

ASSESSMENT OF EATING PATTERNS IN ADOLESCENTS VARYING BMI

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Assessment of eating patterns in adolescents. This study assesses the differences in eating patterns of a sample (n=608) of 15 to 17-year-old adolescents from the city of Barcelona (Spain) with varying BMI (seriously underweight <18kg/m², underweight 18-19.99kg/m², normal weight 20-24.99kg/m², overweight 25-29.99kg/m² and obese >30kg/m²). Our results appear not to support the existence of the hypothetical obese eating style. We observed a slightly restrained behaviour in overweight subjects and an unrestrained behaviour in underweight subjects. Our results suggest that the eating patterns of the sample differ markedly from those observed in most studies conducted predominantly in North American or northern European populations.

Se evalúan las diferencias en hábitos alimentarios de una muestra de 608 adolescentes de 15-17 años de la ciudad de Barcelona con diferentes niveles de IMC (infrapeso grave <18kg/m², bajo-peso 18-19.99kg/m², peso normal 20-24.99kg/m², sobrepeso 25-29.99kg/m² y obesidad >30kg/m²). La existencia del supuesto *estilo de alimentación obeso* no parece confirmarse con los datos obtenidos en nuestra muestra. Observamos unos hábitos ligeramente restrictivos en los sujetos con sobrepeso y unos hábitos poco restrictivos en sujetos con infrapeso. Los datos parecen indicar que los hábitos alimentarios de los sujetos de nuestra muestra son sustancialmente diferentes a los de estudios realizados con poblaciones norteamericanas y noreuropeas.

The study of eating patterns has been especially important in research on the problem of obesity, though it is undoubtedly of great relevance within the complex of variables that affect other disorders, such as bulimia and anorexia nervosa. Following the classic work of Ferster, Nurnberger and Levitt (1962), many of the studies in the 1960s and 70s examined in detail the eating patterns of different adult and child populations with the aim of confirming or rejecting the existence of the supposed *obese eating style*. According to this hypothetical style, obese subjects would differ from subjects with normal weight in the rhythm and speed of intake, the choice of foods, and the timetable and quantity of intake. More specifically, obese subjects, with respect to those of normal weight, would present a more rapid rhythm of intake, take larger and more frequent mouthfuls, chew each mouthful less, select higher-calorie foods, eat fewer times per day, but more copiously, and be more likely to "nibble" between meals (Dodd, Birky and Stalling; 1976; Drabman and Cordua, 1981; Ferster, Nurnberger and Levitt, 1962;

Hill and McCutcheon, 1975; Marston, London and Cooper, 1976; Price and Grinker, 1973; Stuart, 1967). This idea gave rise to Schachter's "theory of *externality*" (Schachter, 1968, 1971; Schachter, Goldman and Gordon, 1968), according to which obese subjects' intake would be more affected by external stimuli such as the time of day, the appearance of the food, its smell, its taste, etc. These ideas, in turn, had strong implications for the design of behavioural treatments of obesity with the introduction of stimulus control techniques.

Nevertheless, the great majority of reviews on aspects of the etiology or treatment of obesity coincide in concluding that there is not enough evidence to demonstrate the existence of such a style (Brownell and Wadden, 1991; Garner and Wooley, 1991; Rothblum, 1990; Stunkard, 1984; Wooley, Wooley and Dyrenforth, 1979). In spite of this, the study of eating patterns continues to generate interest, especially given the recent concern with the prevention of eating disorders. An important problem we have found is that there are scarcely any studies of eating patterns with adolescent populations, and that the lack of this type of study with Spanish populations is even more marked. Given the idiosyncratic nature of the eating behaviours of different populations, such research is well overdue.

We feel, however, that in research on eating patterns it would be especially interesting to take into account dif-

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ferent levels of relative weight, including underweight subjects. We believe that some of the controversies with regard to the existence or not of the supposed *obese eating style* have resulted from the excessively simplistic comparison of obese subjects with normal weight subjects.

In the present work we shall present the results of research carried out with a Spanish adolescent sample that studies differences in eating patterns between groups with different levels of body mass. This study was developed as part of the OBA project (OBA being the initial letters of Obesity, Bulimia and Anorexia), an epidemiological project carried out in Barcelona in the early 1990s by researchers at the University of Barcelona, *Universidad Aut3noma de Barcelona* and *Hospital Cl3nico de Barcelona*.

