



A German version of the Night Eating Questionnaire (NEQ): Psychometric properties and correlates in a student sample



Adrian Meule^{a,b,*}, Kelly C. Allison^c, Petra Platte^a

^a Institute of Psychology, University of Würzburg, Würzburg, Germany

^b Hospital for Child and Adolescent Psychiatry, LWL University Hospital of the Ruhr University Bochum, Hamm, Germany

^c Department of Psychiatry, Perelman School of Medicine at the University of Pennsylvania, Philadelphia, USA

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ABSTRACT

Night eating syndrome (NES) is marked by substantial evening or nocturnal food intake, insomnia, morning anorexia, and depressed mood. The Night Eating Questionnaire (NEQ) is the most frequently used instrument for the assessment of NES and available in several languages. The current study aimed at providing and validating a German version of the NEQ using an online study among students ($N = 729$). The German NEQ had acceptable internal consistency ($\alpha = .71$) and three-week retest-reliability ($r = .77$). The four-factor structure of the original version (morning anorexia, evening hyperphagia, mood/sleep, nocturnal ingestions) could be replicated, except for one item. Convergent validity was supported by moderate positive correlations with eating pathology, emotional eating, and habitual food cravings. Discriminant validity was supported by small positive correlations with relevant, but not eating-related constructs (eveningness preference, impulsivity). Scores on the NEQ were also positively, but weakly, correlated with body mass index ($r = .18$). The German version of the NEQ appears to be a useful tool for future investigations on night eating.

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1. Introduction

Night eating syndrome (NES) was first described as a pattern of night eating behaviors among obese individuals (Stunkard, Grace, & Wolff, 1955). Although there is a positive relationship between night eating severity and body mass index (BMI), night eating also occurs in non-obese individuals (Vander Wal, 2012). NES is not yet widely recognized by eating disorder professionals (Goncalves, Moore, Stunkard, & Allison, 2009; Vandereycken, 2011), but is now listed in the *Otherwise Specified Feeding and Eating Disorders* section of the fifth revision of the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 2013). Proposed research diagnostic criteria include (1) consumption of $\geq 25\%$ of daily food intake after the evening meal or at least two nocturnal ingestions per week, (2) awareness of those eating episodes, and (3) at least three of the following: morning anorexia, a strong urge to eat between dinner and sleep or at night, insomnia, a belief that one must eat in order to initiate or return to sleep, and/or a worsening of mood in the evening (Allison et al., 2010).

The Night Eating Questionnaire (NEQ) is the most widely used screening instrument for NES. It consists of four subscales:

morning anorexia, evening hyperphagia, mood/sleep, and nocturnal ingestions (Allison et al., 2008). The NEQ has adequate internal consistency and retest-reliability across different versions (Allison et al., 2008; Dantas et al., 2012; Harb, Caumo, & Hidalgo, 2008; Moizé et al., 2012). Two diagnostic cut-off scores of 25 (high sensitivity) and 30 (high specificity) have been proposed (Allison et al., 2008).

There is a strong overlap between NES and other eating disorders, for example binge eating disorder (BED; Fischer, Meyer, Hermann, Tuch, & Munsch, 2012; Grilo, Milsom, Morgan, & White, 2012). Accordingly, NEQ scores are positively correlated with binge eating frequency and general eating disorder pathology (Allison et al., 2008; Harb et al., 2012). Most recently, night eating was found to be correlated with other measures associated with overeating such as emotional and external eating (Nolan & Geliebter, 2012). In line with their phase delay in energy consumption, night eaters tend to be evening types ("owls") (Lundgren, Allison, O'Reardon, & Stunkard, 2008). Accordingly, NEQ scores are correlated with higher eveningness preference (Harb et al., 2012).

The aim of the current study was to validate a German version of the NEQ. Thus, we conducted an online questionnaire study in a student sample. Based on the findings above, we expected to find acceptable internal consistency ($\alpha \geq .70$), adequate retest-reliability ($r \geq .80$), and replication of its four-factor structure. As an indication for convergent validity, we expected moderate-to-high positive correlations ($r \geq .30$) between the NEQ and general eating disorder pathology,

* Corresponding author at: University of Würzburg, Department of Psychology I, Marcusstr. 9-11, 97070 Würzburg, Germany. Tel.: +49 931 31 808 34; fax: +49 931 31 82424.

