

Comparison of the Eating Disorder Inventory (EDI) in the Netherlands, Austria and Italy

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Objective: Comparison of scores of the Eating Disorder Inventory (EDI) in non-clinical females aged 15–35 years (total $n = 2402$) in three European countries with North–South variation.

Methods: Participants were high school girls from the Netherlands ($n = 642$), Austria ($n = 544$) and Italy ($n = 359$), and college students from the Netherlands ($n = 348$), Austria ($n = 114$) and Italy ($n = 395$).

Results: Age-dependent differences of EDI subscale scores were observed. Whereas in Dutch females weight and body shape concerns had a peak between 16 and 19 years, these concerns remained relatively constant in Italy and Austria. The Italian scores were significantly higher than the Dutch scores on almost all EDI subscales whereby effects were small or medium.

Conclusions: The scores may be influenced by socio-cultural factors, cultural traits, culture-specific social demands on young adults and differences in maturation between North and South Europe. National norms are necessary for different age, weight and sex groups. Copyright © 2008 John Wiley & Sons, Ltd and Eating Disorders Association.

Keywords: EDI; cross-cultural differences; Europe; eating disorders

The Eating Disorder Inventory (EDI-1, Garner & Olmsted, 1984; Garner, Olmsted, & Polivy, 1983; EDI-2, Garner, 1991) is a self-report questionnaire that measures behavioural and attitudinal dimensions common in anorexia nervosa (AN) and bulimia nervosa (BN). It has become a widely used instrument both for the assessment of symptoms in

clinical samples and for screening for eating disorders in non-clinical samples.

The EDI originally comprised 64 items forming eight scales. The three scales drive for thinness (DT), bulimia (B) and body dissatisfaction (BD) consist of items concerned with preoccupation with weight, tendency to binge and purge and unhappiness with the body shape, respectively. The five other scales reflect psychological dimensions which have been thought to be especially relevant to the aetiology of eating disorders: ineffectiveness (IN; feelings of inadequacy, insecurity), perfectionism

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(P; unrealistic standards for behaviour), interpersonal distrust (ID; avoiding intimate relationships), interoceptive awareness (IA; difficulties in recognizing and accurately identifying emotions) and maturity fears (MF; desire to retreat to the security of childhood). It was expanded in 1991 by Garner (EDI-2) with 27 additional items to form three new scales asceticism (A; virtue via denial or restraint), impulse regulation (IR; impulsivity and hostility) and social insecurity (SI; social self-doubt and unhappiness).

The EDI-1 and EDI-2, which were developed in North American (Canadian) population, have been translated into many languages. However, several concerns have to be taken into account if assessment instruments are translated and applied in different cultures (Van de Vijver & Hambleton, 1996). Tests which are highly reliable and valid in one culture may be unreliable and not valid in other cultures. A concept that exists in the source culture does not necessarily exist in the target culture. A behaviour which is considered pathological in one society may be normal in another one. If a certain trait is manifested in a different manner in the source culture the resulting scores can be misleading in the target culture. Therefore, the equivalence of the translated test with the original test regarding reliability, validity and comparability of the scores, as well as culture-specific meanings associated with the measured traits have to be evaluated and separate norms must be specified if necessary.

The findings of studies that investigated the reliability and validity of the EDI-1 and EDI-2 in different countries are inconsistent, especially for non-clinical samples. Whereas some studies reported good validity and reliability in non-clinical samples at least for the original EDI-1 (e.g. Lee, Lee, Leung, & Yu, 1997, for Hong Kong; Rathner & Rumpold, 1994; Rathner & Waldherr, 1997, for Austria) others found rather low validity and reliability data even for US samples (e.g. Bennett & Stevens, 1997; Klemchuk, Hutchinson, & Frank, 1990; Shore & Porter, 1990) and also for German samples (Thiel & Paul, 1988). Therefore, this cannot be attributed solely to inadequate translation. Some researchers (Schoemaker, van Strien, & van der Staak, 1994) suggest that the lack of validity of the EDI in non-clinical samples is due to the transformation of the item scores from a 6-point Likert scale to a 4-point scale (0 through 2 points = 0; 3 = 1, 4 = 2, 5 = 3) as proposed by Garner et al. (1983). They showed that the internal consistencies and the factorial integrity could be improved by using untransformed scores at least for non-clinical Dutch

adolescents. This finding had been confirmed by Van Strien and Ouwens (2003) as well as Lee et al. (1997) and Machado, Gonçalves, Martins & Soares (2001) who as well found better factorial integrity and internal consistencies with untransformed scores.

