



Cross-Cultural Testing of Dietary Restraint

Adrian Meule

Contents

Introduction	2
Measures of Restrained Eating	3
Restraint Scale	3
Three-Factor Eating Questionnaire (TFEQ)	3
Dutch Eating Behavior Questionnaire (DEBQ)	5
Eating Disorder Examination—Questionnaire (EDE—Q)	5
Cross-Cultural Differences in Restrained Eating	5
Challenges in Cross-Cultural Testing of Dietary Restraint	7
Conclusion	8
References	9

Abstract

Restrained eating refers to the intention to restrict food intake deliberately in order to prevent weight gain or to promote weight loss. Research on restrained eating started in the 1970s and, thus, it now encompasses more than 40 years of investigation. This chapter provides a brief overview of the historical development of the concept, describes the most commonly used measures for the assessment of restrained eating, and reviews cross-cultural differences in dietary restraint.

Keywords

Restrained eating · Dietary restraint · Dieting · Weight concern · Cross-cultural

A. Meule (✉)

Department of Psychology, University of Salzburg, Salzburg, Austria

e-mail: adrian.meule@sbg.ac.at

© Springer Nature Switzerland AG 2019

H. L. Meiselman (ed.), *Handbook of Eating and Drinking*,

https://doi.org/10.1007/978-3-319-75388-1_134-1

The hypothesis that differences in the pattern of eating behavior correspond to two theoretically distinct classes of individuals, obese and normal (as measured by degree of overweight), no longer seems tenable, at least in its most elementary form. Within the population of normal weight individuals, fairly sizable differences exist with respect to concern with weight and eating behavior—in our terminology, restraint [. . .]. Herman and Mack (1975, p. 657)

Introduction

In environments in which highly caloric and palatable food is cheap, constantly available, and easily accessible, eating more calories than the body can expend is easy. Thus, it seems that most people (except maybe endurance athletes) need to be conscious about their food decisions and the amount they eat instead of mindlessly indulging in eating. Yet, while it seems necessary to regulate one's eating to prevent becoming overweight, such intentional restriction is also notorious for causing further weight gain or increasing the risk for eating disorders (Schaumberg et al. 2016).

Research on this topic was heavily influenced — or in fact started off — by the works of C. Peter Herman and Janet Polivy (1975, 1983; Herman et al. 1978). In a seminal study (Herman and Mack 1975), participants were instructed to drink either none, one, or two milkshakes followed by a bogus ice cream taste test. It was found that participants scoring low on a measure of dietary restraint ate less ice cream when they before had to drink the milkshakes than in the no milkshake condition. Strikingly, participants scoring high on a measure of dietary restraint — so-called restrained eaters — showed the opposite pattern: they even ate more ice cream in the milkshake conditions than in the no milkshake condition (in which they actually ate less than the unrestrained eaters). Thus, this study indicated that when people restrain their eating behavior, this restriction can easily be disinhibited under certain circumstances (e.g., by consumption of a high-calorie preload).

In the decades that followed, several other manipulations were identified that similarly induce disinhibited eating in restrained eaters, for example, negative mood inductions (Evers et al. 2018). Yet, several limitations of the original conception of restrained eating have been noted in the past decades as well. For example, the Restraint Scale as employed by Herman and Polivy includes questions on weight fluctuations. While it was noted that participants (particularly unrestrained eaters) find these questions hard to answer (Wardle 1986), the items also confound a higher body weight as well as past dieting failures and restraint. As a consequence, Stunkard and Messick (1985) and van Strien et al. (1986) developed alternative measures in order to capture more “pure” cognitive control of eating behavior.

Regardless of which questionnaire is used, however, it seems that scores of dietary restraint scales do not relate to actual reduced food consumption (Stice et al. 2004, 2007, 2010). Thus, restrained eating cannot be equated with dieting, that is, actual caloric restriction. As most restrained eaters are not currently on a diet but are concerned about their weight and try to limit their food intake, restrained eating can

rather be defined as the *intention* to restrict food intake deliberately in order to prevent weight gain or to promote weight loss.

Dietary restraint has been implicated as a risk factor for the development of eating disorders. Furthermore, because of the finding that restrained eating behavior can easily be disinhibited under certain circumstances and because higher restraint scores typically relate to higher body mass index, dietary restraint has a bad reputation for being a rather dysfunctional, unsuccessful strategy to control food intake. Yet, it seems that this deserves a more nuanced view as dietary restraint has also been linked to positive outcomes, particularly in conjunction with weight management programs (Schaumberg et al. 2016).

Measures of Restrained Eating

Several questionnaires have been developed for the assessment of restrained eating. In the following, the four most commonly used scales will be briefly described, each of which has been translated into at least 10 other languages (Table 1).

Restraint Scale

In the early studies by Herman and Polivy, different versions of the Restraint Scale were used (Herman and Mack 1975; Herman and Polivy 1975). The final version of the Revised Restraint Scale has 10 items (Herman et al. 1978; Polivy et al. 1978). The scale includes different response options. For example, some items are scored from 0 = *never* to 3 = *always* but other response categories include different ranges of pounds (e.g., for the question “What is the maximum amount of weight you have ever lost within 1 month?”). The scale can be further separated into two subscales: concern for dieting and weight fluctuations (Blanchard and Frost 1983).

Three-Factor Eating Questionnaire (TFEQ)

The TFEQ (sometimes also referred to as Eating Inventory) was developed by Stunkard and Messick (1985). It has 51 items with different response formats. The scale can be separated into three subscales: cognitive restraint of eating, disinhibition, and hunger. The restraint subscale consists of 21 items. Yet, it has been suggested that the restraint subscale is also not uniform but can be further divided with some items assessing a more rigid control of eating and some items assessing a more flexible control of eating (Westenhoefer 1991). A short version of the TFEQ with 18 items has also been developed (Karlsson et al. 2000). Yet, the three-factor structures of both the original and the short version have received mixed support in subsequent studies (Cappelleri et al. 2009; Mazzeo et al. 2003).