E-mail address: adrian.meule@uni-wuerzburg.de (A. Meule).

binge eating frequency, emotional eating, and trait food cravings. As an indication for discriminant validity, we expected small correlations ($r < .30$) between the NEQ and eveningness preference and trait impulsivity.

2. Material and methods

2.1. Participants and procedure

Student councils of several German universities were contacted by e-mail and asked to distribute the online study's link. As an incentive, three \times 50€ and five \times 20€ were raffled among participants who completed the study. A total of $N = 729$ participants (77.0% women, $n = 561$) completed all questions. Mean age was 23.55 years ($SD = 3.89$; range: 18–47) and mean BMI was 22.59 kg/m^2 ($SD = 4.24$; range: 15.62–68.04). Most participants were students (91.4%, $n = 666$). A subset of participants ($n = 424$) completed a retest after three weeks. However, data of only $n = 305$ participants could be used for analyses because individual codes of some participants did not correspond to the ones specified in the primary data collection.

2.2. Measures

2.2.1. Night Eating Questionnaire (NEQ)

The NEQ (Allison et al., 2008) is a 14-item instrument for the assessment of night eating behaviors (cf. Table 1). The questionnaire contains two stop criteria, that is, if items #9 or #12 are answered with zero the following questions are also scored with zero. The English version has an acceptable internal consistency of $\alpha = .70$ (Allison et al., 2008) and two-week retest-reliability of the Spanish version was $r = .86$ (Moizé et al., 2012). The English version of the NEQ was translated into German by the first and last author of the current manuscript. A bilingual speaker, who did not have any knowledge about the original version, translated the first draft of the German version back into English. Discrepancies between the back-translation and the original form were discussed and adjusted as necessary.

2.2.2. Mood Eating Scale (MES)

The MES (Jackson & Hawkins, 1980) is a 20-item instrument for the assessment of eating in response to different mood states. Internal consistency was $\alpha = .88$ in both the validation study (Jackson & Hawkins, 1980) and in the current study.

Table 1
Psychometric properties of the German Night Eating Questionnaire (NEQ).

Items	Factors				M	SD	r_{itc}
	Morning anorexia	Evening hyperphagia	Mood/sleep	Nocturnal ingestions			
1. How hungry are you usually in the morning? [Wie hungrig sind Sie morgens normalerweise?]	.84	-.02	-.08	-.05	1.92	1.15	.05
2. When do you usually eat for the first time? [Wann essen Sie normalerweise zum ersten Mal?]	.82	.05	.03	.00	0.64	0.66	.21
3. Do you have cravings or urges to eat snacks after supper, but before bedtime? [Haben Sie nach dem Abendessen, aber vor dem Zubettgehen, große Lust auf Snacks?]	.00	.85	.05	-.06	2.05	0.96	.34
4. How much control do you have over your eating between supper and bedtime? [Wie viel Kontrolle über Ihre Nahrungsaufnahme haben Sie zwischen Abendessen und Zubettgehen?]	-.03	.77	.11	.05	1.40	0.98	.39
5. How much of your daily food intake do you consume after suppertime? [Welchen Anteil Ihrer täglichen Nahrungsaufnahme konsumieren Sie nach dem Abendessen?]	.06	.74	-.15	.06	0.90	0.43	.31
6. Are you currently feeling blue or down in the dumps? [Sind Sie derzeit melancholisch oder deprimiert?]	-.07	.10	.77	-.12	1.11	1.03	.24
7. When you are feeling blue, is your mood lower in the: (...) [Wenn Sie deprimiert sind, ist Ihre Stimmung schlechter am: (...)]	-.11	-.02	.56	-.04	1.81	1.63	.11
8. How often do you have trouble getting to sleep? [Wie oft haben Sie Schwierigkeiten einzuschlafen?]	.14	-.10	.61	.18	1.02	0.84	.26
9. Other than only to use the bathroom, how often do you get up at least once in the middle of the night? [Wie oft stehen Sie nachts auf (Toilettengänge ausgenommen)?]	.13	-.06	.27	.47	0.45	0.83	.27
10. Do you have cravings or urges to eat snacks when you wake up at night? [Haben Sie Heißhunger oder den Drang zu essen, wenn Sie nachts aufwachen?]	-.05	.00	-.01	.90	0.09	0.42	.38
11. Do you need to eat in order to get back to sleep when you awake at night? [Müssen Sie essen, um wieder einzuschlafen zu können, wenn Sie nachts aufwachen?]	-.08	-.02	.00	.82	0.04	0.30	.34
12. When you get up in the middle of the night, how often do you snack? [Wenn Sie nachts aufstehen, wie oft essen Sie dann?]	-.03	.03	-.08	.92	0.06	0.26	.39
13. When you snack in the middle of the night, how aware are you of your eating? [Wenn Sie mitten in der Nacht essen, wie bewusst sind Sie sich über Ihr Essen?]	-	-	-	-	-	-	-
14. How much control do you have over your eating while you are up at night? [Wie viel Kontrolle haben Sie über Ihre Nahrungsaufnahme, wenn Sie nachts essen?]	.05	.05	-.03	.80	0.09	0.48	.36
15. How upsetting is your night eating to you? [Wie schlimm ist das nächtliche Essen für Sie?]	-	-	-	-	-	-	-
16. How much has your night eating affected your life? [Wie sehr hat das nächtliche Essen Ihr Leben beeinflusst?]	-	-	-	-	-	-	-
Total variance explained	10.7%	14.2%	9.7%	26.9%	-	-	-
α	.59	.71	.38	.85	-	-	-
M	2.56	4.34	3.93	0.74	-	-	-
SD	1.55	1.93	2.39	1.76	-	-	-
Range	0–8	0–10	0–11	0–13	-	-	-

