higher in the group viewing objectifying images compared to the control group, suggesting that objectifying images were effective in inducing self-objectification. This finding is consistent with the findings of other studies (Aubrey et al., 2009; Harper & Tiggemann, 2008), which also found greater state self-objectification, weight related appearance anxiety, negative mood states, and body dissatisfaction, in response to viewing objectifying images. However, it should be noted that we were only able to assess state self-objectification in this experimental part of the study, given that the other measures were all trait-based. Future studies should include a range of state-related objectification and disordered eating measures to extend our findings.

Even though an interaction between the exposure group (objectifying versus control) and the acculturation group was not revealed, we found that the low-acculturation Asian group exhibited the highest state self-objectification ratings after exposure to images of women. This finding could be attributable to the fact that perhaps the low-acculturated Asian group had fewer opportunities to be exposed to the Western thin ideal, resulting in a more detrimental influence of these images in this group.

Comparing the revised objectification theory model across groups of acculturation

Despite some differences between the aforementioned variables across acculturation, invariance testing indicated that the objectification model was largely equivalent between Caucasians and high-acculturated Asian women, but differed significantly between the Caucasians and the low-acculturated Asian group. Consistent with previous studies (e.g. Calogero, & Pina, 2011; Kim et al., 2014; Tiggemann, & Williams, 2012), this suggests that the objectification model may be used to explain and understand maladaptive eating development for highly acculturated Asian women. Furthermore, these results are congruent with the literature, which highlights similar risk factors in the development of eating disorders between highly acculturated Asian and Caucasian females (Pike & Dunne, 2015).

A closer look at the revised model also highlighted several areas of interest that may add to the understanding of the objectification theory in different acculturation groups. First, the variance explained in these outcome measures tended to be lower for the low-acculturation group, suggesting that in addition to differences in mean levels for these objectification variables, their associations may also differ across cultures. Second, the indirect effects of internalization on key outcomes (body shame, appearance anxiety, and eating pathology) differed across groups (especially for the low acculturation group relative to the other two groups). The key indirect effects can be summarised as follows: 1.) body surveillance mediated the internalization-appearance anxiety and internalization-body shame relationships for all three groups; 2.) the internalization-eating pathology relationship was not mediated by any variables for the low acculturation group, but was mediated by several variables for the other two groups (body surveillance and shame for both groups, trait self-objectification for the high acculturation group only and appearance anxiety for the Caucasian group only).
The mediating role of body shame and appearance anxiety in the links between internalization of cultural standards of beauty and body surveillance with eating pathology has been supported with young and adult women (e.g., Calogero et al., 2010; Dakanalis et al., 2015a; Rolnik et al., 2010). Furthermore, the finding that internalization acts as an antecedent to the objectification model, is congruent with previous research that highlighted both the direct and indirect unique contribution of internalization to the various self-objectification measures and eating pathology (Calogero et al., 2005; Dakanalis et al., 2015b; Moradi et al., 2005; Myers & Crowther, 2007; Sinclair, 2005).

The main differences between the Caucasian and the high-acculturated Asian group, was that internalization had an effect through trait self-objectification on eating pathology, only in the high-acculturated Asian group. This finding could implicate again that given that the high-acculturated Asian females had possibly less exposure to objectifying images than the Caucasians, they might have been more affected by these images. Despite the growing body of literature that supports trait self-objectification and body surveillance as being notionally different terms, they continue to be broadly regarded as interchangeable in most research (Tiggemann, & Williams, 2012). The current findings therefore provide further grounds for assessing these two objectification variables separately in future studies (Calogero et al., 2005; Moradi, & Huang, 2008).

Conversely, for the low-acculturated Asian group, few significant pathways were revealed for the overall model, with the no significant indirect pathway being found from internalization to eating pathology. It is possible that the low-acculturated Asian group might have had certain protective factors, which prevented them from experiencing the negative psychological consequences of self-objectification, for instance, that these women were enculturated to their heritage culture (Pike & Dunne, 2015; Sussman et al., 2007) or they might have adopted an integration style of acculturation, accepting the identity of both cultures and therefore experienced less stress and subsequently less exposure to risk factors for eating pathology (Doris et al., 2015). Finally, it is also possible that the traditional Asian conceptualization of ideal female beauty emphasizes other body parts (e.g. face) rather than the body. Accordingly Kim and colleagues (2014) found that face size and shape was one of the most important factors in the modified objectification model, tested in a South-Korean sample. Furthermore, research has shown that amongst Asians, there is relative homogeneity in terms of BMI variance (Bélanger et al., 2010) and therefore it is likely that these women may have developed a stronger preference to differentiate each other through other body parts (e.g. facial features). Further research is required to further assess all of these potential explanations.