Table 1 Psychometric instruments for the assessment of restrained eating

Measure	Translations
Restraint Scale (Herman et al. 1978; Polivy et al. 1978)	Arabic (Madanat et al. 2007) Chinese (Kong et al. 2013; Mak and Lai 2012) Czech (Bernatova and Svetlak 2017) Dutch (Jansen et al. 1988) Estonian (Tiggemann and Rüütel 2001) French (Mobbs et al. 2008) German (Dinkel et al. 2005) Greek (Kkeli et al. 2018) Japanese (Madanat et al. 2011) Portuguese (Carvalho et al. 2016; Scagliusi et al. 2005) Spanish (Silva and Urzúa-Morales 2010)
Three-Factor Eating Questionnaire (Stunkard and Messick 1985)	Chinese (Chong et al. 2016) Dutch (Ouwens et al. 2003) Finnish (Anglé et al. 2009) French (Lesdéma et al. 2012) German (Pudel and Westenhöfer 1989) Greek (Kavazidou et al. 2012) Italian (Boschi et al. 2001) Japanese (Adachi et al. 1992) Malay (Ismail et al. 2015) Persian (Mostafavi et al. 2017) Portuguese (Moreira et al. 1998) Spanish (Jáuregui-Lobera et al. 2014) Swedish (Karlsson et al. 2000) Thai (Chearskul et al. 2010) Turkish (Bas et al. 2008)
Dutch Eating Behavior Questionnaire (van Strien et al. 1986)	Chinese (Wang et al. 2018; Wu et al. 2017) ^a Dutch (van Strien et al. 1986) French (Lluch et al. 1996) German (Grunert 1989) Greek (Zeeni et al. 2013) Italian (Dakanalis et al. 2013) Korean (Kim et al. 1996) Malay (Subramaniam et al. 2017) Maltese (Dutton and Dovey 2016) Persian (Nejati et al. 2018) Portuguese (Viana and Lourenço 2003) Spanish (Cebolla et al. 2014) Turkish (Bozan et al. 2011)
Eating Disorder Examination—Questionnaire (Fairburn and Beglin 1994)	Chinese (Leung et al. 2009) Dutch (Aardoom et al. 2012) Fijian (Becker et al. 2010) French (Carrard et al. 2015) German (Hilbert and Tuschen-Caffier 2016) Greek (Giovazolias et al. 2013) Italian (Calugi et al. 2017) Japanese (Nakai et al. 2014) Norwegian (Rø et al. 2010) Persian (Mahmoodi et al. 2016)

(continued)

Table 1 (continued)

Measure	Translations
	Portuguese (Machado et al. 2014) Spanish (Elder and Grilo 2007) Swedish (Welch et al. 2011) Turkish (Yucel et al. 2011)

^aNote that the Dutch Eating Behavior Questionnaire — as it names says — was first conceived in Dutch, of course. However, as the English version (items of which are displayed in the original article by van Strien and colleagues) is usually used as the basis for translation in other languages; the list of translations is displayed like this here to be consistent across the different instruments

Dutch Eating Behavior Questionnaire (DEBQ)

The DEBQ was developed by van Strien et al. (1986). It has 33 items that are scored from 1 = *never* to 5 = *very often*. The scale can be separated into three subscales: restrained eating, emotional eating, and external eating. The restraint subscale consists of 10 items. The three-factor structure has generally received good support in other studies (Barrada et al. 2016).

Eating Disorder Examination—Questionnaire (EDE—Q)

The EDE—Q was developed by Fairburn and Beglin (1994). It has 28 items of which 6 items assess the frequency of key behaviors such as binge eating and self-induced vomiting in the past 28 days. The remaining 22 items have different response options (e.g., 0 = *no days* to 6 = *every day*) and can be separated into four subscales: restraint, eating concern, weight concern, and shape concern. Yet, this four-factor structure has received limited support in the literature (Rand-Giovannetti et al. [in press](#)).

Cross-Cultural Differences in Restrained Eating

Several studies have examined whether participants in different countries differ in their scores on restrained eating questionnaires. It has generally been observed that participants in Europe (e.g., in Germany, the UK, and the Netherlands) have lower scores on the Restraint Scale than participants in North America (Dinkel et al. 2005; Jansen et al. 1998; Wardle 1986; Fig. 1). Other studies (using either the Restraint Scale or the restraint subscale of the TFEQ, DEBQ, or EDE—Q) point towards lower restraint scores in African, Arabian, and Asian countries than in North American and European countries. For example, lower restraint scores have been found in Ghana versus USA students (Cogan et al. 1996; Fig. 1), Egypt versus UK women (Dolan and Ford 1991; Fig. 1), Iran versus UK/Greece students (Tapper et al. 2008), and China versus USA female students (Madanat et al. 2011). In Australia, lower

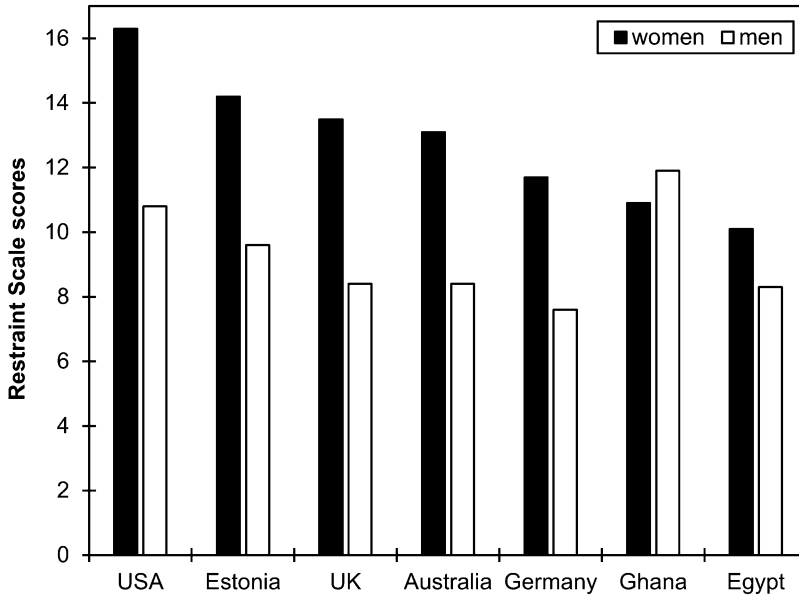


Fig. 1 Mean scores on the Restraint Scale in different countries as a function of sex. The data are taken from Cogan et al. (1996), Dinkel et al. (2005), Dolan and Ford (1991), Tiggemann and Rüütel (2001), and Wardle (1986)

restraint scores have been reported as compared to students in Estonia (Tiggemann and Rüütel 2001; Fig. 1) and Singapore Chinese women (Soh et al. 2007).