Notes. Numbers in boldface indicate factor loadings $> .30$. Items #13, 15, and 16 are not included in the total score. Mean NEQ total score was $M = 11.58$ ($SD = 4.41$, range 2–34).

2.2.3. Food Cravings Questionnaire – Trait (FCQ-T)

The FCQ-T (Cepeda-Benito, Gleaves, Williams, & Erath, 2000) is a 39-item instrument for the assessment of the frequency and intensity of food craving experiences. The FCQ-T has several subscales but a very high internal consistency of $\alpha > .90$ (Cepeda-Benito et al., 2000; Meule, Lutz, Vögele, & Kübler, 2012). Thus, we only used the total score. Internal consistency was $\alpha = .97$ in the current study.

2.2.4. Eating Disorder Examination Questionnaire (EDE-Q)

The EDE-Q (Fairburn & Beglin, 1994) is a 28-item instrument for the assessment of eating disorder symptomatology within the past 28 days. Twenty-two items can be reduced to four subscales: *eating restraint*, *eating concern*, *weight concern*, and *shape concern* (Hilbert & Tuschen-Caffier, 2006). The remaining six questions assess the frequency of eating disordered behaviors. Internal consistencies of the subscales range between $\alpha = .85$ –.93 (Hilbert, Tuschen-Caffier, Karwautz, Niederhofer, & Munsch, 2007) and ranged between $\alpha = .81$ –.92 in the current study.

2.2.5. Morningness–Eveningness Questionnaire – reduced (rMEQ)

The rMEQ (Adan & Almirall, 1991) is a five-item short form of the MEQ (Horne & Östberg, 1976) for the assessment of circadian preference. Internal consistency is $\alpha = .72$ (Randler, 2013) and was $\alpha = .70$ in the current study.

2.2.6. Barratt Impulsiveness Scale – short form (BIS-15)

The BIS-15 (Spinella, 2007) is a 15-item short form of the BIS-11 (Patton, Stanford, & Barratt, 1995) for the assessment of impulsive behaviors. The BIS-15 consists of three subscales representing *non-planning*, *motor*, and *attentional impulsivity* (Meule, Vögele, & Kübler, 2011; Spinella, 2007). Internal consistencies of the subscales and total scale range between $\alpha = .68$ –.82 (Meule et al., 2011; Spinella, 2007) and ranged between $\alpha = .69$ –.80 in the current study.