Previous comparisons of EDI scores with the North American norms yielded cultural diversities. Lower scores for perfectionism were reported for Swedish (Norrington & Sohlberg, 1988) and Japanese (Pike & Mizushima, 2005; Tachikawa et al., 2004) samples. Furthermore, Van Strien and Ouwens (2003) found lower scores for Dutch high school girls in body dissatisfaction and perfectionism as well as in drive for thinness and perfectionism for college students and higher scores in ineffectiveness, interpersonal distrust and interoceptive awareness compared with the respective normative samples published in the EDI-2 manual by Garner (1991). A Dutch clinical sample scored higher on most scales, except drive for thinness which was approximately similar, and bulimia and perfectionism which were lower. For German females lower scores on drive for thinness, body dissatisfaction, perfectionism, ineffectiveness and interoceptive awareness were reported (Steinhausen, Neumärker, Vollrath, Dudeck, & Neumärker, 1992). Therefore, it was concluded that there could be cultural differences between North America, Europe and Asia.

The aim of the present study was the comparison of EDI scores in non-clinical samples in three European countries with North-South variation and different languages and cultures (the Netherlands, Austria and Italy) to explore if there exist cultural differences even within Europe and to investigate the possibility of common European norms.

METHODS

Participants

The lower age limit of participants in Italy was 15 years. Therefore also in the Netherlands (NL) and Austria only females 15 years and older were included in the statistical analyses. The total sample included 1545 high school females and 857 female college students, in all 2402 persons. In NL 642 high school females ≥ 15 years (mean age: 16.66 years, $SD = 1.25$) participated, in Austria 544 (mean age: 16.21 years, $SD = 1.26$) and in Italy 359 (mean age: 16.07, $SD = 0.76$). The mean age of the 348 college students from NL was 21.76 years ($SD = 4.58$), the mean age of the 114 Austrian

college students was 21.8 years ($SD = 4.96$) and the 395 Italian college students was 20.18 years on the average ($SD = 0.75$).

Instrument

The EDI had been translated into Dutch, German and Italian languages, respectively, and after re-translation and following back into English, professional translators did not find any meaningful differences (back-translation method; see, for instance, Brislin, 1986).

The reliability and validity of the EDI-2 in the Dutch samples was evaluated in a prior study (Van Strien & Ouwens, 2003) by means of internal consistency of the subscales (Cronbach α s) and factor analyses. In the sample of college students the original eight EDI-1 scales except interoceptive awareness could be identified; only the items of this subscale did not form a distinct factor. The Cronbach α for the scales were between .75 and .94. In the sample of high school girls less support for the factorial integrity of the EDI-1 was found. The three new scales could not be replicated, and the Cronbach α s ranged between .66 and .69.

The results of the psychometric properties of the German version (Rathner & Waldherr, 1997) are comparable to those of the Dutch version. Cronbach α for the original eight scales of the EDI-1 for high school girls older than 14 ranged from .66 to .93. The factor structure was clearly identifiable, however, drive for thinness and body dissatisfaction collapsed into one factor. Again there was no support for the three new scales. Cronbach α for them ranged between .57 for asceticism and .79 for impulse regulation.

Detailed results of the validation of the Italian language version by means of factor analysis and internal consistency are given by Santonastaso and Favaro (1995). The EDI appeared to be internally consistent and valid in clinical and non-clinical samples. All eight factors could be confirmed by using principal component analysis in a clinical sample. The reliability of the eight subscales of the EDI-1 was good even in non-clinical samples. Cronbach α ranged between .68 and .92.

Procedure

In all three countries participation was voluntary and anonymous. Although data were collected within the same period in the three countries, participants in Italy filled in the EDI-1, and participants in NL and Austria the EDI-2. High-school girls completed the questionnaire with

permission from school authorities and parents under supervision of both a teacher and a researcher during a lesson. The high school females from NL were from six different schools in the area of Nijmegen (city in the east of NL with $\sim 160\,000$ residents). The high school sample from Austria was recruited from 16 randomly selected schools in Lower Austria (urban and suburban area around Vienna; largest town: $\sim 50\,000$ residents). The respective participants in Italy were females attending the second year of two vocational training schools in Padova (city in the north of Italy with $\sim 200\,000$ residents). The college students were recruited at the universities of Nijmegen (NL), Vienna (A; $\sim 1\,500\,000$ residents) and Padova (I). The college sample from NL filled in the EDI-2 as part of larger studies on eating behaviour, the sample from Austria (mainly psychology students) during waiting times between lectures. The Italian college sample was recruited in student hostels. The students were invited to participate to a meeting about eating disorders whereby the questionnaires were completed at the beginning of the meeting.