Although some of these studies only investigated women, studies that included participants of both sexes suggest that differences in restrained eating between countries seem to be primarily driven by restraint scores of women. Specifically, women usually display higher restrained eating than men do in North American, Australian, and European samples. This sex difference resonates with a large body of research showing that women are more concerned about their weight and shape and have a higher prevalence of disordered eating behaviors than men have. In countries with lower restrained eating scores, however, there seems to be no such difference between sexes (Cogan et al. 1996; Dolan and Ford 1991; Fig. 1).

Besides these cross-cultural differences, however, several studies found similar levels of restrained eating between different countries. For example, no differences in dietary restraint were found between UK versus Israel women during or after pregnancy (Shloim et al. 2015, *in press*), Lebanon versus Cyprus female students (Zeeni et al. 2013), Japan versus Jordan versus USA female students (Madanat et al. 2011), and Greece versus UK students (Tapper et al. 2008).

Thus, it seems that no broad conclusions regarding different world regions can be drawn as differences in restrained eating can be observed within the same continent (e.g., China vs. Japan; Madanat et al. 2011) or scores are sometimes similar across countries in different continents (e.g., Jordan vs. USA; Madanat et al. 2011).

Furthermore, differences in dietary restraint can also be observed between different ethnic groups within one country. For example, lower restrained eating has been reported in Afro-American versus Caucasian female students in the USA (Abrams et al. 1993; Rucker III and Cash 1992). Thus, it seems necessary for future research to not only compare scores of participants in different countries but also to consider other factors (e.g., ethnicity, migration background) within each country.

Given these cross-cultural differences — although inconsistent — an interesting line of research pertains to the question of acculturation. Does moving to another country lead to increases or decreases in restraint scores because the new environment changes one's attitudes towards eating and body weight? Although there are not many studies on this, it seems that levels of restrained eating can be quite stable. For example, Abdollahi and Mann (2001) tested Iranian women living in Iran and Iranian women living in the USA and found no differences in restrained eating between groups. Furthermore, a recent study by Westenhoefer et al. (2018) found that seafarers from Kiribati had higher TFEQ disinhibition scores (and these were more strongly related to body mass index) than seafarers from Europe. Although disinhibited eating is not equivalent to (but is positively correlated with) restrained eating, this study suggests that cultural background can still account for differences in eating behavior in the same food environment.

Even if two cultures exhibit similar levels of restrained eating, its predictors and consequences might still be culture-specific. In a recent study by Shagar et al. (2019), for example, body dissatisfaction was linked to restrained eating only in Australian but not in Malaysian women. Furthermore, family influence related to internalization of the thin ideal only in Malaysian but not in Australian women. Although these differences were found, however, the authors also highlighted that overall there were more similarities than differences across cultures. For example, higher internalization of the thin ideal was linked to higher restrained eating in both Australian and Malaysian women.

In conclusion, studies that examined cross-cultural differences in restrained eating tend to show highest levels of dietary restraint in the USA, followed by European countries and Australia, and lowest levels in African and Asian countries such as Ghana, Egypt, Iran, and China. However, this conclusion is based only on a handful of studies and, therefore, findings need to be interpreted cautiously. Interestingly, it seems that studies that reported similar levels of restrained eating across different countries are more recent while research that reported differences between certain countries includes studies from the 1980s and 1990s. Thus, it might be speculated that there is an overall trend towards an alignment of restraint scores across countries, which may be due to changes in diet (e.g., Westernization of traditional Eastern diets) and other factors (e.g., media exposure, thin ideal internalization).

Challenges in Cross-Cultural Testing of Dietary Restraint

It is usually assumed that differences in restrained eating between countries or ethnic groups are due to cultural differences such as eating traditions, social interactions, or

media exposure. However, there are also methodological and anthropometrical issues that need to be considered. For example — as discussed below — higher restrained eating scores can result from having a higher body weight. Thus, it may be that cross-cultural differences in restraint may be partially attributable to general differences in mean body mass index between countries. That is, higher restraint scores in a country may simply be the result of people being heavier there instead of reflecting dietary restriction. This may be particularly relevant for the Restraint Scale as answers to the weight fluctuations questions are highly correlated with body mass index.

Furthermore, the response categories of the weight fluctuations questions may not be equally applicable to all ethnic groups because of different body build. Asian populations, for example, have lower body mass index and different associations between body mass index and body fat than non-Asian populations (WHO Expert Consultation 2004). For instance, some Asian groups have higher percent body fat at a low body mass index than Caucasians due to differences in trunk-to-leg length and slenderness (Deurenberg et al. 2002).

Such differences in body build and body composition may also influence the relationship between body mass index and restrained eating. Specifically, higher restrained eating — particularly when assessed with the Restraint Scale — is usually positively correlated with body mass index. That is, most restrained eaters have a higher body weight than unrestrained eaters. This relationship is likely bidirectional: restrained eating may predict weight gain (van Strien et al. 2014), but having a high body weight may also lead to higher restraint scores as the desire for losing weight (and, thus, the intention to restrict food intake) increases with increasing body weight (Snoek et al. 2008). Surprisingly, however, restrained eating scores were unrelated to body mass index in some studies from China, even when participants were explicitly classified as successful and unsuccessful restrained eaters (Meule 2016).

Finally, it may be that differences in nutrition can account for differences in the relationship between body weight and restrained eating. For example, the traditional Chinese diet is healthier (i.e., less energy dense) than the typical North American diet (Lv and Cason 2004). Thus, it might be that rather unsuccessful restrained eaters living in countries with a healthier diet may still have a healthier weight than those living in countries with an unhealthy diet because — although they might consider themselves unsuccessful — they still do not consume large amounts of calories. Yet, as typical diets in many countries are more and more “Westernized,” it may be that this will also lead to a decrease of cross-cultural differences in the relationship between body weight and restrained eating.