MATERIAL AND METHOD

Subjects

The sample included a total of 608 subjects from the seventeen schools and five technical schools in Barcelona that provided the total sample for the OBA project, and was representative of the 15-17 years age group. The schools were selected by a procedure of random sampling by groups (schools), selected proportionally on the basis of neighbourhood, type of school (state or private) and level of school (primary, secondary or technical). 57% were girls (348) and 43% boys (260), mean age being 15.54 years.

Material

Subjects' weight and height were recorded using a SICA-713 instrument, max. 130kg, min. 2kg, SD=0.2kg. The measurements were taken with subjects barefoot and wearing light clothes. After Saldaña (1994), the following relative weight levels were used, defined by the following intervals of Quetelet's Body Mass Index (BMI=kg/m²): seriously underweight <18kg/m², underweight 18-19.99kg/m², normal weight 20-24.99kg/m², overweight 25-29.99kg/m² and obese >30kg/m².

Age (years)	15	16	17	Total
Boys	134	93	33	260 (43%)
Girls	212	101	35	348 (57%)
Total	346	194	68	
	(57%)	(32%)	(11%)	

Eating patterns were assessed by means of a lifestyle questionnaire (LS) used in the OBA project. Many field studies have employed self-report measures for the assessment of eating patterns. As Straw and Rogers (1985) point out in their excellent review of the assessment of obesity, this technique is perfectly valid in this type of study, which presents enormous practical difficulties.

Self-report measures, when used for the assessment of eating patterns, have almost always been produced *ad hoc*, without their subsequent study. We are aware of the existence of some self-report instruments for the study of eating patterns with good psychometric characteristics, but which cover only a limited range of aspects, and are based on English-speaking populations, making them difficult to apply to our context (Straw and Rogers, 1985). The LS is a lifestyle questionnaire designed for our population. A factorial analysis with VARIMAX rotation was carried out, and from which a series of factors explaining 60.6% of the total variability was obtained. After a content analysis the following factors of

Table 2
Factors of the LS questionnaire obtained after the analysis of content of the initial factors extracted using a procedure of Varimax Factorial Analysis

- 1. EXTERNALITY**
 - Eating when you see food adverts on TV or in a magazine
 - Nibbling from other plates
 - Eating when you pass a cake shop, sweet shop or food shop displaying things you like
 - Eating when a tasty dessert is brought to the table, even though you have just eaten and are "full"
 - Eating when you see others eating
 - Eating when your friends invite you to eat something you like a lot, even though you aren't hungry
 - Eating when you find something you really like sitting on the kitchen table
 - Eating when you open the refrigerator see something you really like
- 2. REDUCTION IN INTAKE DUE TO NEGATIVE EMOTIONAL STATES**
 - Eating less or not eating because you are angry
 - Eating less or not eating because you are sad or depressed
 - Eating less or not eating because you are lonely
 - Eating less or not eating because you are nervous
 - Eating less or not eating because you are bored
- 3. INCREASE IN INTAKE DUE TO NEGATIVE EMOTIONAL STATES**
 - Eating because you are angry
 - Eating because you are sad or depressed
 - Eating because you are lonely
 - Eating because you are nervous
 - Eating because you are bored
- 4. PATTERN OF QUANTITY OF INTAKE**
 - Second helping
 - Filling your plate
 - "Cleaning" your plate
 - Eating all the food you were served
- 5. CONTROL OF INTAKE DUE TO HUNGER**
 - Eating because you feel hungry
 - Eating less or not eating because you feel hungry
- 6. RATE OF INTAKE**
 - Filling your mouth
 - Not chewing each mouthful very much
 - Eating quickly
- 7. REGULARITY OF TIMETABLE AND PLACE OF INTAKE**
 - Watching television while you eat
 - Eating at the same times every day
 - Eating in the same place (e.g., kitchen, dining room)

Note to Table 2. Complete information on the factorial analysis can be found in Sánchez-Carracedo (1994).

eating patterns were extracted: "Externality", "Reduction in intake due to negative emotional states", "Increase in intake due to negative emotional states", "Pattern of quantity of intake", "Rate of intake", "Control of intake due to hunger" and "Regularity of timetable and place of intake". All of the items that constitute the factors are rated on a 7-point frequency scale. The items are listed in Table 2.

Also analysed individually are the items "Nibbling between meals" (whose frequency is rated on a 5-point scale) and "Intake of light (slimmer's) foods and/or drinks" (whose frequency is rated on a 7-point scale). In addition, subjects were asked whether or not they took the following main meals of the day ("Breakfast", "Sandwich at mid-morning", "Lunch", "Afternoon snack" and "Dinner"). These items were isolated as factors in our factorial analysis. A complete description of the questionnaire and its factorial analysis can be found in Sánchez-Carracedo (1994).

