INTERNALIZATION OF THE THIN IDEAL AS A CAUSAL RISK FACTOR AND A MEDIATOR OF INTERVENTION EFFECTS ON EATING DISORDER SYMPTOMS IN WOMEN

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Abstract:
The current cultural definition of female beauty is a source of pressure placed on women to attain extremely thin figures. Incorporation of this standard into how a woman thinks she should look, a desire to attain it and engagement in appearance-invested behaviors refer to the construct of thin-ideal internalization. Three prominent socio-cultural theories of the development of eating disorders propose the impact of internalization of the thin ideal on body image. These are: the socio-cultural model of eating disorders, the tripartite influence model and the objectification theory.

Thin-ideal internalization is a widely recognized risk factor in eating disorders in women. Kraemer’s typology of risk factors provides clarification of the terms correlate, fixed marker, variable risk factor, variable marker and causal risk factor for the certain outcome. At the theoretical level and at the level of application to interventions it represents a useful platform for considering possible risk factors for eating disorders.

The aim of the current study is 1. to review and discuss recent research findings including experimental studies, and use them to classify the thin-ideal internalization according to Kraemer’s typology of risk factors; 2. to review the existing models of mediation, where the prevention program influences eating disorder symptoms through its effect on thin-ideal internalization; 3. to analyze the inclusion of the construct of thin-ideal internalization within the objectification theory framework.

According to Kramer´s typology of risk factors in order to recognize internalization of the thin ideal as a causal risk factor, its manipulation must be shown to change the risk of occurrence of eating disorder symptoms. There are two ways to manipulate the thin-ideal internalization: increasing it in an experimental study or decreasing it in a controlled randomized prevention trial. To confirm its classification as a causal risk factor, more experimental studies with assessment of the internalization of the thin ideal as well as behavioral variables associated with disordered eating are needed. However, randomized prevention trials clearly suggest that internalization of the thin ideal can be classified as a causal risk factor for eating disorders in women.

But when the results from prevention trials are taken into account, the question remains as to whether an intervention aimed at targeting thin-ideal internalization does not collaterally manipulate other variables. It can be addressed by studies investigating mediation in a model where the prevention program influences eating disorder symptoms through its effect on the mediator which is thought to be thin-ideal internalization. Reviewed existing models of mediation further support the consideration of the thin-ideal internalization to be a causal risk factor for eating disorders in women.

Internalization of the socio-cultural ideal of a slim body has deeper roots in the objectification of the female body that was proposed in objectification theory. The construct of thin-ideal internalization is not explicitly included in objectification theory, although recent studies point to a close relatedness of thin-ideal internalization and variables from objectification theory; self-objectification and body surveillance. A broader model of eating disorder symptoms describing the pathway from the pressure to be thin through the internalization of the thin ideal which could lead to body dissatisfaction and eating disturbances through body surveillance should be
verified. It is in contrast with a competing model where the causal relationship between thin-ideal internalization and self-objectification is bidirectional. When considering which factors should be influenced in interventions to produce the required outcome, Kraemer’s typology of risk factors is a useful approach. In designing prevention or intervention programs a causal risk factor has to be targeted because influencing a variable marker will have no effect on the outcome variable. It seems that self-objectification is a causal risk factor as well as thin-ideal internalization, and that programs influencing self-objectification or thin-ideal internalization are equally successful in producing required changes. But as for body surveillance, it is not clear if it is a correlate of disordered eating, variable marker or causal risk factor. In future studies temporal relationships between these constructs (thin-ideal internalization, self-objectification, body surveillance, body dissatisfaction and disordered eating) should be further explored. It seems also useful to implement integrated models of disordered eating in relation to effective intervention strategies with the aim to reduce eating disorder symptoms in women. These studies applying the theoretical models on designing interventions may, in reverse, shed more light on the causal relationships between the factors.

Keywords:
Eating disorders. Thin-ideal internalization. Kraemer’s typology. Causal risk factor. Objectification theory. Self-objectification. Body surveillance.