Conclusion

Restrained eating or dietary restraint refers to cognitive effort exerted by an individual to eat less than they would like. Higher restrained eating scores have been related to instances of disinhibited eating and higher body weight. However, as

Schaumberg et al. (2016) have noted, “dietary restraint cannot be categorized as entirely healthy or unhealthy, but rather could be health promoting or detrimental depending on the circumstances under which it is employed” (p. 96). Although some studies point towards highest levels of restrained eating in North America followed by European countries and Australia and then African, Arabic, and Asian regions, the extant literature on cross-cultural differences in dietary restraint does not provide a consistent overall picture. This may be partially due to methodological and anthropometric issues that need to be considered in cross-cultural testing of dietary restraint.

References

- Aardoom, J. J., Dingemans, A. E., Slof Op't Landt, M. C. T., & Van Furth, E. F. (2012). Norms and discriminative validity of the Eating Disorder Examination Questionnaire (EDE-Q). *Eating Behaviors, 13*, 305–309. <https://doi.org/10.1016/j.eatbeh.2012.09.002>.
- Abdollahi, P., & Mann, T. (2001). Eating disorder symptoms and body image concerns in Iran: Comparisons between Iranian women in Iran and in America. *International Journal of Eating Disorders, 30*, 259–268. <https://doi.org/10.1002/eat.1083>.
- Abrams, K. K., Allen, L. R., & Gray, J. J. (1993). Disordered eating attitudes and behaviors, psychological adjustment, and ethnic identity: A comparison of black and white female college students. *International Journal of Eating Disorders, 14*, 49–57. [https://doi.org/10.1002/1098-108X\(199307\)14:1<49::AID-EAT2260140107>3.0.CO;2-Z](https://doi.org/10.1002/1098-108X(199307)14:1<49::AID-EAT2260140107>3.0.CO;2-Z).
- Adachi, T., Fujii, K., & Yamagami, T. (1992). Responses regarding restrained eating on the Three-Factor Eating Questionnaire and weight loss. *Japanese Journal of Behavioral Therapy, 18*, 54–66.
- Anglé, S., Engblom, J., Eriksson, T., Kautiainen, S., Saha, M.-T., Lindfors, P., . . . Rimpelä, A. (2009). Three factor eating questionnaire-R18 as a measure of cognitive restraint, uncontrolled eating and emotional eating in a sample of young Finnish females. *International Journal of Behavioral Nutrition and Physical Activity, 6*(41), 1–7. <https://doi.org/10.1186/1479-5868-6-41>.
- Barrada, J. R., van Strien, T., & Cebolla, A. (2016). Internal structure and measurement invariance of the Dutch Eating Behavior Questionnaire (DEBQ) in a (nearly) representative Dutch community sample. *European Eating Disorders Review, 24*, 503–509. <https://doi.org/10.1002/erv.2448>.
- Bas, M., Bozan, N., & Cigerim, N. (2008). Dieting, dietary restraint, and binge eating disorder among overweight adolescents in Turkey. *Adolescence, 43*, 635–648.
- Becker, A. E., Thomas, J. J., Bainivualiku, A., Richards, L., Navara, K., Roberts, A. L., . . . Striegel-Moore, R. H. (2010). Validity and reliability of a Fijian translation and adaptation of the Eating Disorder Examination Questionnaire. *International Journal of Eating Disorders, 43*, 171–178. <https://doi.org/10.1002/eat.20675>.
- Bernatova, T., & Svetlak, M. (2017). Emotional and interoceptive awareness and its relationship to restriction in young women with eating disorders and healthy controls: A cascade from emotional to behavioral dysregulation. *Activitas Nervosa Superior, 59*, 78–86. <https://doi.org/10.1007/s41470-017-0006-z>.
- Blanchard, F. A., & Frost, R. O. (1983). Two factors of restraint: Concern for dieting and weight fluctuation. *Behaviour Research and Therapy, 21*, 259–267. [https://doi.org/10.1016/0005-7967\(83\)90208-5](https://doi.org/10.1016/0005-7967(83)90208-5).
- Boschi, V., Iorio, D., Margiotta, N., D'Orsi, P., & Falconi, C. (2001). The Three-Factor Eating Questionnaire in the evaluation of eating behaviour in subjects seeking participation in a dietotherapy programme. *Annals of Nutrition and Metabolism, 45*, 72–77. <https://doi.org/10.1159/000046709>.