Procedure

Once the schools had been selected, in early March 1992, we contacted them, determining the classroom and time for the administration of questionnaires. The research team carried out preliminary training in the procedure to be followed with a group of subjects, which included teachers at the universities involved in the OBA project, research students and undergraduates. The weight and height measures were taken at the same time as the questionnaires were administered, and the instructions were provided both orally and in writing. The sessions in the schools took place between April and May 1992. Due to the proximity of the summer exams, followed by the holidays, the remaining group of schools had their sessions in October and November of the same year. After measurement and the administration of the questionnaires, the data was recorded and refined.

The basic statistical models supporting our data analysis were multiple regression and χ^2 . In the case of the multiple regression analyses, in order to study the specific effects of the different body mass levels on eating patterns, we split the variable "body mass level" into five statistical categories, generating new variables through the so-called "dummy codification", consisting in assigning code 1 to the category whose effect we wish to observed and code 0 to the rest (Arnau, 1990). Dummy codification allows the direct comparison of the effect of each category with a reference category. In our case, we generated four new dummy variables, considering as reference category that of normal weight. These

variables correspond to the comparisons seriously underweight/normal weight, underweight/normal weight, overweight/normal weight and obese/normal weight. Introducing all the variables into the model together allows us to obtain measures similar to those obtained with an analysis of variance, without the need to make *a posteriori* comparisons, since the model gives both a general F of the model and the particular effect of each of the independent variables introduced, included the dummy variables. The entire statistical analysis was carried out using the program SPSS/PC+, Version 4.1.

RESULTS

The distribution of the different groups on the basis of BMI was as follows: 4.9% (n=30) presented a BMI lower than 18kg/m², which we have called *seriously underweight*; 18.3% (n=111) presented a BMI of 18-19.99kg/m², which we have called *underweight*; 61.8% (n=376) presented a BMI of 20-24.99kg/m², which we have called *normal weight*; 13.5% (n=82) presented a BMI of 25-29.99kg/m², which we have called *overweight*; and finally, 1.5% (n=9) presented a BMI of over 30kg/m², which we have called *obese*.

The scores obtained by the different groups in the eating patterns factors rated on the quantitative scales, as well as the total mean ranks and scores of these groups, can be seen in Table 3.

We can observe a tendency to higher *externality* scores, compared to those of the normal weight group, in the groups with lower BMI, and lower *externality* scores in those with higher BMI, although these differences are only significant in the cases of the groups "underweight" and "overweight" (Global F=8.5: df=4.585; p=0.00001 / seriously underweight group t=0.5; df=1.585; p=0.6 / underweight group t=4.1; df=1.585; p=0.00001 / overweight group t=3.1; df=1.585; p=0.002 / obese group t=0.9; df=1.585; p=0.4).

The influence of negative emotional states on the reduction of intake is smaller in the groups with extreme BMIs, though the only comparison whose result is significant is that of the seriously underweight group with the normal weight group (Global F=2.2: df=4.579; p=0.06 / seriously underweight group t=2.02; df=1.579; p=0.04 / underweight group t=0.6; df=1.579; p=0.5 / overweight group t=1.7; df=1.579; p=0.08 / obese group t=0.7; df=1.579; p=0.5).

The influence of negative emotional states on the increase in intake is not significant in any of the groups by comparison with the normal weight group (Global F=0.5; df=4.590; p=0.75).

With regard to *Control of intake due to hunger*, we found significantly better control in the seriously underweight and underweight groups with respect to the normal weight group, while the overweight group presents significantly lower scores (see Table 3). No significant differences are observed with respect to the obese group (Global $F=7.6$; $df=4.583$; $p=0.00001$ / seriously underweight group $t=2.8$; $df=1.583$ $p=0.005$ / underweight group $t=3.3$; $df=1.583$; $p=0.001$ / overweight group $t=2.7$; $df=1.583$; $p=0.008$ / obese group $t=0.6$; $df=1.583$; $p=0.6$).

As far as *Quantity of intake* is concerned, except for slightly lower scores of the overweight group compared to the normal weight group, no significant differences are appreciated between the groups (Global $F=1.3$; $df=4.597$; $p=0.3$).

As for *Intake rate*, scores were found to increase progressively as BMI level increased, though the only significant difference between groups was found for the seriously underweight group, which presented values significantly lower than those of the normal weight group (Global $F=2.1$; $df=4.589$; $p=0.08$ / seriously underweight group $t=2.5$; $df=1.589$ $p=0.01$ / underweight group $t=0.8$; $df=1.589$; $p=0.4$ / overweight group $t=0.2$; $df=1.589$; $p=0.8$ / obese group $t=1.2$; $df=1.589$; $p=0.2$).