Introduction

The standards for women’s beauty are influenced by society and culture as well as biological preferences for the right combination of neonate and sexual maturity features (Cunningham, 1986). Cultural definitions of feminine beauty have shifted over the decades with increasing pressure placed on women to attain extremely slim figures (Mazur, 1986). Since the spread of television broadcasting, female media characters have grown thinner (Wiseman et al., 1992), while the beauty standard for males became bigger and more muscular (Mishkind et al., 1986). In addition, toys for girls may also reinforce unrealistic expectations of women’s bodies. For example, a Barbie doll’s body shape is so thin that the probability of it occurring is less than 1 in every 100 000 women (Norton et al., 1996). In children’s media, female physical attractiveness including thinness is associated with sociability, kindness, happiness and success while many obese characters are often portrayed as evil, unattractive, unfriendly or cruel (Herbozo et al., 2004). Moreover, it has been shown that beauty ideals in Western societies are linked to sexist attitudes (Swami et al., 2010). Psychological variables linked to the thin ideal are awareness of the thin ideal, internalization of the thin ideal and perceived pressures to be thin. All three constructs have a significant relationship with body image, although internalization and perceived pressures have a stronger relationship to body image than awareness does (Cafri et al., 2005). The awareness of the thin ideal refers to the knowledge that the ideal exists, whereas internalization refers to an incorporation or acceptance of the ideal (Balci, et al., 2013; Thomson & Stice, 2001). Perceived pressures to be thin include the influence of parents, media and peers (Hardit & Hannum, 2012; Keery, van den Berg, & Thomson, 2004; Shroff & Thompson, 2006; van den Berg et al., 2002) as well as the influence of one’s romantic partner (Tylka, 2011; Tylka & Calogero, 2019). A meta-analysis of Cafri et al. (2005) revealed that it is not simply being aware of the thin ideal that is important in body image attitudes, but rather incorporating such a standard into how a person thinks he or she should look, thus thin-ideal internalization. Indeed awareness of the thin ideal may promote behaviors aimed at achieving the ideal, but internalization of the thin ideal may be closely associated with guilt and other psychological distress when not achieving it (Thompson, Schaefers, & Dedrick, 2018). Previously, the concept of thin-ideal internalization was introduced as a causal risk factor for eating disorders (Thomson & Stice, 2001). Since then, several new studies (e. g. Cruwys, Leverington, & Sheldon, 2016; Greif, Becker, & Hildebrandt, 2015; Linville et al., 2015;
McMillan, Stice, & Rohde, 2011; Stice et al., 2006; Stice et al., 2009; Stice et al., 2015; Stice, Maxfield, & Wells, 2003; Stice, Yokum, & Waters, 2015) have emerged including experimental evidence, which have not been reviewed in this context. Neither thin-ideal internalization nor self-objectification variables were included in the comprehensive review of Jacoby et al. (2004), which applied Kraemer’s typology of risk factors to putative risk factors for eating disorders. Therefore, we aim 1. to review and discuss recent research findings including experimental studies and use them to classify the thin-ideal internalization according to Kraemer’s typology of risk factors 2. to review the existing models of mediation between eating disorder prevention programs and their effect on symptom reduction through the thin-ideal internalization 3. to analyze the inclusion of the construct of thin-ideal internalization within the objectification theory framework.

Classification of the thin-ideal internalization based on Kraemer’s typology of risk factors

Internalization of the thin ideal refers to the degree to which an individual conforms to socially prescribed appearance ideals, expresses a desire to attain the appearance ideal, and engages in behaviors to attain it (Thomson & Stice, 2001). At the theoretical level three prominent socio-cultural theories of development of eating disorders are proposed as to the impact of internalization of the thin ideal on body image as mentioned before (Karazsia et al., 2013). They are: the socio-cultural model of eating disorders (the dual-pathway model) (Stice, 2001), the tripartite influence model (Keery, van den Berg & Thomson, 2004) and the objectification theory (Fredrickson & Roberts, 1997; Moradi & Huang, 2008). It seems that models which integrate these theories may be a useful basis for effective interventions aimed at reducing the occurrence of eating disorder symptoms. However to confirm the theoretically suggested causal relationships empirically, several conditions must be met as proposed in Kraemer’s typology of risk factors (1997).