- Bozan, N., Bas, M., & Asci, F. H. (2011). Psychometric properties of Turkish version of Dutch Eating Behaviour Questionnaire (DEBQ). A preliminary results. *Appetite*, *56*, 564–566. <https://doi.org/10.1016/j.appet.2011.01.025>.
- Calugi, S., Milanese, C., Sartirana, M., El Ghoch, M., Sartori, F., Geccherle, E., . . . Dalle Grave, R. (2017). The Eating Disorder Examination Questionnaire: Reliability and validity of the Italian version. *Eating and Weight Disorders*, *22*, 509–514. <https://doi.org/10.1007/s40519-016-0276-6>.
- Cappelleri, J. C., Bushmakin, A. G., Gerber, R. A., Leidy, N. K., Sexton, C. C., Lowe, M. R., & Karlsson, J. (2009). Psychometric analysis of the Three-Factor Eating Questionnaire-R21: Results from a large diverse sample of obese and non-obese participants. *International Journal of Obesity*, *33*, 611–620. <https://doi.org/10.1038/ijo.2009.74>.
- Carrard, I., Lien Rebetz, M. M., Mobbs, O., & Van der Linden, M. (2015). Factor structure of a French version of the eating disorder examination-questionnaire among women with and without binge eating disorder symptoms. *Eating and Weight Disorders*, *20*, 137–144. <https://doi.org/10.1007/s40519-014-0148-x>.
- Carvalho, J., Marques, M. M., Ferreira, M. B., & Lima, M. L. (2016). Construct validation of the Portuguese version of the Restraint Scale. *Psychology, Community & Health*, *5*, 134–151. <https://doi.org/10.5964/pch.v5i2.170>.
- Cebolla, A., Barrada, J. R., van Strien, T., Oliver, E., & Baños, R. (2014). Validation of the Dutch Eating Behavior Questionnaire (DEBQ) in a sample of Spanish women. *Appetite*, *73*, 58–64. <https://doi.org/10.1016/j.appet.2013.10.014>.
- Chearskul, S., Pummoung, S., Vongsaiyat, S., Janyachailert, P., & Phattharayuttawat, S. (2010). Thai version of Three-Factor Eating Questionnaire. *Appetite*, *54*, 410–413. <https://doi.org/10.1016/j.appet.2010.01.005>.
- Chong, M. F.-F., Ayob, M. N., Chong, K. J., Tai, E. S., Khoo, C. M., Leow, M. K.-S., . . . Khoo, E. Y.-H. (2016). Psychometric analysis of an eating behaviour questionnaire for an overweight and obese Chinese population in Singapore. *Appetite*, *101*, 119–124. <https://doi.org/10.1016/j.appet.2016.03.005>.
- Cogan, J. C., Bhalla, S. K., Sefa-Dedeh, A., & Rothblum, E. D. (1996). A comparison study of United States and African students on perceptions of obesity and thinness. *Journal of Cross-Cultural Psychology*, *27*, 98–113. <https://doi.org/10.1177/0022022196271007>.
- Dakanalis, A., Zanetti, M. A., Clerici, M., Madeddu, F., Riva, G., & Caccialanza, R. (2013). Italian version of the Dutch Eating Behavior Questionnaire. Psychometric properties and measurement invariance across sex, BMI-status and age. *Appetite*, *71*, 187–195. <https://doi.org/10.1016/j.appet.2013.08.010>.
- Deurenberg, P., Deurenberg-Yap, M., & Guricci, S. (2002). Asians are different from Caucasians and from each other in their body mass index/body fat per cent relationship. *Obesity Reviews*, *3*, 141–146. <https://doi.org/10.1046/j.1467-789X.2002.00065.x>.
- Dinkel, A., Berth, H., Exner, C., Rief, W., & Balck, F. (2005). German version of the Restraint Scale for the assessment of restrained eating. *Diagnostica*, *51*, 67–74. <https://doi.org/10.1026/0012-1924.51.2.67>.
- Dolan, B., & Ford, K. (1991). Binge eating and dietary restraint: A cross-cultural analysis. *International Journal of Eating Disorders*, *10*, 345–353. [https://doi.org/10.1002/1098-108X\(199105\)10:3<345::AID-EAT2260100310>3.0.CO;2-9](https://doi.org/10.1002/1098-108X(199105)10:3<345::AID-EAT2260100310>3.0.CO;2-9).
- Dutton, E., & Dovey, T. M. (2016). Validation of the Dutch Eating Behaviour Questionnaire (DEBQ) among Maltese women. *Appetite*, *107*, 9–14. <https://doi.org/10.1016/j.appet.2016.07.017>.
- Elder, K. A., & Grilo, C. M. (2007). The Spanish language version of the Eating Disorder Examination Questionnaire: Comparison with the Spanish language version of the eating disorder examination and test–retest reliability. *Behaviour Research and Therapy*, *45*, 1369–1377. <https://doi.org/10.1016/j.brat.2006.08.012>.
- Evers, C., Dingemans, A., Junghans, A. F., & Boevé, A. (2018). Feeling bad or feeling good, does emotion affect your consumption of food? A meta-analysis of the experimental evidence.