As regards *Regularity of timetable and place of intake*, no significant differences are appreciated between the scores of the different groups (Global $F=0.9$; $df=4.596$; $p=0.5$). It is worthy of note that great regularity is observed in all groups, all the scores being close to maximum.

With regard to *Nibbling between meals*, only the overweight group presents significant differences in relation to the normal weight group (Global $F=1.77$; $df=4.601$; $p=0.13$ / overweight group $t=2.4$; $df=1.601$; $p=0.02$), tending to "nibble" less. The obese group actually presents a lower mean than the overweight group, but this difference is not significant by comparison with the normal weight group.

As BMI level increases, so does *Intake of light (slimmer's) foods and/or drinks*, with significant differences being presented in all comparisons with the normal weight group, except, once again, for that of the obese group (Global $F=7.4$; $df=4.601$; $p=0.00001$ / seriously underweight group $t=2.45$; $df=1.601$; $p=0.01$ / underweight group $t=2.02$; $df=1.601$; $p=0.04$ / overweight group $t=3.5$; $df=1.601$; $p=0.0004$ / obese group $t=1.61$; $df=4.601$; $p=0.1$).

Finally, in relation to the study of differences in eating patterns and to the omission or not of the main meals of the day, significant differences between groups were

Table 3
Descriptive statistics of eating patterns factors obtained in the different groups

	Mean	SD	Rank	Min.	Max.	N
EXTERNALITY	27.86	8.82	8-56	8	53	590
seriously underweight	28.41	8.24	8-56	13	44	29
underweight (*)	31.48	8.71	8-56	14	53	108
normal weight	27.60	8.56	8-56	8	51	364
overweight (*)	24.31	8.74	8-56	10	51	80
obese	25.00	9.38	8-56	14	45	9
INTERNALITY-^a	16.43	7.56	5-35	5	35	584
seriously underweight (*)	13.40	6.73	5-35	5	26	30
underweight	16.82	7.41	5-35	5	35	101
normal weight	16.29	7.57	5-35	5	35	366
overweight	17.90	7.56	5-35	5	35	79
obese	14.38	9.55	5-35	5	30	8
INTERNALITY+^b	14.12	6.39	5-35	5	35	595
seriously underweight	14.63	8.22	5-35	5	34	30
underweight	14.49	6.42	5-35	5	35	110
normal weight	14.17	6.28	5-35	5	35	366
overweight	13.32	5.80	5-35	5	34	80
obese	14.78	8.84	5-35	6	32	9
HUNGER^c	11.88	2.48	2-14	2	14	588
seriously underweight (*)	13.07	1.72	2-14	8	14	30
underweight (*)	12.64	1.83	2-14	8	14	107
normal weight	11.76	2.49	2-14	2	14	363
overweight (*)	10.96	2.97	2-14	2	14	80
obese	12.25	2.76	2-14	6	14	8
QUANTITY^d	13.50	4.61	4-28	4	28	602
seriously underweight	13.21	4.96	4-28	4	23	29
underweight	14.04	4.01	4-28	5	24	108
normal weight	13.56	4.78	4-28	4	28	374
overweight	12.55	4.04	4-28	4	28	82
obese	13.33	6.58	4-28	5	25	9
RATE^e	10.23	4.04	3-21	3	21	594
seriously underweight (*)	8.47	3.64	3-21	3	19	30
underweight	10.01	3.69	3-21	3	20	106
normal weight	10.35	4.09	3-21	3	21	368
overweight	10.47	4.34	3-21	3	21	81
obese	12.00	3.50	3-21	3	21	9
REGULARITY^f	12.24	1.54	3-21	3	14	601
seriously underweight	12.53	0.97	3-21	10	14	30
underweight	12.08	1.52	3-21	7	14	108
normal weight	12.27	1.54	3-21	3	14	373
overweight	12.25	1.65	3-21	7	14	81
obese	11.67	2.29	3-21	6	14	9
NIBBLING	2.92	1.11	1-5	1	5	606
seriously underweight	2.80	1.06	1-5	1	5	30
underweight	2.99	1.10	1-5	1	5	110
normal weight	2.97	1.14	1-5	1	5	376
overweight (*)	2.65	1.00	1-5	1	5	82
obese	2.62	1.19	1-5	2	5	8
LIGHT^g	2.03	1.82	1-7	1	7	606
seriously underweight (*)	1.20	0.48	1-7	1	3	30
underweight (*)	1.64	1.49	1-7	1	7	111
normal weight	2.03	1.82	1-7	1	7	375
overweight (*)	2.80	2.16	1-7	1	7	81
obese	3.00	2.45	1-7	1	7	9