Kraemer et al. (1997) draw attention to the inconsistent use of the term cause and risk factor and provide a clarification of these terms. The application of this theoretical framework to risk factors for eating disorders may have important implications for designing interventions. For example the identification of a variable marker is important for screening and can help generate a theory about the mechanism that is causally related to the outcome variable (Kazdin et al., 1997). However, in constructing a prevention or intervention program one needs to target a causal risk factor because, by definition, influencing a variable marker will have no effect on the outcome variable (Kraemer et al., 1997).

According to Kraemer et al. (1997), a risk factor is a measurable characteristic of each subject in a particular population that precedes the outcome of interest (e.g. the onset of an eating disorder) and divides the population into a high-risk group (where the probability of the outcome is greater) and a low-risk group (where the probability of the outcome is lower). If the factor only fulfills the second condition but not the precedence of the outcome, it is considered to be a correlate. Factors that are labelled as risk factors can be subsequently distinguished to be a fixed marker, variable marker or causal risk factor. A fixed marker is a risk factor that cannot change (e.g. race or sex). If a risk factor can change spontaneously or can be altered by an intervention, it is considered to be a variable risk factor. Variable risk factors can be further recognized as variable markers or causal risk factors. Intentional manipulation of variable markers is either impossible or does not affect the outcome, while manipulation of the causal risk factors leads to alteration of the outcome variable. Therefore
randomized controlled trials are needed to establish the status of a risk factor as a causal risk factor (Kraemer et al., 1997).

Thomson and Stice (2001) applied this typology to the construct of thin-ideal internalization. As they described since a risk factor must be a measurable characteristic, a measuring scale (Sociocultural Attitudes Towards Appearance Questionnaire) was constructed (Heinberg, Thompson, & Stormer, 1995). Afterwards, the correlation with body image and eating disturbances was confirmed. Then they reviewed how the precedence of the thin-ideal internalization related to eating disorder symptoms was established. A prospective study of Stice and Agras (1998) found that thin-ideal internalization predicted the onset of bulimic symptoms among initially asymptomatic adolescent girls. Therefore it was concluded that previous findings established the thin-ideal internalization as a risk factor for eating disturbances (Thomson & Stice, 2001). However, in order to recognize a risk factor as a causal risk factor, its manipulation must be shown to change the risk of the outcome (Kraemer et al., 1997).

Manipulation of the thin-ideal internalization

There are two ways to modulate a putative causal risk factor. The first way is that the thin-ideal internalization may be increased within a randomized control trial with the onset or increase in eating disorder symptoms as outcomes. This type of study was conducted by Stice, Spangler, and Agras (2001) who randomly assigned adolescent girls to a 15-month fashion magazine subscription or condition with no subscription. However, this long term exposure to thin-images had no major effect on thin-ideal internalization, body dissatisfaction or bulimic symptoms. Consequently, the thin-ideal internalization was not manipulated and therefore its causal effect on eating disorder symptoms cannot be concluded.

Another randomized experiment manipulated the pressure to be thin from peers, wherein an ultra-thin confederate complained about how fat she felt and discussed her extreme weight control techniques (Stice, Maxfield, & Wells, 2003). The pressure to be thin resulted in increased body dissatisfaction among the participants although information about its influence on thin-ideal internalization is missing. A more recent study on this phenomena of “fat talk” (Cruwys, Leverington, & Sheldon, 2016) showed higher body dissatisfaction, negative affect as well as the thin-ideal internalization, but no differences in dieting intentions were found in the peer pressure condition compared to the control. Thus, while the authors were able to manipulate thin-ideal internalization through “fat talk”, its manipulation did not increase dieting intentions. There is a need for further studies on these phenomena which would measure more behavioral variables associated with disordered eating as well as the internalization of the thin ideal.