- Neuroscience & Biobehavioral Reviews*, 92, 195–208. <https://doi.org/10.1016/j.neubiorev.2018.05.028>.
- Fairburn, C. G., & Beglin, S. J. (1994). Assessment of eating disorders: Interview or self-report questionnaire? *International Journal of Eating Disorders*, 16, 363–370. [https://doi.org/10.1002/1098-108X\(199412\)16:4<363::AID-EAT2260160405>3.0.CO;2-#](https://doi.org/10.1002/1098-108X(199412)16:4<363::AID-EAT2260160405>3.0.CO;2-#).
- Giovazolias, T., Tsaousis, I., & Vallianatou, C. (2013). The factor structure and psychometric properties of the Greek version of the Eating Disorders Examination Questionnaire (EDE-Q). *European Journal of Psychological Assessment*, 29, 189–196. <https://doi.org/10.1027/1015-5759/a000138>.
- Grunert, S. C. (1989). Ein Inventar zur Erfassung von Selbstaussagen zum Ernährungsverhalten. *Diagnostica*, 35, 167–179.
- Herman, C. P., & Mack, D. (1975). Restrained and unrestrained eating. *Journal of Personality*, 43, 647–660. <https://doi.org/10.1111/j.1467-6494.1975.tb00727.x>.
- Herman, C. P., & Polivy, J. (1975). Anxiety, restraint, and eating behavior. *Journal of Abnormal Psychology*, 84, 666–672. <https://doi.org/10.1037/0021-843X.84.6.666>.
- Herman, C. P., & Polivy, J. (1983). A boundary model for the regulation of eating. *Psychiatric Annals*, 13, 918–927. <https://doi.org/10.3928/0048-5713-19831201-03>.
- Herman, C. P., Polivy, J., Pliner, P., Threlkeld, J., & Munic, D. (1978). Distractibility in dieters and nondieters: An alternative view of “externality”. *Journal of Personality and Social Psychology*, 36, 536–548. <https://doi.org/10.1037/0022-3514.36.5.536>.
- Hilbert, A., & Tuschen-Caffier, B. (2016). *Eating Disorder Examination–Questionnaire*. Tübingen: dgvt Verlag.
- Ismail, R., Noh, M., Ismail, N. H., & Tamil, A. M. (2015). A tale of two construct validation analysis: Rasch model and exploratory factor analysis approach for Three-Factor Eating Questionnaire (TFEQ-R21) among Malaysian male workers. *Medical Journal of Malaysia*, 70, 169–176.
- Jansen, A., Oosterlaan, J., Merckelbach, H., & van den Hout, M. (1988). Nonregulation of food intake in restrained, emotional, and external eaters. *Journal of Psychopathology and Behavioral Assessment*, 10, 345–354. <https://doi.org/10.1007/bf00960627>.
- Jansen, A., Louwse, E., Leemans, N., & Schouten, E. (1998). Self-esteem as a better predictor of restrained eaters’ food intake than attributional style and disinhibition tendency. *European Journal of Personality*, 12, 43–56. [https://doi.org/10.1002/\(SICI\)1099-0984\(199801/02\)12:1<43::AID-PER294>3.0.CO;2-9](https://doi.org/10.1002/(SICI)1099-0984(199801/02)12:1<43::AID-PER294>3.0.CO;2-9).
- Jáuregui-Lobera, I., García-Cruz, P., Carbonero-Carreño, R., Magallares, A., & Ruiz-Prieto, I. (2014). Psychometric properties of Spanish version of the Three-Factor Eating Questionnaire-R18 (Tfeq-Sp) and its relationship with some eating- and body image-related variables. *Nutrients*, 6, 5619–5635. <https://doi.org/10.3390/nu6125619>.
- Karlsson, J., Persson, L. O., Sjöström, L., & Sullivan, M. (2000). Psychometric properties and factor structure of the Three-Factor Eating Questionnaire (TFEQ) in obese men and women. Results from the Swedish Obese Subjects (SOS) study. *International Journal of Obesity*, 24, 1715–1725. <https://doi.org/10.1038/sj.ijo.0801442>.
- Kavazidou, E., Proios, M., Liolios, I., Doganis, G., Petrou, K., Tsatsoulis, A., & Tsiligioglou-Fachantidou, A. (2012). Structure validity of the Three-Factor Eating Questionnaire-R18 in Greek population. *Journal of Human Sport & Exercise*, 7, 218–226. <https://doi.org/10.4100/jhse.2012.71.01>.
- Kim, H. J., Lee, I. S., & Kim, J. H. (1996). A study of the reliability and validity of the Korean version of the Eating Behavior Questionnaire. *Korean Journal of Clinical Psychology*, 15, 141–150.
- Kkeli, N., Michaelides, M. P., & Karekla, M. (2018). The Greek version of the Restraint Scale: Validation in a student sample in Cyprus. *Hellenic Journal of Psychology*, 15, 1–14.
- Kong, F., Zhang, Y., & Chen, H. (2013). The construct validity of the Restraint Scale among mainland Chinese women. *Eating Behaviors*, 14, 356–360. <https://doi.org/10.1016/j.eatbeh.2013.06.009>.

- Lesdéma, A., Fromentin, G., Daudin, J.-J., Arlotti, A., Vinoy, S., Tome, D., & Marsset-Baglieri, A. (2012). Characterization of the Three-Factor Eating Questionnaire scores of a young French cohort. *Appetite*, *59*, 385–390. <https://doi.org/10.1016/j.appet.2012.05.027>.
- Leung, S. F., Lee, K. L., Lee, S. M., Leung, S. C., Hung, W. S., Lee, W. L., . . . Wong, Y. N. (2009). Psychometric properties of the SCOFF questionnaire (Chinese version) for screening eating disorders in Hong Kong secondary school students: A cross-sectional study. *International Journal of Nursing Studies*, *46*, 239–247. <https://doi.org/10.1016/j.ijnurstu.2008.09.004>.
- Lluch, A., Kahn, J. P., Stricker-Krongrad, A., Ziegler, O., Drouin, P., & Méjean, L. (1996). Internal validation of a French version of the Dutch Eating Behaviour Questionnaire. *European Psychiatry*, *11*, 198–203. [https://doi.org/10.1016/0924-9338\(96\)88391-X](https://doi.org/10.1016/0924-9338(96)88391-X).
- Lv, N., & Cason, K. L. (2004). Dietary pattern change and acculturation of Chinese Americans in Pennsylvania. *Journal of the American Dietetic Association*, *104*, 771–778. <https://doi.org/10.1016/j.jada.2004.02.032>.
- Machado, P. P. P., Martins, C., Vaz, A. R., Conceição, E., Bastos, A. P., & Gonçalves, S. (2014). Eating Disorder Examination Questionnaire: Psychometric properties and norms for the Portuguese population. *European Eating Disorders Review*, *22*, 448–453. <https://doi.org/10.1002/erv.2318>.
- Madanat, H. N., Brown, R. B., & Hawks, S. R. (2007). The impact of body mass index and Western advertising and media on eating style, body image and nutrition transition among Jordanian women. *Public Health Nutrition*, *10*, 1039–1046. <https://doi.org/10.1017/S1368980007666713>.
- Madanat, H. N., Lindsay, R., Hawks, S. R., & Ding, D. (2011). A comparative study of the culture of thinness and nutrition transition in university females in four countries. *Asia Pacific Journal of Clinical Nutrition*, *20*, 102–108. <https://doi.org/10.6133/apjcn.2011.20.1.15>.
- Mahmoodi, M., Moloodi, R., Ghaderi, A., Babai, Z., Saleh, Z., Alasti, H., . . . Mohammadpour, Z. (2016). The Persian version of Eating Disorder Examination Questionnaire and Clinical Impairment Assessment: Norms and psychometric properties for undergraduate women. *Iranian Journal of Psychiatry*, *11*, 67–74.
- Mak, K.-K., & Lai, C.-M. (2012). Assessment of dietary restraint: Psychometric properties of the revised Restraint Scale in Hong Kong adolescents. *International Journal of Behavioral Medicine*, *19*, 199–207. <https://doi.org/10.1007/s12529-011-9161-x>.
- Mazzeo, S. E., Aggen, S. H., Anderson, C., Tozzi, F., & Bulik, C. M. (2003). Investigating the structure of the eating inventory (Three-Factor Eating Questionnaire): A confirmatory approach. *International Journal of Eating Disorders*, *34*, 255–264. <https://doi.org/10.1002/eat.10180>.
- Meule, A. (2016). Cultural reflections on restrained eating. *Frontiers in Psychology*, *7*(205), 1–3. <https://doi.org/10.3389/fpsyg.2016.00205>.
- Mobbs, O., Ghisletta, P., & Van der Linden, M. (2008). Clarifying the role of impulsivity in dietary restraint: A structural equation modeling approach. *Personality and Individual Differences*, *45*, 602–606. <https://doi.org/10.1016/j.paid.2008.06.021>.
- Moreira, P., Almeida, L., Sampaio, D., & Almeida, M. D. V. (1998). Validação de uma escala para avaliação do comportamento alimentar de jovens universitários saudáveis. *Revista Ibero-Americana de Diagnóstico e Avaliação Psicológica*, *6*, 125–136.
- Mostafavi, S.-A., Akhondzadeh, S., Mohammadi, M. R., Eshraghian, M. R., Hosseini, S., Chamari, M., & Keshavarz, S. A. (2017). The reliability and validity of the Persian version of Three-Factor Eating Questionnaire-R18 (TFEQ-R18) in overweight and obese females. *Iranian Journal of Psychiatry*, *12*, 100–108.
- Nakai, Y., Nin, K., Fukushima, M., Nakamura, K., Noma, S., Teramukai, S., . . . Wonderlich, S. (2014). Eating Disorder Examination Questionnaire (EDE-Q): Norms for undergraduate Japanese women. *European Eating Disorders Review*, *22*, 439–442. <https://doi.org/10.1002/erv.2324>.
- Nejati, V., Alipour, F., Saeidpour, S., & Bodaghi, E. (2018). Psychometric properties of Persian version of Dutch Eating Behavior Questionnaire. *Journal of Fundamentals of Mental Health*, *20*, 5–14.