2.3. Data analyses

Exploratory factor analysis with principal component analysis (PCA) was chosen to investigate the factor structure of the German NEQ. The number of factors for extraction was determined using the Kaiser-criterion (Kaiser, 1960) and parallel analysis (Horn, 1965). An oblique rotation was chosen because factors were expected to be correlated (Promax, $\kappa = 4$). Factor loadings $> .30$ were considered meaningful. Item variances of the NEQ strongly differed between items because of the stop criteria (cf. Table 1). Thus, we used the standardized Cronbach's alpha for evaluating internal consistency as recommended in the literature (Bühner, 2011, p. 241). Retest-reliability was evaluated with test–retest-correlation. Construct validity was determined by correlations with the respective questionnaires. All p -values are reported two-tailed.

3. Results

3.1. Prevalence of night eating and associations with participant characteristics

Using the cut-off score of 25 (Allison et al., 2008), prevalence of NES was 1.24% in the current sample. Age was unrelated to NEQ scores ($r = -.06$, ns). There was a small positive correlation between NEQ scores and BMI ($r = .18$, $p < .001$). Accordingly, overweight and obese participants ($BMI \geq 25 \text{ kg/m}^2$, $n = 143$) had a marginally significant higher prevalence of NES (2.80%) compared with under- and normal-weight participants ($BMI < 25 \text{ kg/m}^2$, $n = 586$, 0.85%, $\chi^2_{(1)} = 3.56$, $p < .06$). Women ($M = 11.76$, $SD = 4.52$) had higher NEQ scores than men ($M = 10.96$, $SD = 4.00$, $t_{(727)} = 2.06$, $p < .05$), but this effect was negligible ($\eta^2 = .01$).

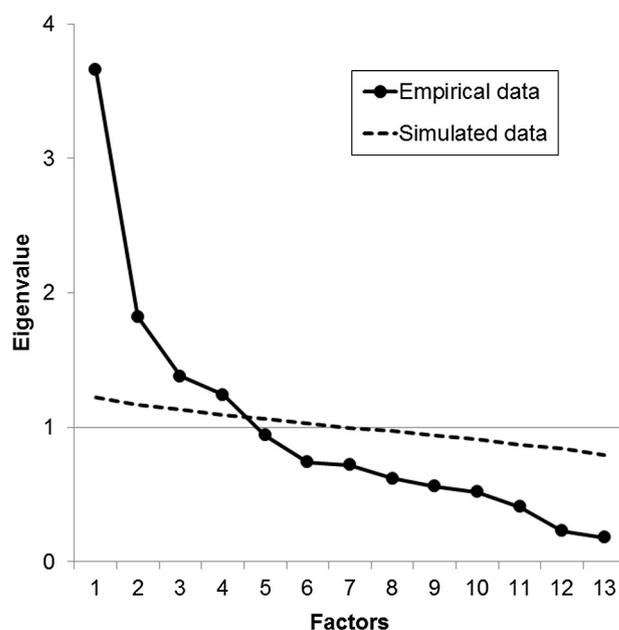


Fig. 1. Scree-plot of eigenvalues. Both the parallel analysis (dashed line) and the Kaiser-criterion (straight line) indicated extraction of four factors.

3.2. Factor structure

The Kaiser–Meyer–Olkin-coefficient ($KMO = .76$) and the Bartlett-test ($\chi^2_{(78)} = 2790.52$, $p < .001$) indicated that data were appropriate for exploratory factor analysis. Both parallel analysis and the Kaiser-criterion indicated the extraction of four factors (Fig. 1), explaining 61.43% of variance. See Table 1 for total variance explained by each factor and factor loadings. Overall, factor structure was similar to the original version (Allison et al., 2008), except that item #5 loaded on *evening hyperphagia* instead of *morning anorexia*. Subscales were positively correlated with each other ($rs = .16$ –.21, $ps < .001$) and with the total score ($rs = .58$ –.67, $ps < .001$), except *morning anorexia*, which was unrelated to the other subscales ($rs = -.02$ –.08) and also had the smallest correlation with the total score ($r = .37$, $p < .001$).

3.3. Reliability and item statistics

Internal consistency of the total scale was $\alpha = .71$ and varied between $\alpha = .38$ and $\alpha = .85$ for the subscales (Table 1). Retest-reliability was $r = .77$ ($p < .001$). Item statistics are displayed in Table 1.