In this context it is important to distinguish between mere exposure to thin-ideal messages and the internalization of these messages. Therefore it is essential to assess the thin-ideal internalization before and after the procedure that was intended to manipulate it, although it may produce other methodological problems. In large samples experimenters can rely on the randomization process by which all the variables before the manipulation including the thin-ideal internalization will be distributed evenly in the experimental groups. However, large samples are not often used in experimental studies.

The second way includes prevention approaches where the reduction in thin-ideal internalization leads to a decrease in eating disorder symptoms in controlled randomized trials. The efficacy and effectiveness of the prevention program called Body Project, which aims to reduce the internalization of the thin ideal, has been well documented (e.g. Greif, Becker, & Hildebrandt, 2015; Linville et al., 2015; McMillan, Stice, & Rohde, 2011; Stice et al., 2006; Stice et al., 2009).
The Body Project is a prevention program of eating disorders grounded in the theory of cognitive dissonance. The participants are persuaded to voluntarily publicly criticize the thin ideal which leads to a cognitive dissonance in those who had originally admired it. This cognitive dissonance leads to a decrease in the subscription to the thin-ideal (Stice et al., 2008). It was shown that the program decreased thin-ideal internalization and eating disorder symptoms compared to the control group over a 3-year follow-up in an effectiveness trial (Stice et al., 2015). The decrease in thin-ideal internalization was objectively verified using fMRI scans by visualizing the responses in brain regions responsible for reward valuation (Stice, Yokum, & Waters, 2015). This confirmed the experimental manipulation of thin-ideal internalization that resulted from participation in the program. In addition, the assessment indicated a decrease in body dissatisfaction, dieting and bulimic symptoms (Stice et al., 2000). The intervention was also effective in a different setting (Linville et al., 2015) and in a different model of implementation (Greif, Becker, & Hildebrandt, 2015). The experimental evidence that a reduction in thin-ideal internalization resulted in a decrease in body dissatisfaction and bulimic symptoms supports the assumption that the thin-ideal internalization is a causal risk factor for eating disturbances (Thomson & Stice, 2001).

While a review by Keel and Forney (2013) classified the internalization of the thin ideal as a variable risk factor, as these authors did not review studies with an experimental design, a review by Stice (2002) labeled thin-ideal internalization as a causal risk factor for eating disorders highlighting the results from its experimental manipulation in prevention controlled trials. Randomized experiments are not only able to establish precedence and direction of influence like longitudinal studies but are able to rule out the influence of a third variable as well (Duckworth, Tsukayama, & May, 2010). Therefore, experimental results should be taken into account. When considering these data, the thin-ideal internalization can be classified as a causal risk factor for eating disturbances that fulfills the criteria set by Kraemer et al. (1997).

**Internalization of the thin ideal as a mediator**

When the results from prevention trials are taken into account, the question remains as to whether an intervention aimed at targeting thin-ideal internalization does not collaterally manipulate other variables such as body dissatisfaction (Thomson & Stice, 2001). This question can be addressed by studies investigating mediation in a model where the prevention program influences eating disorder symptoms through its effect on the mediator, which is thought to be thin-ideal internalization. According to the definition of a causal risk factor by Kraemer et al. (1997), a change in the thin-ideal internalization caused by prevention program represents the manipulation of the putative causal risk factor, and change in eating disorder symptoms represents the alteration of the outcome variable. The study of Stice et al. (2007) has supported the hypothesis that a change in thin-ideal internalization mediates the effect of the dissonance intervention on reductions in body dissatisfaction, dieting, negative affect and bulimic symptoms. The change in thin-ideal internalization correlated with change in most outcomes, and mostly occurred before change in the outcomes. The effect of the intervention was still significant after controlling for change in the mediator. Therefore, the change in thin-ideal internalization only partially mediated the effect of a prevention program on the outcome variables in adolescent females (Figure 1A). Other variables, such as social support from group members, might also have mediated the effect or the intervention might have directly influenced body dissatisfaction (Stice et al., 2007).