- Ouwens, M. A., van Strien, T., & van der Staak, C. P. F. (2003). Tendency toward overeating and restraint as predictors of food consumption. *Appetite, 40*, 291–298. [https://doi.org/10.1016/S0195-6663\(03\)00006-0](https://doi.org/10.1016/S0195-6663(03)00006-0).
- Polivy, J., Herman, C. P., & Warsh, S. (1978). Internal and external components of emotionality in restrained and unrestrained eaters. *Journal of Abnormal Psychology, 87*, 497–504. <https://doi.org/10.1037/0021-843X.87.5.497>.
- Pudel, V., & Westenhöfer, J. (1989). *Fragebogen zum Eßverhalten (FEV) – Handanweisung*. Göttingen: Hogrefe.
- Rand-Giovannetti, D., Cicero, D. C., Mond, J. M., & Latner, J. D. (in press). Psychometric properties of the Eating Disorder Examination–Questionnaire (EDE-Q): A confirmatory factor analysis and assessment of measurement invariance by sex. *Assessment*. <https://doi.org/10.1177/1073191117738046>.
- Rø, Ø., Reas, D. L., & Lask, B. (2010). Norms for the Eating Disorder Examination Questionnaire among female university students in Norway. *Nordic Journal of Psychiatry, 64*, 428–432. <https://doi.org/10.3109/08039481003797235>.
- Rucker, C. E., III, & Cash, T. F. (1992). Body images, body-size perceptions, and eating behaviors among African-American and white college women. *International Journal of Eating Disorders, 12*, 291–299. [https://doi.org/10.1002/1098-108X\(199211\)12:3<291::AID-EAT2260120309>3.0.CO;2-A](https://doi.org/10.1002/1098-108X(199211)12:3<291::AID-EAT2260120309>3.0.CO;2-A).
- Scagliusi, F. B., Polacow, V. O., Cordás, T. A., Coelho, D., Alvarenga, M., Philippi, S. T., & Lancha, A. H. (2005). Test–retest reliability and discriminant validity of the Restraint Scale translated into Portuguese. *Eating Behaviors, 6*, 85–93. <https://doi.org/10.1016/j.eatbeh.2004.06.001>.
- Schaumberg, K., Anderson, D. A., Anderson, L. M., Reilly, E. E., & Gorrell, S. (2016). Dietary restraint: What’s the harm? A review of the relationship between dietary restraint, weight trajectory and the development of eating pathology. *Clinical Obesity, 6*, 89–100. <https://doi.org/10.1111/cob.12134>.
- Shagar, P. S., Donovan, C. L., Loxton, N., Boddy, J., & Harris, N. (2019). Is thin in everywhere?: A cross-cultural comparison of a subsection of Tripartite Influence Model in Australia and Malaysia. *Appetite, 134*, 59–68. <https://doi.org/10.1016/j.appet.2018.12.025>.
- Shloim, N., Hetherington, M. M., Rudolf, M., & Feltbower, R. G. (2015). Relationship between body mass index and women’s body image, self-esteem and eating behaviours in pregnancy: A cross-cultural study. *Journal of Health Psychology, 20*, 413–426. <https://doi.org/10.1177/1359105313502568>.
- Shloim, N., Rudolf, M. C. J., Feltbower, R. G., Blundell-Birtill, P., & Hetherington, M. M. (in press). Israeli and British women’s wellbeing and eating behaviours in pregnancy and postpartum. *Journal of Reproductive and Infant Psychology*. <https://doi.org/10.1080/02646838.2018.1529408>.
- Silva, J. R., & Urzúa-Morales, A. (2010). Spanish version of the revised Restraint Scale: Psychometric properties in an adolescent sample. *Universitas Psychologica, 9*, 521–530.
- Snoek, H. M., van Strien, T., Janssens, J., & Engels, R. (2008). Restrained eating and BMI: A longitudinal study among adolescents. *Health Psychology, 27*, 753–759. <https://doi.org/10.1037/0278-6133.27.6.753>.
- Soh, N. L.-W., Touyz, S., Dobbins, T. A., Surgenor, L. J., Clarke, S., Kohn, M. R., . . . Walter, G. (2007). Restraint and eating concern in North European and east Asian women with and without eating disorders in Australia and Singapore. *Australian and New Zealand Journal of Psychiatry, 41*, 536–545. <https://doi.org/10.1080/00048670701332318>.
- Stice, E., Fisher, M., & Lowe, M. R. (2004). Are dietary restraint scales valid measures of acute dietary restriction? Unobtrusive observational data suggest not. *Psychological Assessment, 16*, 51–59. <https://doi.org/10.1037/1040-3590.16.1.51>.
- Stice, E., Cooper, J. A., Schoeller, D. A., Tappe, K., & Lowe, M. R. (2007). Are dietary restraint scales valid measures of moderate- to long-term dietary restriction? Objective biological and