Finally, it is also worth mentioning that in both the Caucasian and the low-acculturated Asian groups, but not the high-acculturated Asian group, thin ideal internalization had a direct effect on eating pathology. This finding is in agreement, with previous findings, outlining that the adoption of cultural standards of beauty (i.e., internalization) has direct detrimental effects on eating pathology (Dakanelis et al., 2013, 2016; Stice, 2002). However, what remains of interest for future studies to explore, is why this direct relationship was not observed in the high-acculturated Asian group.
Limitations

The present findings should be considered in light of a number of study limitations. A limitation of the current study is the reliance on undergraduate participants, which is a limiting characteristic of most experimental research in this field. The cross-sectional and correlational nature of the data does not allow for strong causal inferences from the study’s results. Furthermore, participants filled in the questionnaire-based measures after having seen the objectifying or neutral images to replicate the original experimental studies in this area (Aubrey et al., 2009; Harper & Tiggemann, 2008). This ordering of manipulation and measurement could have had an effect on the participants’ responses. A better design would have entailed a pre-post design, but given the extensive number of measures included in the current study this would have been too burdensome for the participants. We did however, carefully consider our measures and made sure that with the exception of state self-objectification, all other measures were trait based. Hence, it seems unlikely that the trait measures might have been impacted by the images previously seen. Another consideration is that our Asian group was used as a homogenous sample in this study, despite being made up of various ethnic subgroups from various countries (e.g., Hong Kong, China, Singapore, Malaysia, Indonesia, and Korea). Although this adds breadth, important group differences might have been overlooked. It should also be considered that the group from Hong Kong was not living in Australia, however, given that Hong Kong used to be a British colony we assumed that individuals there would be exposed to a similar Western ideal as in Australia. Finally, it should be noted that the path-analysis approach we used, assumed that the constructs included in the assessed model functioned equally across the Caucasian and the two Asian groups. Future studies would benefit from using a multi-group Confirmatory Factor Analysis (CFA) framework, to explicitly test such an assumption. Regardless of these limitations, the current study is of great significance as it is the first study of objectification that comprised a large sample of Asian and Caucasian participants and took for the first level of acculturation into consideration.

Implications

The findings of the current study have substantial implications for future eating disorder prevention and intervention endeavours. Preventive strategies, regardless of the ethnic background and level of acculturation, would benefit from identifying women evidencing high thin-ideal internalization and body surveillance and design prevention efforts targeted to these objectification processes. Such programmes might involve psychoeducation of realistic body shapes and sizes, the negative impact of consuming media that objectify women and increasing awareness of the pervasiveness of sexual objectification of women and its implications. Interventions would also benefit from emphasizing individuals’ internal qualities and to provide embodied experiences. Cognitive dissonance-based prevention programs already do this by including behavioural activities whereby participants speak or write positively about their bodies, including their bodies’ physical, emotional, intellectual, and social qualities (Becker et al., 2013).
Furthermore, our findings indicated that the development of eating pathology might differ within the broader context of the objectification model across women of varying acculturation levels. For example, for Asian women who are more acculturated to western cultures, overvaluation of their appearance is more likely to result in maladaptive eating behaviours and attitudes, compared to less acculturated Asian women. Therefore, for the former population, it may be important to focus on distorted cognitions related to the magnified importance of appearances in the development of preventative strategies, early interventions or treatment. As such, it may be relevant to consider acculturation levels or acculturation-related stressors during assessment.

Conclusions

To conclude, our study highlights that objectification theory provides a suitable framework to explore the development of eating pathology in Asian women and that acculturation does play a role in influencing both state and trait variables within the model. Overall, our findings showed that the Caucasian and the high-acculturated Asian sample presented with more significant pathways within our revised model than the low-acculturated Asian group. Our findings might therefore indicate that the low-acculturated Asian women might have protective factors, which might prevent them from the negative psychological consequences of self-objectification. Future research in culturally diverse samples would benefit from conducting more experimental and longitudinal studies to evaluate changes of our revised objectification theory constructs and to clarify the direction of causality in the posited relations in the objectification framework.