Seidel, Pressnel, and Rosenfield (2009) also confirmed thin-ideal internalization to be a mediator of the effect of dissonance-based prevention programs on bulimic symptoms as
well as adding body dissatisfaction as a second mediator in females. Moreover, they controlled for “reverse mediation” and found a significant reciprocal influence of bulimic symptoms on body dissatisfaction but not thin-ideal internalization (Figure 1B).

Similar results were obtained over a one year follow-up period by Stice et al. (2011). According to this study, change in thin-ideal internalization partially mediated the effects on eating disorder symptoms and fully mediated the effects of intervention on change in body dissatisfaction. Moreover, their post-hoc analyses supported the similar reverse mediation model as proposed by Seidel, Presnell, and Rosenfield (2009) in which the reduction in eating disorder symptoms may have led to decreased thin-ideal internalization, suggesting a mutual influence between mediator and outcome. The change in body dissatisfaction fully mediated the effect of intervention on the change in symptoms (Figure 1C) (Stice et al., 2011). These findings further describe the mechanism of how these relationships may operate (Figure 1).

Several studies on mediation have tested the dual-pathway model of bulimic pathology (Stice & Agras, 1998). According to this model, thin-ideal internalization is one variable leading to bulimic symptoms through a dual pathway (Figure 2). This model posits that individuals may engage in bulimic behavior because of strict dieting or chronic negative affect or a combination of these two conditions (Stice, 2001). In this model, thin-ideal internalization is the central variable that is at the beginning of this pathway. Studies on mediation (Stice, 2001; Stice et al., 2007; Stice et al., 2011; Vander Wal, Gibbons, & Grazioso, 2008) are congruent with this model. Mediation models tested in them are the parts of the theoretical model proposed by Stice and Agras (1998), the dual-pathway model. Models of Seidel, Presnell and Rosenfield (2009) and Stice et al. (2011) (Figure 1) are closer to the proposed theoretical model with body dissatisfaction as a mediator not an outcome variable. On the other hand, Seidel, Presnell and Rosenfield (2009) and Stice et al. (2011) have questioned the directionality of the relationship among the risk factors and have suggested the possibility of reciprocal effects among the components of this model. The results of Seidel, Presnell and Rosenfield (2009) indicate that women who are more accepting of their bodies may also be better able to critically assess the importance of their pursuit of the thin-ideal. These results point to a possible interconnection of mutual relations, which should be verified in further studies. Nevertheless, the causality pathway described in the model as well as the mediation models outlined above are in line with the consideration of the thin-ideal internalization as a causal risk factor for eating disorders.

**Internalization of the thin ideal in the objectification theory**

The socio-cultural ideal of a slim body and its internalization has deeper roots in the objectification of the female body that is normative in our culture. Objectification theory (Fredrickson & Roberts, 1997) posits that sexual objectification is the shared social experience of most women in our culture of being treated as a body or body parts, valued mainly for their use and pleasure of others. This perspective of the view of one’s body is typically adopted given that women are socialized to perceive their own bodies from an observer's perspective. This self-objectification is manifested as body surveillance which is persistent monitoring of the body's outward appearance. According to objectification theory, it has various psychological consequences such as shame, anxiety, reduced peak motivational states and reduced awareness of internal bodily states. These in turn may contribute to women’s increased risk for depression, sexual dysfunction as well as eating disorders (Fredrickson & Roberts, 1997).

Thin-ideal internalization is not explicitly included in objectification theory. However, these concepts are mutually congruent (Moradi & Huang, 2008) since the objectifying culture pressures women to adopt standards of beauty as their own standards, and perceive their own
bodies through the lenses of this cultural ideal. Therefore, it is important to include thin-ideal internalization in the models testing objectification theory as previously suggested (Moradi & Huang, 2008).