3.4. Construct validity

Scores on the NEQ were moderately positively correlated with the EDE-Q total score ($r = .38$, $p < .001$) and its subscales *eating concern* ($r = .39$, $p < .001$), *weight concern* ($r = .36$, $p < .001$), and *shape concern* ($r = .37$, $p < .001$), number of binge days within the last 28 days ($r = .34$, $p < .001$), scores on the MES ($r = .32$, $p < .001$) and scores on the FCQ-T ($r = .39$, $p < .001$), and weakly positively correlated with the *restraint* subscale of the EDE-Q ($r = .25$, $p < .001$). That is, participants reported higher eating pathology, stronger emotional eating tendencies, and more frequent experiences of food craving with increasing night eating severity. Scores on the NEQ were weakly negatively correlated with the rMEQ ($r = -.20$, $p < .001$), indicating stronger eveningness preference with increasing night eating severity. Scores on the NEQ were weakly positively correlated with the BIS-15 total score ($r = .26$, $p < .001$) and its subscales *motor* ($r = .15$, $p < .001$) and *non-planning impulsivity* ($r = .11$, $p < .01$), and moderately positively correlated with the *attentional impulsivity* subscale ($r = .32$, $p < .001$). That is,

participants reported to be more impulsive, particularly with regard to attentional aspects, with increasing night eating severity.

4. Discussion

The aim of the current study was to provide a German translation and validation of the NEQ. Psychometric properties of the original version were largely replicated (Allison et al., 2008). Internal consistency of the total scale was acceptable, corresponding to versions in other languages (Allison et al., 2008; Dantas et al., 2012; Harb et al., 2008; Moizé et al., 2012). NEQ scores were highly correlated with scores after three weeks. Yet, retest-reliability was somewhat lower than previously reported ($r_{tt} > .80$; Moizé et al., 2012), which may be explained by the fact that a shorter, two-week retest-reliability was tested in that study.

Similar to the original version, a four-factorial structure was found. However, one item (“How much of your daily food intake do you consume after suppertime?”) loaded on the *evening hyperphagia* factor as opposed to loading on *morning anorexia* in the original version. It should be noted, however, that this item also loaded well on the *evening hyperphagia* subscale in the original version (Allison et al., 2008) and was included in the *evening hyperphagia* subscale in the Spanish NEQ (Moizé et al., 2012). As two of the four subscales had very low internal consistency, it may be advisable to only use the total score in future studies.

Using the cut-off score of 25, prevalence of NES was 1.24% in the current sample, which corresponds well to previously reported prevalence estimates (Vander Wal, 2012). Scores on the NEQ were positively correlated with BMI and, accordingly, prevalence of NES was higher among overweight and obese participants as compared to under- and normal-weight participants. Yet, effect sizes were small. Thus, results support findings about a positive relationship between night eating and body mass (Harb et al., 2012; Moizé et al., 2012). Of note, we investigated a sample of young students, which may have dampened the association between NEQ scores and BMI. Similarly, Runfola et al. (2014) found no relationship between BMI and night eating in their study of university students. However, it has been speculated that night eating may precede obesity and, thus, is not associated with higher body mass in younger adults but may predict future weight gain (Gluck, Venti, Salbe, & Krakoff, 2008; Marshall, Allison, O’Reardon, Birketvedt, & Stunkard, 2004). Likewise, we found that the relationship between NEQ and BMI was stronger in older participants of this study (Meule, Allison, & Platte, 2014).

Demonstrating convergent validity, scores on the NEQ were moderately positively associated with higher eating pathology such as binge or emotional eating, replicating prior studies (Allison et al., 2008; Harb et al., 2012; Nolan & Geliebter, 2012). Positive correlations with dietary restraint were small, which is reasonable considering that restraint is not a core feature of NES (Allison et al., 2010). Moreover, we could show that night eating severity is associated with more frequent experiences of food cravings, which is consistent with the finding that food cravings primarily occur in the late afternoon or evening (Hill, Weaver, & Blundell, 1991; Pelchat, 1997), and is one of the driving cognitions that persons with NES describe during their nocturnal eating episodes (Allison, Stunkard, & Thier, 2004).