Statistical Analyses

Due to previously reported age differences in EDI scores (see, for instance, Garner, 1991; Rathner & Waldherr, 1997; Shore & Porter, 1990; Van Strien & Ouwens, 2003) three age groups were formed (15–15.9 years: $n_{(NL-A-I)} = 144-211-214$; 16–18.9 years: $n_{NL-A-I} = 487-302-147$; 19 years and older: $n_{NL-A-I} = 359-145-393$). BMI was calculated and participants were grouped into underweight, normal weight and overweight whereby for adolescents younger than 19 years BMI percentiles ($<P25$, $P25-P75$, $>P75$) from Germany were used as reference (Arbeitsgemeinschaft Adipositas im Kindes- und Jugendalter, 2004). For adolescents the BMI distributions did not differ significantly across countries. In all three countries 30–40% of the females younger than 19 years were underweight, approximately 50% normal weight and 10–20% overweight. However, the BMI distributions of the young adult women differed significantly ($p < .001$). In NL the percentage of overweight was higher (NL: 15.2%, Austria: 7%, Italy: 4.1%) and underweight was less frequent (NL: 28.9%, Austria: 41.2%, Italy: 43.7%). Therefore, BMI was taken into account by examining the differences across countries separately for the three weight groups.

All analyses were done both with untransformed EDI scores (0–5) and transformed scores. If one or more item(s) was not answered the subscale score

was not calculated, but coded as missing. Due to non-normal distributions of most subscale scores nonparametric methods had to be used. Median and quartiles were used as descriptive statistics, Kruskal–Wallis H -tests and Mann–Whitney U -tests were used to compare groups separately in each age–weight–group combination. Due to this multiple testing procedure $\alpha = .01$ was chosen as significance level. Since the sample sizes were smaller in the under- and overweight groups than in the normal weight groups, and thus statistical power for the single statistical tests was different, η^2 (for H -tests) and point-biserial correlations r_{pb} (for U -tests) were calculated as effect size measures of group differences. According to Cohen (1988) $r_{pb} = .10$ is defined as small, $.30$ as medium and $.50$ as large effect, and values of $.01$, $.06$ and $.14$ for η^2 as small, medium and large effect, respectively.

RESULTS

Comparison of EDI Scores Between the Three Countries

The statistical tests yielded no significant differences across the countries in body dissatisfaction for all age and weight groups. An examination of descriptive statistics and effect sizes (for the normal weight group given in Table 1) showed only small effects for underweight and normal weight girls younger than 16 years. Dutch girls were slightly more satisfied with their body shape than Italian girls ($r_{pb(uw)} = .21$ and $r_{pb(nw)} = .10$) and Austrian girls (both $r_{pb} = .13$). On drive for thinness the Italian and Austrian adolescents younger than 19 years with normal weight scored significantly higher than the Dutch girls ($p < .001$; $r_{pb} = .27$ and $.34$ for Italy–NL; and $r_{pb} = .34$ and $.27$ for Austria–NL). Statistical tests yielded no significant differences for under- and overweight girls; effect sizes r_{pb} were between $.16$ and $.28$. Pairwise comparisons between the countries by means of Mann–Whitney U -tests showed that the Austrian scores were comparable to the Italian scores. In young women 19 years and older only the normal weight Italian women had significantly higher scores than Dutch women ($r_{pb} = .22$). For the Austria–NL comparison the effect size r_{pb} was $.14$. In Austria and Italy unhappiness with body shape and preoccupation with weight did not differ significantly between the age groups and effect sizes η^2 were $< .02$ in all weight groups. For normal weight females in NL body dissatisfaction was highest in adolescents

between 16 and 19 years ($p = 0.006$, $\eta^2 = 0.021$) and in underweight females drive for thinness was highest in young adults ($p < .001$, $\eta^2 = 0.062$).