Note to Table 3. The differences in "n" are due to the numbers of "missing" subjects. Data referring to the total sample are in bold, and those of the normal weight group, used as a reference for the comparisons, in italics. The groups presenting significant differences with respect to the normal weight group are marked with an asterisk. ^a Reduction of intake due to negative emotional states; ^b Increased intake due to negative emotional states; ^c Control of intake due to hunger; ^d Quantity of intake; ^e Rate of intake; ^f Regularity of timetable and place of intake; ^g Intake of light foods/drinks.

only observed with regard to the omission of the sandwich at mid-morning ($\chi^2=19.6$; $df=4$; $p=0.0006$), and to the omission of the afternoon snack ($\chi^2=16.3$; $df=4$; $p=0.003$). Thus, we find a linear tendency to habitually omit the mid-morning sandwich as BMI level increases (seriously underweight group=10%, underweight group=20.6%, normal weight group=31.7%, overweight group=39% and obese group=66.7%) and a near-linear tendency to habitually omit the afternoon snack as BMI level increases, though a less marked one (seriously underweight group=3.3%, underweight group=20.2%, normal weight group=28.7%, overweight group=37.5% and obese group=33.3%). There are no significant differences between groups in the frequent omission of breakfast ($\chi^2=6.03$; $df=4$; $p=0.19$), despite the fact that 27.6% of seriously underweight subjects frequently omit it, as against 55.6% of obese subjects. Lunch is taken frequently by 100% of subjects of all groups. Nor are differences found with regard to the frequent omission of dinner ($\chi^2=7.38$; $df=4$; $p=0.12$), which is eaten by practically all subjects of all groups.

DISCUSSION

With regard to whether or not the principal meals of the day are taken, overweight and obese subjects only differ from normal weight subjects in that they are more likely to omit the mid-morning sandwich and the afternoon snack, with no differences being found as far as breakfast, lunch and dinner are concerned. It is worth pointing out that, from the point of view of the advocates of a supposed *obese eating style*, obese subjects would more frequently miss out one of the main meals of the day. Schachter (1971) had observed that obese subjects ate fewer meals per day, but with larger helpings. On the other hand, from the point of view of the *theory of restraint*, obese subjects would be more restrained (Herman and Mack, 1975), and more likely to omit a main meal. These studies have usually considered as main meals breakfast, lunch and dinner, since they were mostly carried out with adult subjects. In our case, no differences were observed between groups with regard to any of these meals. In fact, lunch and dinner are taken frequently by practically all subjects, regardless of BMI level, and breakfast is omitted in a similar way by all groups. As far as the mid-morning sandwich and afternoon snack are concerned, given that they are important "gap-fillers" at this age, but not basic to diet as are breakfast, lunch and dinner, their frequent omission by overweight and obese subjects would reflect a restrained behaviour in accordance with their excessive weight,

more than a difference of eating style that consists in more often (than normal weight subjects) resorting to drastic weight reduction measures such as going without meals.

One of the results from our study that most surprised us was that the overweight and obese subjects presented lower *externality* scores than the normal weight subjects, though this difference was only significant in the case of the overweight group. In fact, in other analyses not presented here (Sánchez-Carracedo, 1994), the variable obesity was that which was associated with greater variability of scores in the factor *externality* (more than variables such as gender or concern about diet), but in the opposite direction to that reported in the specialised literature. This appears to be in total contradiction to Schachter's *externality hypothesis* (1968, 1971), or at least to part of it. Schachter suggested initially that external and internal signals could differentially affect the eating behaviour of obese subjects, facilitating it more than interoceptive states such as hunger or satiety (Schachter, 1968). On formalizing the hypothesis in his famous article of 1971, he concluded that as the prominence of a stimulus increases, the reactivity of the obese subject will increase, in contrast to the case of the normal weight subject. Thus, according to Schachter, obese subjects increase intake when the food is tasty and decrease it when it is blander, eat fewer—but larger—meals a day, eat more quickly, consume more when the food is easy to obtain and less when it is difficult to obtain, and present stronger emotional reactions to stress—reactions that are closely related to intake. We say that our data contradicts part of this hypothesis because our *externality* factor assesses basically the sensorial and gustatory attractiveness of food; in this sense the results are contradictory to the ideas of Schachter. We even observed greater *externality* in subjects with low BMI, the difference being significant in the underweight group with respect to the normal weight group. Some studies critical of the ideas of Schachter, such as that of Levitz (1976), had already suggested that the influence of external signs on intake was greater in subjects with normal weight, which is more in accordance with our data. In fact, Schachter's *externality hypothesis* has received a good deal of criticism (Coll, Meyers and Stunkard, 1979; Hill and McCutcheon, 1975; Klesges, Bartsch, Norwood, Kautzman and Haugrud, 1984; Meyers, Stunkard and Coll, 1980; Rodin, 1981; Stunkard and Kaplan, 1977).