Night eating was associated with circadian preference such that higher NEQ scores were related to a stronger eveningness preference, replicating a recent study (Harb et al., 2012). Although individuals with night eating exhibit a phase delay in food consumption and endocrine variables, they usually have a normal sleep–wake cycle (Goel et al., 2009; O’Reardon et al., 2004). Accordingly, the association between NEQ scores and circadian preference was weak.

Moreover, participants reported higher impulsivity with increasing night eating severity. Impulsivity has been related to a range of maladaptive behaviors, including over- or binge eating (Guerrieri,

Nederkoorn, & Jansen, 2008). This is the first study showing that impulsivity is also related to night eating. Interestingly, associations were strongest for *attentional impulsivity* – an aspect of impulsivity, which appears to be most consistently related to various measures of over- or binge eating (Meule, 2013). Of note, a recent study found that novelty seeking, which some researchers consider an aspect of impulsivity, was associated with binge eating, but not night eating in obese individuals (Dalle Grave et al., 2013). Thus, trait impulsivity may be a common risk factor for both binge and night eating, but future research may reveal that binge and night eating show differential relationships with specific aspects or the degree of impulsivity.

A major limitation of the current study is that all information was assessed via self-report, which is potentially biased (e.g., height and weight). Although discrepancies between self-report and objective measures exist, reports are usually sufficiently accurate (Bowman & DeLucia, 1992; Pursey, Burrows, Stanwell, & Collins, 2014). Moreover, scores on the EDE-Q highly correlate with those obtained through the EDE-Interview (Hilbert et al., 2007). Another issue is that web-based data collection can result in a selection or response bias (Mayr et al., 2012). However, numerous studies show that questionnaire scores obtained online are similar to those using paper-and-pencil versions, and that psychometric properties of questionnaires are not adversely affected by online assessment (Mayr et al., 2012; Naus, Philipp, & Samsi, 2009). On the contrary, anonymous, web-based data collection is even advantageous for the assessment of sensitive questions such as body weight and is particularly suitable in college populations (Kays, Gathercoal, & Buhrow, 2012; Kroh, 2005). Nevertheless, the current sample predominantly consisted of young, normal weight female students. Future studies in more representative or clinical German samples are necessary to replicate and extend the current findings.

To conclude, psychometric properties and correlates of the English and other versions of NEQ could largely be replicated in the current study. Thus, the German NEQ constitutes a useful self-report instrument for the assessment of night eating symptomatology in German-speaking countries.

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Contributors

AM and PP designed the study. AM conducted the statistical analysis and wrote the first draft of the manuscript. All authors were involved in writing and revising the manuscript and approved the final version.

Conflict of interest

All authors declare that they have no conflicts of interest.

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References

- Adan, A., & Almirall, H. (1991). Horne & Östberg morningness–eveningness questionnaire: A reduced scale. *Personality and Individual Differences, 12*, 241–253.
- Allison, K. C., Lundgren, J. D., O’Reardon, J. P., Geliebter, A., Gluck, M. E., Vinai, P., et al. (2010). Proposed diagnostic criteria for night eating syndrome. *International Journal of Eating Disorders, 43*, 241–247.
- Allison, K. C., Lundgren, J. D., O’Reardon, J. P., Martino, N. S., Sarwer, D. B., Wadden, T. A., et al. (2008). The Night Eating Questionnaire (NEQ): Psychometric properties of a measure of severity of the Night Eating Syndrome. *Eating Behaviors, 9*, 62–72.
- Allison, K. C., Stunkard, A. J., & Thier, S. L. (2004). *Overcoming Night Eating Syndrome: A step-by-step guide to breaking the cycle*. Oakland, CA: New Harbinger.
- American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). Washington, DC: American Psychiatric Association.
- Bowman, R. L., & DeLucia, J. L. (1992). Accuracy of self-reported weight: A meta-analysis. *Behavior Therapy, 23*, 637–655.