For the third symptom subscale bulimia, which assesses the tendency to binge and purge, the scores were highest in Italy in all age groups in underweight and normal weight females, and comparable for Austria and NL (see Table 1). The scores of the Dutch females of all age and weight groups were also significantly lower than the Italian scores in the psychological dimensions perfectionism and maturity fears (effect sizes r_{pb} between $.14$ and $.48$). The Austrian scores were in between, whereby perfectionism was significantly higher in Austrian adolescents between 16 and 18.9 years than in Dutch adolescents ($r_{pb} = .18$), and maturity fears were comparable in Austria and NL for all age groups. Since perfectionism increased with age in NL ($p < .001$) the effect sizes were smaller in adults. Interpersonal distrust was higher in Italian adolescents younger than 19 years in all weight groups compared to Austrian and Dutch adolescents. Whereas this dimension was constant across age groups in A and NL the scores decreased with age in I ($p < .001$). For interoceptive awareness the Italian scores were higher than the Dutch scores in normal weight adolescents between 16 and 18.9, and underweight as well as normal weight young women. For most subscales, the Austrian scores were between the Dutch and Italian scores; one exception is ineffectiveness. In this dimension the Austrian females scored lowest in the youngest age group; however, this difference vanished with age. For the three new scales of the EDI-2 significant differences between Austrian and Dutch females again vary with age. Whereas for impulse regulation the scores of the Austrian under- and normal weight adolescents younger than 19 years were higher, for social insecurity the Dutch scores were higher. Asceticism was higher in the Dutch females in all age groups.

Comparison of European Scores with North American Scores

Medians of the transformed EDI-1 subscale scores for the three countries were compared with the respective normative data obtained from Garner (1991). For female adolescents between 15 and 18.9 years scores from Austria were most similar to the North American norms. All subscale medians were between percentile ranks (PR) 41 and 64 of the Canadians. The Italian scores were higher for interpersonal distrust and especially maturity fears

Table 1. Descriptive statistics (median and quartiles) for untransformed subscale scores of the EDI-1 in Italy and the EDI-2 in Austria and the Netherlands in the normal weight group