Thin-ideal internalization has been suggested to mediate the relationship between socio-cultural pressure to be thin and eating pathology (Stice, 1994; Stice, Nemeroff, & Shaw, 1996). However, an interesting question arises as to how the internalization of the thin ideal leads to body dissatisfaction and eating disturbances. In other words, it is interesting to know the way women with an internalized thin body ideal come to know that they have not achieved such an ideal. Fitzsimmons-Craft et al. (2012) has identified this psychological process as body surveillance which is the indicator of self-objectification. Body surveillance is a habitual monitoring of a body’s outward appearance, which absorbs the considerable part of women’s attention that could have been invested in other activities (Fredrickson & Roberts, 1997).

Therefore, it seems that there is the need for studies verifying the broader model (Figure 3A) describing the pathway from the pressure to be thin through the internalization of the thin body ideal which could lead to body dissatisfaction and eating disturbances through body surveillance. Such a model would integrate these two perspectives on the development of eating disorders, the role of socio-cultural standards of beauty as well as the objectification theory. An integrated model has already had some support from a few studies (e. g. Calogero, Davis, & Thomson, 2005; Dakanalis et al., 2014; Moradi, Dirks, & Matteson, 2005). According to tripartite (Keery, van den Berg, & Thomson, 2004) and quadripartite (Tylka, 2011) influence models, pressure to be thin may be further distinguished as pressure from parents, media, peers and romantic partners (Figure 3B).

**Discussion**

It remains an open question as to why there is a proportion of women that are exposed to the socio-cultural ideal of beauty but yet do not develop body dissatisfaction. Firstly, it could be related to the impact of protective factors such as self-determination (e. g. Matusitz & Martin, 2013; Pelletier, Dion, & Lévesque, 2004), spirituality (e. g. Homan & Boyatzis, 2010; Kim, 2006; Tiggemann & Hage, 2019), feminist views (e. g. Borowsky et al., 2015; Myers & Crowther, 2007) or low social sensitivity (Vander Wal, Gibbons, & Grazioso, 2008).

Secondly, women satisfied with their bodies may pay more attention to those aspects of cultural ideal which they think they have actually fulfilled and ignore others. By this, a woman with a fuller figure may be proud of her long legs and signs of youth as aspects of the cultural beauty ideal. Therefore, she may be satisfied with her body and outward appearance, which could protect her from unhealthy weight control strategies or plastic surgery. This positive way of perceiving one’s body as a protective factor and its possible association with other protective factors needs to be investigated in future studies.

Thirdly, actual weight and body mass index of women must be taken into account even though an ideal woman body is an unrealistic myth and is unattainable for most women (Wolf, 1991). Although only some women are actually overweight in our society, most women feel fat and are ashamed of this "failure" (Fredrickson & Roberts, 1997). However, body mass index of women may modulate the way in which thin-ideal internalization affects body dissatisfaction and subsequently the development of eating disorders.

Women may be exposed to thin-ideal messages, but do not perceive themselves as an object to be looked at and evaluated by others. Therefore, they may place attention on aspects of their being other than appearance and value themselves for other attributes. As a consequence
they may not develop body dissatisfaction and eating disorders. This last option refers to low self-objectification of these women.

There is already some empirical evidence that the constructs of thin-ideal internalization and self-objectification are closely related. First Becker et al. (2013) conducted a study, where they used traditional dissonance-based intervention and also assessed body surveillance. The results showed that the intervention originally designed to target thin-ideal internalization collaterally influenced body surveillance, which was decreased. It is consistent with the above mentioned model (Figure 3A) where the internalization of the thin body ideal leads to body dissatisfaction and eating disturbances through body surveillance.