It may well be that for overweight subjects in the age group of our study, and in the times we live in, the strong

social pressure to be slim has a more powerful effect than *externality*. In relation to this, the greater restraint observed in obese subjects even in our sample (Sánchez-Carracedo, Saldaña and Domènech, 1996) may influence this lesser *externality*.

We have observed that negative emotional states also have some differential influence, albeit slight, among subjects with different BMI levels. In this case, the reduction of intake due to negative emotional states affects seriously underweight subjects significantly less than it does subjects with normal weight. This is logical if we consider that seriously underweight subjects will feel under certain pressure to follow their normal diet independently of their emotional state. No differences are appreciated between groups with regard to increased intake due to negative emotional states, which was precisely one of the differences most highlighted in the literature.

We can therefore see that internal emotional states appear not to affect the intake of overweight or obese subjects, whilst external signals from food have a negative effect.

Overweight subjects (but not obese subjects) in our sample present significantly poorer control of intake due to hunger than normal weight subjects, while subjects with low BMI (seriously underweight and underweight groups) score significantly higher. This data suggests that subjects with low BMI seem to regulate their intake due to hunger better than normal weight subjects, whilst in overweight subjects hunger would be a poorer regulator of intake. This result is in fact coincident with the basis of Schachter's *externality hypothesis*, in terms of hunger not being the main regulator of intake in overweight subjects. Nevertheless, it would appear to contradict the widespread notion that intake in underweight subjects is affected in an important way by factors of restraint more than by interoceptive signals of hunger and satiety. It also seems to contradict the above-mentioned data suggesting that *externality* affects low-BMI subjects more and overweight subjects less, since greater *externality* should be contradictory to better control of intake due to hunger. How, then, do we explain these results? Rodin (1981) had already underlined the great contradictions found in the literature on this topic, suggesting that there must be more variables, besides *externality*, that would help to explain these contradictions—variables such as age, gender and restraint, and factors of a metabolic, social, etc. nature. In a previous work we presented data on the relationships between some of these variables, such as obesity, gender, special diets and

concern about diet (Sánchez-Carracedo and cols., 1996).

No significant differences were found in any of the groups as far as *quantity of intake* is concerned, though advocates of the *obese eating style* would maintain that overweight subjects consume more. In this respect we should bear in mind that our assessment of eating patterns did not include information on the specific content and/or quantities of subjects' diets. Our self-report questionnaire provides information on eating styles and patterns. Thus, aspects such as taking second helpings or "cleaning one's plate" inform us about eating styles related to the pattern of intake quantity, but do not give us precise information on the quantities ingested. In this context, we would stress the need to complement data such as ours with data on the exact content of diets before drawing firmer conclusions.

Also, we observed a progressive increase in the rate of intake as BMI increases, though the differences are only significant for the seriously underweight group, which presents the lowest rate, and the normal weight group. The obese group presents the highest rate, though the differences are not significant. It was intake rate that was the most studied aspect when it was suggested that there existed an *obese eating style*, after key studies such as that of Ferster, Nurnberger and Levitt (1962), which was one of the starting points for the later *externality hypothesis* of Schachter. Our data is in the same line as many studies that subsequently questioned the existence of such a differential style in obese subjects. What we observed as a new finding was that subjects with very low BMI present significantly lower rates of intake.

There appear to be no substantial differences between the groups as regards *Regularity of timetable and place of intake*, which is high in all cases.

We also observed that the subjects from the overweight and obese groups "nibble" less between meals than normal weight subjects, and consume more "light" (slimmer's) products (though the difference is only significant in the overweight group).