	15-15.9 years						16-18.9 years						19 years and older						Age group differences				
	NL		I		χ^2		NL		A		I		χ^2		NL		A			I		χ^2	
	8.5	14	13	18.5**	12	17	27.10**	9	14	13	16.69**	NL (5)	8.5	14	13	16.69**	6-15	8.75-17.25		8-21	12.5	(2,3)	I (5)
DT	5.75-13	8-22	7-19	(2,3 ⁺ ,5)	7-17	11-21	(2,3 ⁺ ,5,6)	12	16	17	11-21	(2,3 ⁺ ,5,6)	12	16	17	27.10**	6-15	8.75-17.25	8-21	12.5	(2,3)	19.44**	I (5)
B	3	4	7	33.57**	4	8	19.44**	4	4	8	4-13	(1,2,5)	2-8	2-8	4-13	(1,2,5)	3	4	8	77.09**	(1 ⁺ ,2 ⁺ ,5)	77.09**	
BD	1-6	1-8	4-9.5	(1,2 ⁺ ,5)	2-8	25.5	(1,2,5)	2-8	2-8	25.5	18.75-35	0.11	28	27	25.5	0.11	1-7	2-7.25	4-12	26.5	5.24	5.24	NL*
BD	23	26	26	2.72	20-35	18.75-35	0.11	20-33.25	20-33.25	18.75-35	18.75-35	0.11	20-33.25	20-33.25	18.75-35	0.11	17.75-31	18-32	20-33	20-33	5.24	5.24	NL*
IN	17-33	19-36.75	18-34	(1,2)	15	14	9.98*	15	14	14	9.98*	9.98*	15	14	14	9.98*	14	13	15	15	1.7	1.7	
IN	16	13	17	15.45**	11-21	8-20	(4)	11-21	8-18.75	8-20	8-20	(4)	11-21	8-18.75	8-20	(4)	9.75-19	9-18	9.5-21	9.5-21	19.06**	19.06**	NL** (5,6)
P	9-19.5	8-17.25	13-22	(1,4)	8	12	22.22**	8	10	12	9-16	(2,3,5,6 ⁺)	5-12	7-14	9-16	(2,3,5,6 ⁺)	10	12	12.5	12.5	(2,5,6)	(2,5,6)	I (5 ⁺)
P	9	10	11.5	11.87*	5-12	9-16	22.22**	5-12	7-14	9-16	9-16	(2,3,5,6 ⁺)	5-12	7-14	9-16	(2,3,5,6 ⁺)	7-14	8-16	9-16	12	1.68	1.68	I**
ID	5-12	6-14	8-15	(2 ⁺ ,5 ⁺ ,6 ⁺)	13	16	29.64**	13	11	16	12-20	(1 ⁺ ,2,5)	9-16	7-15.25	12-20	(1 ⁺ ,2,5)	8-15	8-17	8-17	12	21.67**	21.67**	(5)
ID	11	11	16	32.69**	9-16	18	11.44*	9-16	7-15.25	12-20	12-20	(1 ⁺ ,2,5)	9-16	7-15.25	12-20	(1 ⁺ ,2,5)	8-15	8-17	8-17	16	1.68	1.68	I
IA	8-15	7-15	12-20	(1,2 ⁺ ,5,6)	14	18	11.44*	14	15	18	13-24	(2)	14	15	18	11.44*	13	13	16	16	21.67**	21.67**	I
IA	13.5	14	16	7.13	10-18	13-24	(2)	10-18	11-19.75	13-24	13-24	(2)	10-18	11-19.75	13-24	(2)	10-17	10-18	11-22	18	53.68**	53.68**	(5)
MF	9-17.75	9-21	12-20	32.08**	15	19	34.36**	15	15	19	16-23	(1 ⁺ ,2 ⁺ ,5 ⁺ ,6 ⁺)	15	15	19	34.36**	15	14	18	18	53.68**	53.68**	(5)
MF	16	15	19	32.08**	12-18	16-23	(1 ⁺ ,2 ⁺ ,5 ⁺ ,6 ⁺)	12-18	12-19	16-23	16-23	(1 ⁺ ,2 ⁺ ,5 ⁺ ,6 ⁺)	12-18	12-19	16-23	(1 ⁺ ,2 ⁺ ,5 ⁺ ,6 ⁺)	12-18	11-18	15-21	15-21	44.02**	44.02**	A** (5)
A	12-18	13-20	16-23	(1 ⁺ ,2 ⁺ ,5 ⁺ ,6)	12	9	40.99**	12	9	9	40.99**	40.99**	11	7	11	40.99**	11	7	7	7	44.02**	44.02**	A** (5)
A	13	10	10	7.68*	10-15	6-12	(4,5)	10-15	6-12	6-12	6-12	(4 ⁺ ,5,6)	9-15	4-9.25	9-15	(4 ⁺ ,5,6)	9-15	4-9.25	4-9.25	15	1.52	1.52	NL**
IR	8-15	6.5-13	15	(4,5)	14	16	8.36*	14	16	16	8.36*	8.36*	12.5	15	15	8.36*	12.5	15	15	15	1.52	1.52	NL**
IR	10.5	15	17.24**	(4,5,6)	10-18	11.25-21.75	(3,5)	10-18	11.25-21.75	11.25-21.75	11.25-21.75	(3,5)	10-17	10-17	10-17	(3,5)	10-16	10-17	10-17	14	0.25	0.25	NL**
SI	8-16	11-21.5	13	(4,5,6)	15	13	12.83**	15	13	13	12.83**	12.83**	13	14	14	12.83**	13	14	14	14	0.25	0.25	NL*
SI	15	13	13	5.56	12-19	10-17	(4)	12-19	10-17	10-17	10-17	(4)	11-17	10-18	10-17	(4)	11-17	10-18	10-18	14	0.25	0.25	NL*
SI	11.25-19	9-18	9-18	5.56	12-19	10-17	(4)	12-19	10-17	10-17	10-17	(4)	11-17	10-18	10-17	(4)	11-17	10-18	10-18	14	0.25	0.25	NL*

NL, Netherlands; A, Austria; I, Italy; DT, drive for thinness; B, bulimia; BD, body dissatisfaction; IN, ineffectiveness; P, perfectionism; ID, interpersonal distrust; IA, interoceptive awareness; MF, maturity fears; A, asceticism; IR, impulse regulation; SI, social insecurity.

* $p < .01$.

** $p < .001$; (1), Italy > Austria, small effect size, (2), I > NL, small effect size, (3), Austria > NL, small effect size; (4), NL > Austria small effect size; (5), small effect also in underweight group; (6), small effect also in overweight group.

[†]Medium effect size.

with medians \geq PR75 of the North American norms; i.e. less than 25 per cent of the North American population would have a higher score. The Dutch scores were lower for drive for thinness, and especially perfectionism with medians \leq PR 30.

The young women 19 years and older from all European countries had slightly lower scores in perfectionism and asceticism, and slightly higher scores in ineffectiveness, interpersonal distrust and interoceptive awareness. The greatest difference was observable for maturity fears which are high in all three European countries compared to the normative samples (PR \geq 75). Especially the Italian scores were extremely high. Only 6% of the respective North American population would have a score as high as the Italian median score.