Another study (Menzel, 2013) adapted a dissonance-based intervention program to target self-objectification. There was no significant difference between their intervention and intervention targeting thin-ideal internalization in the variables of self-objectification and body surveillance. There was also no difference in disordered eating or body dissatisfaction; the programs were equally successful in producing required changes. The authors discussed that the lack of difference between the two groups was likely to speak to the relatedness of the self-objectification variables and internalization of the thin-ideal. The results in this study seem to suggest that the causal relationship between the two variables could be bidirectional (Figure 3C), which was also confirmed in the study by van Dienst and Perez (2013). It is in contrast with the initial model (Figure 3A) suggested by Moradi and Huang (2008) where thin-ideal internalization is an antecedent of body surveillance resulting from self-objectification. This initial model could be tested within an experimental design where peer pressure is manipulated through “fat talk” as has been done previously (Cruwys, Leverington, & Sheldon, 2016; Stice, Maxfield, & Wells, 2003). So far, the experimental foundation for the objectification theory has been limited (e.g. Domoff, 2013; Fredrickson et al., 1998; Harper & Tiggemann, 2008) and therefore the experimental studies are warranted.

Kraemer’s typology of risk factors is a useful approach when considering which factors should be influenced in interventions to produce the required outcome. Since self-objectification and body surveillance are both measurable characteristics, Kraemer’s typology can be applied. As the self-objectification was manipulated in the study of Menzel (2013) and it resulted in the change in disordered eating and body dissatisfaction compared to the control group, it seems that self-objectification is a causal risk factor for eating disorders in accordance with the objectification theory. However, it is not clear if body surveillance is a correlate of disordered eating, a variable marker or a causal risk factor. It is possible that it is only a variable marker, which points to self-objectification standing behind it. Self-objectification could possibly be a causal risk factor, which is useful to influence in interventions. Since only a few studies (e.g. Menzel, 2013; van Dienst & Perez, 2013) examined programs targeting self-objectification, more studies investigating it are warranted.

In the field of application to interventions, body surveillance is not a harmless habit. According to Fredricson and Roberts (1997), this habitual monitoring of a body’s outward appearance absorbs a considerable part of the attention that could have been invested into other activities. Previously it was reported in the cross-sectional study (Tylka & Sabik, 2010) that women who frequently monitored their body and compared it to others’ bodies reported the highest disordered eating. We suggest that it would be useful to influence this factor in interventions. Also intervention strategies that target societal objectification practices themselves can bring benefits. However, only controlled randomized trials could adequately address the question if body surveillance is a correlate of disordered eating, a variable marker or a causal risk factor.

When analysing the relationships between these constructs, knowledge of temporal relationships between them would be useful, but only a few studies (e.g. Dakanalis et al., 2015; Fitzsimmons-Craft et al., 2015; Fitzsimmons-Craft & Bardone-Cone, 2012;
Vandenbosch & Eggermont, 2014; van Dienst & Perez, 2013) have used longitudinal design. In a 3-year longitudinal study Dakanalis et al. (2015) find out that internalization predicted self-objectification, which later predicted dietary restraint and binge eating in adolescents. Body surveillance predicted body dissatisfaction in a two-week longitudinal study (Fitzsimmons-Craft et al., 2015) in college women. Internalization of appearance ideals predicted body surveillance in adolescents in a one-year longitudinal study (Vandenbosch & Eggermont, 2014). All these results are congruent with the broader model described above (Figure 3A), although the evidence is still limited. Studies which use longitudinal design with assessment of these variables (thin-ideal internalization, self-objectification, body surveillance, body dissatisfaction and disordered eating) are warranted when considering the above mentioned competing models.

Conclusion

The correlation of the thin-ideal internalization with eating disturbances, its occurrence before eating disorder symptoms, and findings from randomized controlled trials enable the thin-ideal internalization to be classified as a causal risk factor for eating disorders according to Kraemer’s typology (1997) of risk factors. Based on this assumption on causality, several mediation models were reviewed. In these models thin-ideal internalization either fully or partially mediated the relationship between dissonance-based prevention programs and eating disorder symptoms. Classification of the thin-ideal internalization as a causal risk factor according to Kraemer’s typology supports the focus of prevention and intervention programs to influence this variable, and thereby to affect the occurrence of eating disorders. Further research should concentrate on the exploration of effectiveness of the intervention strategies integrating the socio-cultural theory and the objectification theory. Randomized prevention trials aimed at targeting both self-objectification variables and thin-ideal internalization, and studies exploring temporal relationships between the factors are warranted. Future studies applying these theoretical models within the prevention and intervention field may bring valuable insights, particularly with respect to the causality in the relationships between the explored variables.