In all, this data contradicts once again the existence of a supposed *obese eating style*, and reinforces the idea that the obese boys and girls of our sample present a series of more restrained eating patterns than normal weight and even low-BMI subjects. Thus, they more frequently omit the mid-morning sandwich and afternoon snack, restrain their intake more in the presence of external signals inciting them to eat, "nibble" less between meals and consume greater quantities of light or slimmer's foods/drinks. All of these behaviours would appear to reflect an attitude of control of intake in accordan-

ce with their excessive weight, more than an over-restrained approach. Supporting this suggestion is the finding, reported elsewhere, that obese subjects are more likely to follow special diets (Sánchez-Carracedo, and cols., 1996).

It is interesting to note that the subjects with different levels of excess weight (overweight group and obese group) present either very similar scores or scores that follow a linear tendency. The only important difference found concerned the pattern of *reduction of intake due to negative emotional states*, for which the overweight group presented higher scores than the normal weight group, whilst the obese group presented lower scores, though in no case did these differences attain significance. It may be that the small number of obese subjects led to some distortion of data.

We believe that consideration of different BMI groups in the study of eating patterns, as against the classic dichotomous obese/normal weight comparison, may help to provide new data. In this sense, we feel it was useful to have included in the comparisons subjects with low BMI, such as those of the seriously underweight group and underweight groups. These groups obtained some scores that differed from those of the normal weight group, and always in the opposite direction to that in which the overweight and obese groups differed. Thus, they were more likely to regularly take a mid-morning sandwich and afternoon snack, and presented greater *externality* (significant in the underweight group), lower *reduction of intake due to negative emotional states* (significant in the seriously underweight group), better control of intake due to hunger (significant in both groups), a lower rate of intake (significant in the seriously underweight group), and a lower intake of light/slimmer's products (significant in both groups). In general, this data appears to suggest behaviour that is not particularly restrained, a feature even more marked in the seriously underweight group, where once again it would seem to be behaviour in accordance with their weight deficit, in the same way that the restraint observed in the overweight and obese groups is in accordance with their excessive weight.

In conclusion, the existence of the supposed *obese eating style* does not appear to be confirmed by the data obtained in our sample. We observed somewhat restrained behaviour in overweight subjects, but which appeared to be in accordance with their weight problem, and behaviour that was not particularly restrained in underweight subjects –also concordant with their condition–,

all of which is at odds with the usual findings of studies with northern European and U.S. samples.

Our results suggest that the eating patterns of the subjects in our sample are substantially different from those observed in samples from other developed countries, both in Europe and elsewhere. These differences are probably due to the influence of culture and lifestyle on a population's acquisition of eating habits¹. It is for this reason that we feel it important to carry out studies on these topics with local samples. There is a clear predominance of studies carried out with English-speaking samples, and we should be extremely cautious about extrapolating the applicability of their data to populations with a different eating culture, such as the Spanish one.

Finally, we should warn the reader once more of the risk of drawing conclusions on the basis of self-report data. This issue is particularly pertinent here, since wide variations can be found in the literature on this topic when laboratory procedures or natural observation were employed, with only a few instances of the use of self-report. It should also be pointed out, however, that the topic has rarely been studied with samples of the age group we used, and even less with samples from this country. We should also stress the enormous practical difficulties involved in assessing the eating behaviour of samples as large as ours through more direct procedures. Even so, we feel it important to encourage studies that would include other measures, such as self-recording, which would allow us to study not only eating patterns, but also the content of diets. Among other advantages, this would provide a way of checking whether the Mediterranean diet, much-praised for its healthy characteristics (high intake of pulses, fruit, vegetables and fresh fish, extensive use of olive oil, etc.) continues to constitute the basic fare of young people in Spain.

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NOTE

¹ It should be pointed out that the timetable for meals in Spain differs considerably from that of, say, Britain. Thus, breakfast is taken between 7.30 a.m. and 9 a.m., lunch between 2 p.m. and 3 p.m., and dinner/supper between 9 p.m. and 10 p.m. With such long spaces between meals, the mid-morning sandwich and afternoon snack take on more importance here than that of a typical snack in many other eating cultures.