- Bühner, M. (2011). *Einführung in die Test- und Fragebogenkonstruktion* (3rd ed.). Munich: Pearson Studium.
- Cepeda-Benito, A., Gleaves, D. H., Williams, T. L., & Erath, S. A. (2000). The development and validation of the state and trait food-cravings questionnaires. *Behavior Therapy, 31*, 151–173.
- Dalle Grave, R., Calugi, S., Marchesini, G., Beck-Peccoz, P., Bosello, O., Compare, A., et al. (2013). Personality features of obese women in relation to binge eating and night eating. *Psychiatry Research, 207*, 86–91.
- Dantas, G. M., Pinto, T. F., Pereira, E. D. B., Júnior, R. M. M., de Bruin, V. M. S., & de Bruin, P. F. C. (2012). Validation of a new Brazilian version of the “Night Eating Questionnaire”. *Sleep Science, 5*, 7–13.
- Fairburn, C. G., & Beglin, S. J. (1994). Assessment of eating disorders: Interview or self-report questionnaire? *International Journal of Eating Disorders, 16*, 363–370.
- Fischer, S., Meyer, A. H., Hermann, E., Tuch, A., & Munsch, S. (2012). Night eating syndrome in young adults: Delineation from other eating disorders and clinical significance. *Psychiatry Research, 200*, 494–501.
- Gluck, M. E., Venti, C. A., Salbe, A. D., & Krakoff, J. (2008). Nighttime eating: Commonly observed and related to weight gain in an inpatient food intake study. *American Journal of Clinical Nutrition, 88*, 900–905.
- Goel, N., Stunkard, A. J., Rogers, N. L., Van Dongen, H. P. A., Allison, K. C., O’Reardon, J. P., et al. (2009). Circadian rhythm profiles in women with night eating syndrome. *Journal of Biological Rhythms, 24*, 85–94.
- Goncalves, M. D., Moore, R. H., Stunkard, A. J., & Allison, K. C. (2009). The treatment of night eating: The patient’s perspective. *European Eating Disorders Review, 17*, 184–190.
- Grilo, C. M., Milsom, V. A., Morgan, P. T., & White, M. A. (2012). Night eating in obese treatment-seeking Hispanic patients with and without binge eating disorder. *International Journal of Eating Disorders, 45*, 787–791.
- Guerrieri, R., Nederkoorn, C., & Jansen, A. (2008). The effect of an impulsive personality on overeating and obesity: Current state of affairs. *Psychological Topics, 17*, 265–286.
- Harb, A., Caumo, W., & Hidalgo, M. P. L. (2008). Translation and adaptation of the Brazilian version of the Night Eating Questionnaire. *Cadernos De Saude Publica, 24*, 1368–1376.
- Harb, A., Levandovski, R., Oliveira, C., Caumo, W., Allison, K. C., Stunkard, A., et al. (2012). Night eating patterns and chronotypes: A correlation with binge eating behaviors. *Psychiatry Research, 200*, 489–493.
- Hilbert, A., & Tuschen-Caffier, B. (2006). *Eating Disorder Examination – Questionnaire: Deutschsprachige Übersetzung*. Münster: Verlag für Psychotherapie.
- Hilbert, A., Tuschen-Caffier, B., Karwautz, A., Niederhofer, H., & Munsch, S. (2007). Eating Disorder Examination–Questionnaire: Evaluation der deutschsprachigen Übersetzung. *Diagnostica, 53*, 144–154.
- Hill, A. J., Weaver, C. F. L., & Blundell, J. E. (1991). Food craving, dietary restraint and mood. *Appetite, 17*, 187–197.
- Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika, 30*, 179–185.
- Horne, J. A., & Östberg, O. (1976). A self-assessment questionnaire to determine morningness–eveningness in human circadian rhythms. *International Journal of Chronobiology, 4*, 97–110.
- Jackson, L. J., & Hawkins, R. C., II (1980). Stress-related overeating among college students: Development of a mood eating scale. *Paper presented at the 26th Annual Convention of the Southwestern Psychological Association*.
- Kaiser, H. F. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement, 20*, 141–151.
- Kays, K., Gathercoal, K., & Buhrow, W. (2012). Does survey format influence self-disclosure on sensitive question items? *Computers in Human Behavior, 28*, 251–256.