- behavioral data suggest not. *Psychological Assessment*, 19, 449–458. <https://doi.org/10.1037/1040-3590.19.4.449>.
- Stice, E., Sysko, R., Roberto, C. A., & Allison, S. (2010). Are dietary restraint scales valid measures of dietary restriction? Additional objective behavioral and biological data suggest not. *Appetite*, 54, 331–339. <https://doi.org/10.1016/j.appet.2009.12.009>.
- Stunkard, A. J., & Messick, S. (1985). The Three-Factor Eating Questionnaire to measure dietary restraint, disinhibition and hunger. *Journal of Psychosomatic Research*, 29, 71–83. [https://doi.org/10.1016/0022-3999\(85\)90010-8](https://doi.org/10.1016/0022-3999(85)90010-8).
- Subramaniam, K., Low, W. Y., Chinna, K., Chin, K. F., & Krishnaswamy, S. (2017). Psychometric properties of the Malay version of the Dutch Eating Behaviour Questionnaire (DEBQ) in a sample of Malaysian adults attending a health care facility. *Malaysian Journal of Medical Sciences*, 24, 64–73. <https://doi.org/10.21315/mjms2017.24.4.8>.
- Tapper, K., Pothos, E. M., Fardari, J. S., & Ziori, E. (2008). Restraint, disinhibition and food-related processing bias. *Appetite*, 51, 335–338. <https://doi.org/10.1016/j.appet.2008.03.006>.
- Tiggemann, M., & Rüütel, E. (2001). A cross-cultural comparison of body dissatisfaction in Estonian and Australian young adults and its relationship with media exposure. *Journal of Cross-Cultural Psychology*, 32, 736–742. <https://doi.org/10.1177/0022022101032006007>.
- van Strien, T., Frijters, J. E. R., Bergers, G. P. A., & Defares, P. B. (1986). The Dutch Eating Behavior Questionnaire (DEBQ) for assessment of restrained, emotional, and external eating behavior. *International Journal of Eating Disorders*, 5, 295–315. [https://doi.org/10.1002/1098-108X\(198602\)5:2<295::AID-EAT2260050209>3.0.CO;2-T](https://doi.org/10.1002/1098-108X(198602)5:2<295::AID-EAT2260050209>3.0.CO;2-T).
- van Strien, T., Herman, C. P., & Verheijden, M. W. (2014). Dietary restraint and body mass change. A 3-year follow up study in a representative Dutch sample. *Appetite*, 76, 44–49. <https://doi.org/10.1016/j.appet.2014.01.015>.
- Viana, V., & Lourenço, S. (2003). Estilo alimentar: adaptação e validação do questionário holandês do comportamento alimentar. *Psicologia: Teoria, Investigação e Prática*, 26, 59–71.
- Wang, Y.-F., Ha, S., Zauszniewski, J. A., & Ross, R. (2018). Psychometric properties of the Chinese version of the Dutch Eating Behavior Questionnaire in a sample of Taiwanese parents. *Obesity Research & Clinical Practice*, 12, 129–132. <https://doi.org/10.1016/j.orcp.2017.11.005>.
- Wardle, J. (1986). The assessment of restrained eating. *Behaviour Research and Therapy*, 24, 213–215. [https://doi.org/10.1016/0005-7967\(86\)90093-8](https://doi.org/10.1016/0005-7967(86)90093-8).
- Welch, E., Birgegård, A., Parling, T., & Ghaderi, A. (2011). Eating Disorder Examination Questionnaire and clinical impairment assessment questionnaire: General population and clinical norms for young adult women in Sweden. *Behaviour Research and Therapy*, 49, 85–91. <https://doi.org/10.1016/j.brat.2010.10.010>.
- Westenhoefer, J. (1991). Dietary restraint and disinhibition: Is restraint a homogeneous construct? *Appetite*, 16, 45–55. [https://doi.org/10.1016/0195-6663\(91\)90110-E](https://doi.org/10.1016/0195-6663(91)90110-E).
- Westenhoefer, J., von Katzler, R., Jensen, H.-J., Zyriax, B.-C., Jagemann, B., Harth, V., & Oldenburg, M. (2018). Cultural differences in food and shape related attitudes and eating behavior are associated with differences of Body Mass Index in the same food environment: Cross-sectional results from the Seafarer Nutrition Study of Kiribati and European seafarers on merchant ships. *BMC Obesity*, 5(1), 1–10. <https://doi.org/10.1186/s40608-018-0180-x>.
- WHO Expert Consultation. (2004). Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. *Lancet*, 363, 157–163. [https://doi.org/10.1016/S0140-6736\(03\)15268-3](https://doi.org/10.1016/S0140-6736(03)15268-3).
- Wu, S., Cai, T., & Luo, X. (2017). Validation of the Dutch Eating Behavior Questionnaire (DEBQ) in a sample of Chinese adolescents. *Psychology, Health & Medicine*, 22, 282–288. <https://doi.org/10.1080/13548506.2016.1173712>.
- Yucel, B., Polat, A., İkiz, T., Dugor, B. P., Elif Yavuz, A., & Sertel Berk, O. (2011). The Turkish version of the Eating Disorder Examination Questionnaire: Reliability and validity in adolescents. *European Eating Disorders Review*, 19, 509–511. <https://doi.org/10.1002/erv.1104>.

Zeeni, N., Gharibeh, N., & Katsounari, I. (2013). The influence of sociocultural factors on the eating attitudes of Lebanese and Cypriot students: A cross-cultural study. *Journal of Human Nutrition and Dietetics*, 26, 45–52. <https://doi.org/10.1111/jhn.12059>.