REFERENCES

- Arnau, J. (1990). *Diseños experimentales multivariados (Multivariable experimental designs)*. Madrid: Alianza Editorial.
- Brownell, K.D. and Wadden, T.A. (1991). The heterogeneity of obesity: fitting treatments to individuals. *Behavior Therapy*, 22, 153-177.
- Coll, M., Meyers A. and Stunkard, A.J. (1979). Obesity and food choices in public places. *Archives of General Psychiatry*, 36, 795-797.
- Dodd, D.K., Birky, H.J. and Stalling, R.B. (1976). Eating behavior of obese and normal weight females in a natural setting. *Addictive Behaviors*, 1, 321-325.
- Drabman, R.S. and Cordua, G. (1981). Eating styles: a developmental overview. In J.M. Ferguson and C.B. Taylor (Eds). *The Comprehensive Handbook of Behavioral Medicine: Vol II. Syndromes and Special Areas* (pp. 95-102). Lancaster: MTP Press Limited.
- Ferster, C.B., Nurnberger, J.I. and Levitt, E.E. (1962). The control of eating. *Journal of Mathematics*, 1, 87- 109.
- Garner, D.M. and Wooley, S.C. (1991). Confronting the failure of behavioral and dietary treatments for obesity. *Clinical Psychology Review*, 11, 729-780.
- Herman, C.P. and Mack, D. (1975). Restrained and unrestrained eating. *Journal of Personality*, 43, 647- 660.
- Hill, S.W. and McCutcheon, N.B. (1975). Eating responses of obese and nonobese humans during dinner meals. *Psychosomatic Medicine*, 37(5), 395-401.
- Klesges, R.C., Bartsch, D., Norwood, J.D., Kautzman, D. and Haugrud, S. (1984). The effects of selected social and environmental variables on the eating behavior of adults in the natural environment. *International Journal of Eating Disorders*, 3(4), 35-41
- Levitz, L.S. (1976). The susceptibility of human feeding behavior of external controls. In G. Bray (Ed.). *Obesity in Perspective* (pp. 53-60). Publication No (NIH) 75-708. Dept. of Health, Education, and Welfare.
- Marston, A.R., London, P. and Cooper, L.M. (1976). A note on the eating behavior of children varying in weight. *Journal of Children Psychology and Psychiatry*, 17, 221-224.
- Meyers, A.W., Stunkard, A.J. and Coll, M. (1980). Food accessibility and food choice: a test of Schachter's externality hypothesis. *Archives of General Psychiatry*, 37, 1133-1135.
- Price, J.M. and Grinker, J. (1973). Effects of degree of obesity, food deprivation, and palatability on eating behavior of humans. *Journal of Comparative and Physiological Psychology*, 85(2), 265-271.
- Rodin, J. (1981). Current status of the internal-external hypothesis for obesity. What went wrong? *American Psychologist*, 36(4), 361-372.
- Rothblum, E.D. (1990). Women and weight: fad and fiction. *Journal of Psychology*, 124, 5-24.
- Sánchez-Carracedo, D. (1994). Hábitos alimentarios y restricción en jóvenes adolescentes con obesidad y peso normal (Eating habits and restraint in obese and normal weight adolescents) (Microform). (Doctoral theses on microfiche / Universidad de Barcelona; 2444). Barcelona: Publicaciones Universidad de Barcelona.
- Sánchez-Carracedo, D., Saldaña, C. and Domènech, J.M. (1996). Obesity, diet and restrained eating in a Mediterranean population. *International Journal of Obesity*, 20, 943-950.
- Saldaña, C. (1994). Evaluación de trastornos del comportamiento alimentario (Assessment of eating behaviour disorders). In R.F. Ballesteros (Ed.), *Evaluación Conductual Hoy. Un Enfoque para el Cambio en Psicología Clínica y de la Salud*, Madrid: Pirámide.
- Schachter, S. (1968). Obesity and eating: internal and external cues differentially affect the eating behavior of obese and normal subjects. *Science*, 161, 751-756.
- Schachter, S. (1971). Some extraordinary facts about obese humans and rats. *American Psychologist*, 26, 129-144.
- Schachter, S., Goldman, R. and Gordon, A. (1968). Effects of fear, food deprivation, and obesity on eating. *Journal of Personality and Social Psychology*, 10(2), 91-97.
- Straw, M.K. and Rogers, T. (1985). Obesity assessment. In W.W. Tryon (Ed.), *Behavioral Assessment in Behavioral Medicine* (pp. 19-65). New York: Springer.
- Stuart, R.B. (1967). Behavioral control of overeating. *Behaviour, Research and Therapy*, 5, 357-365.
- Stunkard, A.J. and Kaplan, D: (1977). Eating in public places: a review of reports of the direct observation of eating behavior. *International Journal of Obesity*, 1, 89-101.
- Stunkard, A.J. (1984). The current status of treatment for obesity in adults. In A.J. Stunkard and E. Stellar, *Eating and its disorders* (pp. 157-183). New York: Raven Press.
- Wooley, S.C., Wooley, O.W. and Dyrenforth, S.R. (1979). Theoretical, practical, and social issues in behavioral treatments of obesity. *Journal of Applied Behavior Analysis*, 12, 3-25.