- Kroh, M. (2005). Effects of interviews during body weight checks in general population surveys. *Gesundheitswesen, 67*, 646–655.
- Lundgren, J. D., Allison, K. C., O’Reardon, J. P., & Stunkard, A. J. (2008). A descriptive study of non-obese persons with night eating syndrome and a weight-matched comparison group. *Eating Behaviors, 9*, 343–351.
- Marshall, H. M., Allison, K. C., O’Reardon, J. P., Birketvedt, G., & Stunkard, A. J. (2004). Night eating syndrome among nonobese persons. *International Journal of Eating Disorders, 35*, 217–222.
- Mayr, A., Gefeller, O., Prokosch, H. U., Pirkl, A., Frohlich, A., & de Zwaan, M. (2012). Web-based data collection yielded an additional response bias-but had no direct effect on outcome scales. *Journal of Clinical Epidemiology, 65*, 970–977.
- Meule, A. (2013). Impulsivity and overeating: A closer look at the subscales of the Barratt Impulsiveness Scale. *Frontiers in Psychology, 4*(177), 1–4.
- Meule, A., Allison, K. C., & Platte, P. (2014). Emotional eating moderates the relationship of night eating with binge eating and body mass. *European Eating Disorders Review, 22*, 147–151.
- Meule, A., Lutz, A., Vögele, C., & Kübler, A. (2012). Food cravings discriminate differentially between successful and unsuccessful dieters and non-dieters. Validation of the Food Craving Questionnaires in German. *Appetite, 58*, 88–97.
- Meule, A., Vögele, C., & Kübler, A. (2011). Psychometric evaluation of the German Barratt Impulsiveness Scale – Short Version (BIS-15). *Diagnostica, 57*, 126–133.
- Moizé, V., Gluck, M. E., Torres, F., Andreu, A., Vidal, J., & Allison, K. (2012). Transcultural adaptation of the Night Eating Questionnaire (NEQ) for its use in the Spanish population. *Eating Behaviors, 13*, 260–263.
- Naus, M. J., Philipp, L. M., & Samsi, M. (2009). From paper to pixels: A comparison of paper and computer formats in psychological assessment. *Computers in Human Behavior, 25*, 1–7.
- Nolan, L. J., & Geliebter, A. (2012). Night eating is associated with emotional and external eating in college students. *Eating Behaviors, 13*, 202–206.
- O’Reardon, J. P., Ringel, B. L., David, F. D., Allison, K. C., Rogers, N. L., Martino, N. S., et al. (2004). Circadian eating and sleeping patterns in the night eating syndrome. *Obesity Research, 12*, 1789–1796.
- Patton, J. H., Stanford, M. S., & Barratt, E. S. (1995). Factor structure of the Barratt Impulsiveness Scale. *Journal of Clinical Psychology, 51*, 768–774.
- Pelchat, M. L. (1997). Food cravings in young and elderly adults. *Appetite, 28*(2), 103–113.
- Pursey, K., Burrows, T. L., Stanwell, P., & Collins, C. E. (2014). How accurate is web-based self-reported height, weight, and body mass index in young adults? *Journal of Medical Internet Research, 16*(1), e4.
- Randler, C. (2013). German version of the reduced Morningness–Eveningness Questionnaire (rMEQ). *Biological Rhythm Research, 44*, 730–736.
- Runfola, C. D., Allison, K. C., Hardy, K. K., Lock, J., & Peebles, R. (2014). Prevalence and clinical significance of night eating syndrome in university students. *Journal of Adolescent Health, 55*, 41–48.
- Spinella, M. (2007). Normative data and a short form of the Barratt Impulsiveness Scale. *International Journal of Neuroscience, 117*, 359–368.
- Stunkard, A. J., Grace, W. J., & Wolff, H. G. (1955). The night-eating syndrome – A pattern of food intake among certain obese patients. *American Journal of Medicine, 19*, 78–86.
- Vander Wal, J. S. (2012). Night eating syndrome: A critical review of the literature. *Clinical Psychology Review, 32*, 49–59.
- Vandereycken, W. (2011). Media hype, diagnostic fad or genuine disorder? Professionals’ opinions about night eating syndrome, orthorexia, muscle dysmorphia, and emetophobia. *Eating Disorders: The Journal of Treatment & Prevention, 19*, 145–155.