CONFLICT OF INTEREST STATEMENT

All authors declare that the research was conducted in the absence of any commercial or financial relationship that could be construed as a potential conflict of interest.

AUTHOR AND CONTRIBUTORS

CT, IK, SL, RU and MT drafted the manuscript and conceptualized the aims and hypotheses. MT conducted the analyses. IK, VY, CT, TP set up data collection. All authors provided feedback on different versions of the manuscripts. All authors read and approved the final manuscript and are accountable for all aspects of the work in ensuring that questions related to the accuracy of any part of the work are appropriately investigated.
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Table 1: Sociodemographic details of study participants

|                                      | Total (n=424) | Caucasian (n=162) | More Acculturated (n=133) | Less Acculturated (n=129) |
|--------------------------------------|---------------|-------------------|--------------------------|---------------------------|
| **N (%)**                            |               |                   |                          |                           |
| University student                   | 418 (98.58)   | 162 (100)         | 132 (99.25)              | 124 (96.12)               |
| Highest completed education:         |               |                   |                          |                           |
| Secondary                            | 290 (68.40)   | 133 (82.10)       | 97 (72.93)               | 60 (46.51)                |
| Tertiary                             | 123 (29.01)   | 26 (16.05)        | 34 (25.56)               | 63 (48.84)                |
| Postgraduate                         | 11 (2.59)     | 3 (1.85)          | 2 (1.50)                 | 6 (4.65)                  |
| **Mean (SD)**                        |               |                   |                          |                           |
| Age (years)                          | 19.71 (3.72)  | 20.06 (4.77)      | 19.16 (3.02)             | 19.87 (2.68)              |
| BMI                                  | 21.15 (3.21)  | 22.06 (3.24)      | 20.40 (3.25)             | 20.77 (2.88)              |
Table 2: Descriptive statistics and group difference tests for trait measures

|                          | Less Acculturated (n=129) | More Acculturated (n=133) | Caucasians (n=162) | $F$ (2, 421) | $p$     | eta$^2$ |
|--------------------------|--------------------------|---------------------------|---------------------|--------------|---------|---------|
| Trait self-objectification | -4.12 (12.05)$^c$        | -1.26 (14.34)             | 1.10 (12.42)$^a$    | 5.83         | .003    | .027    |
| Body surveillance        | 4.31 (0.84)$^{bc}$       | 4.55 (1.03)$^{ac}$        | 4.87 (0.96)$^{ab}$  | 12.70        | <.001   | .057    |
| Body shame               | 3.62 (0.88)              | 3.38 (1.08)               | 3.58 (1.17)         | 2.29         | .130    | .010    |
| Appearance anxiety       | 29.93 (6.95)             | 29.64 (9.47)              | 31.31 (10.34)       | 1.43         | .241    | .007    |
| Internalization          | 3.01 (0.85)$^c$          | 3.16 (0.94)$^c$           | 3.46 (0.94)$^{ab}$  | 9.15         | .000    | .042    |
| Eating pathology         | 9.03 (7.71)              | 10.95 (9.31)              | 10.78 (10.98)       | 1.65         | .193    | .008    |

Notes:

$^a$Group differed significantly ($p < .05$, two-tailed) from less acculturated group,

$^b$Group differed significantly from more acculturated group,

$^c$Group differed significantly from Caucasian group.
**Figure 1:** A conceptual model of the revised objectification model including thin-ideal internalization

Note: Intern = Internalization; App Anx = Appearance Anxiety; Bod Surv = Body Surveillance; Trait SO = Trait self-objectification; Bod Shame = Body Shame; EAT = Eating pathology
Figure 2: Differences in the revised objectification model across acculturation groups

a.) Significant pathways for the Caucasian group

b.) Significant pathways for the high acculturated Asian group
c.) Significant pathways for the low acculturated Asian group

Note: Covariates (age and BMI) and non-significant pathways are omitted from the figure for clarity of presentation.

Intern = Internalization; App Anx = Appearance Anxiety; Bod Surv = Body Surveillance; Trait SO = Trait self-objectification; Bod Shame = Body Shame; EAT = Eating pathology