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Figure 1: Mediation models through thin-ideal internalization on intervention effects

A

D-B Intervention – T-I Internalization – Body Dissatisfaction

B

D-B Intervention – T-I Internalization – Body Dissatisfaction – Bulimic Symptoms

C

D-B Intervention – T-I Internalization – Body Dissatisfaction – ED Symptoms

Figure 1. Mediation models through thin-ideal internalization on intervention effects

The effect of the dissonance-based intervention on reductions in body dissatisfaction and bulimic symptoms was partially mediated by the thin-ideal internalization in adolescent females (adapted from Stice et al., 2007, 17) (Panel 1A).

The reduction in bulimic symptoms by the dissonance-based intervention was partially mediated by thin-ideal internalization and partially by body dissatisfaction change in female subjects. Thin-ideal internalization partially mediated the relationship between intervention and body dissatisfaction. In addition, change in body dissatisfaction reversely mediated change in thin-ideal internalization and the change in bulimic symptoms reversely mediated change in body dissatisfaction but not the thin-ideal internalization (adapted from Seidel, Presnell, & Rosenfield, 2009, 647) (Panel 1B).

The effects of intervention on eating disorder symptoms were partially mediated by change in thin-ideal internalization and fully mediated by change in body dissatisfaction in female high school students. The effects of intervention on the change in body dissatisfaction were fully mediated by the thin-ideal internalization. In addition, reduction in eating disorder symptoms may have reversely decreased thin-ideal internalization (Stice et al., 2011) (Panel 1C).

D-B Intervention, dissonance-based intervention; T-I Internalization, thin-ideal internalization; ED Symptoms, eating disorder symptoms.
Figure 2: The dual-pathway model of bulimic pathology

Figure 2. The dual-pathway model of bulimic pathology (cited from Stice, 2001, 125)
Thin-ideal (T-I) internalization and pressure to be thin from media, peers and family lead to body dissatisfaction, which in turn fosters dieting and negative effects. In addition, a negative affect is promoted by dieting. Dieting is associated with greater risk for bulimic symptoms and negative affect augments bulimic symptoms. This model posits that individuals may engage in bulimic behavior because of strict dieting or chronic negative affect or combination of these two conditions (Stice, 2001).
**Figure 3:** Models of disordered eating integrating the socio-cultural theory, tripartite influence model and the objectification theory

A

Pressure to be thin → T-I Internalization → Body Surveillance → Body Dissatisfaction / Disordered Eating

B

Pressure to be thin from Parents, Media, Peers, Romantic Partner → T-I Internalization → Body Surveillance → Body Dissatisfaction / Disordered Eating

C

T-I Internalization → Self-objectification → Body Dissatisfaction → Disordered Eating

**Figure 3.** Models of disordered eating integrating the socio-cultural theory, tripartite influence model and the objectification theory

The pressure to be thin leads to body surveillance through the internalization of the thin ideal and consequently leads to body dissatisfaction and eating disturbances (Moradi & Huang, 2008; Fitzsimmons-Craft et al., 2012) (Panel 3A).

Pressure to be thin may result from various sources; from parents, media, peers and romantic partner (Keery, van den Berg, & Thomson, 2004; Tylka, 2011) (Panel 3B).

Thin-ideal internalization and self-objectification simultaneously predict each other and both predict body dissatisfaction, which predict disordered eating (adapted from van Dienst, & Perez, 2013, 20; Menzel, 2013) (Panel 3C).

T-I Internalization, thin-ideal internalization.