DISCUSSION

The comparison of the EDI in three European countries with North-South variation separately for three age groups and three weight groups yielded some further insights into cultural diversities regarding behaviours and attitudes relevant to the determination of eating disorders and confirm previous recommendations for national validation of assessment instruments (see, for instance, O'Keefe & Lovell, 1999; Rathner & Waldherr, 1997). The results of this study show that cultural differences vary with age of the adolescents. Whereas for normal weight Dutch females, unhappiness with the body was different across age groups with a peak between 16 and 19 years, these concerns were relatively constant in the two southern countries. This could be due to differences in maturation between North, Central and South Europe. During puberty the physical changes (i.e. fat increase) enlarge the discrepancy between the Western idealized body shape and the own body and may result in body dissatisfaction (Dorn, Crockett, & Petersen, 1988). Furthermore, this period is the most common time of onset of heterosocial activities (dating, first sexual experiences). Previous studies reported an association between these developmental changes during adolescence and body dissatisfaction and dieting (Cauffman & Steinberg, 1996; Dorn et al., 1988; Gralen, Levine, Smolak, & Murnen, 1990) suggesting the most significant linkage in mid adolescence. On the other hand, a North-South variation in menarcheal age has been observed (Danker-Hopfe, 1986; Thomas, Renaud, Benefice, Meeüs, & Guegan, 2001). The most immediate reported median age at menarche for

NL is 13.15 years (Fredriks et al., 2000), and the mean age for Italy is 12.2 years (Zoppi, 1992). For Austria there is no study available; the median age at menarche for the neighbouring countries Germany and Switzerland is 13.0 years (Morabia, Khatchatria, Bernstein, Walker, & Campana, 1996; Ostersehl & Danker-Hopfe, 1991). Drive for thinness was significantly higher in Italy and Austria than in NL for normal weight adolescents of all age groups; however, effect sizes were smaller in adults. The comparison with normative data given in Garner (1991) shows that the scores of the southern countries are comparable to the North American and that therefore the preoccupation with weight seems to be less prevalent in NL than in North America and central and southern parts of Europe. Furthermore, the Dutch females of all age groups scored lower than Italian females on bulimia, perfectionism, interoceptive awareness and maturity fears. For bulimia and interoceptive awareness, the Italian scores were slightly higher than the US scores. Maturity Fears were high compared to US norms in all three European countries in all age groups. Significantly greater maturity fears and sense of ineffectiveness were also reported for Japan (Pike & Mizushima, 2005; Tachikawa et al., 2004). The Austrian and Italian scores in perfectionism were in the norm for 15–18.9 year old females compared with the North American normative data, and lower for young women older than 19. The Dutch scores were lower for all age groups (see also Van Strien & Ouwens, 2003). A lower perfectionism in comparison to the Canadian samples was also reported for a Swedish sample (Norrington & Sohlberg, 1988) and Japanese samples (Pike & Mizushima, 2005; Tachikawa et al., 2004). A comparison between Russian and British female students yielded higher scores for the Russian sample (O'Keefe & Lovell, 1999) which might be due to an over identification with Western ideals (see also Rathner et al., 1995). These results for the psychological dimensions of the EDI might again be due to differences in maturation. Earlier onset of puberty may not be matched by earlier social development. If social development lags behind physical development, understanding their role in society might be more complicated for adolescents and result in psychological distress. The greater the mismatches between physical development and social development, the greater the adolescent distresses might be (Bellis et al., 2006). Cultural differences in social demands on adolescents and young adults, especially differences in expectations on young women to achieve

autonomy, might influence the dissociation of physical and social puberty. In interpreting the differences to the normative data given in Garner (1991) caution is necessary, because they stem from the 1980s, and there may have been also a change of EDI scores over time.

In conclusion, the results of this study showed age-dependent cultural diversities in the dimensions measured by the EDI whereby effect sizes were of small or medium size. It is concluded that the differences between the countries are not caused by inadequate translation (Pook, Tuschen-Caffier, & Kaufmann, 2006). They might be due to the North–South gradient in maturation which may interact with socio-cultural factors and cultural traits. Presumably a greater gap between physical maturation, social developmental stage and social demands results in higher psychological distress. Therefore, national norms are necessary for different age, weight and sex groups.

A limitation of the study is the lower age limit of 15 years. Thus, interpretations on the influence of maturation are only tentative and further exploration of the association between onset of puberty, culture-specific social demands and meanings of behaviour and psychological states and traits associated with eating disorders are warranted.

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