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Measuring brand awareness as a component of eating habits in children: the development of the IBAI (International Brand Awareness Instrument) Italian version

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TITOLO
Misurare la conoscenza dei marchi come una componente delle abitudini alimentari dei bambini: lo sviluppo dell'IBAI (International Brand Awareness Instrument) versione italiana

KEY WORDS
Brand awareness, food logos, children nutrition

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Summary
The aim of the present work was to develop an instrument that allows to estimate the Italian children's brand awareness. We developed the IBAI (International Brand Awareness Instrument), an age-appropriate instrument that uses thirty sheets with pictures of food logos to test children's recall and recognition, and the IBAI-r, a reduced and less time-consuming form of the IBAI (with 12 sheets).The IBAI was presented (Study 1) to a sample of 145 children aged from 6 to 11 years, and after one month the IBAI-r was presented (Study 2) to the same sample. Both instruments allowed to distinguish different kinds of children's brand awareness and when compared, they resulted to be very consistent.

Riassunto
Lo scopo di questo studio è di sviluppare uno strumento che permetta di stimare la riconoscibilità dei marchi nei bambini italiani. Per testare la memoria e la conoscenza dei bambini, abbiamo creato l'IBAI (International Brand Awareness Instrument), uno strumento composto da trenta schede con immagini di loghi di prodotti alimentari, e l'IBAI-r, una forma ridotta dell'IBAI, composta da 12 schede. L'IBAI è stato presentato ad un campione di 145 bambini, di età compresa tra i 6 e gli 11 anni (studio 1), e dopo un mese, allo stesso campione di bambini, è stato proposto l'IBAI-r (studio2). Entrambi gli strumenti hanno permesso di distinguere livelli di conoscenza dei marchi diversi tra i vari bambini e quando comparate, le differenze risultano essere molto consistenti.

Introduction

While multiple biological factors may mediate individual susceptibility to obesity (1), several researchers agree that environmental changes have facilitated the rapid increase of the syndrome in recent years. A primary environmental factor associated with childhood obesity is increased television (TV) viewing (2, 3). Excess TV viewing increases the amount of sedentary time and might displace

time available for physical activity. Additionally, TV viewing is often accompanied by food consumption (4), particularly of energy dense snack foods (5, 6) and part of this effect has been attributed to a disruption in food cue habits that occurs when one is viewing a TV program (7). Most often foods advertised during children's and family programs are cereals, snacks, and fast foods (9), many of which are high in sugar, fat, and calories. Finally, it is claimed that food advertisements might directly affect intake by either stimulating hunger and/or encouraging children to consume the specific foods that are marketed (8).

Branding is, in fact, a form of marketing aimed at promoting recognition with a company brand or product, in the hopes that children will form emotional attachments to these products and eventually be lifelong consumers (9). Different studies suggest that food marketing alters children's preference for specific food brands (8, 10, 11). It seems that advertisements act as cue for food consumption: exposure to them may thus promote eating in individuals who are responsive to these message or images. For example, recently the powerful effects of food branding were seen in a study by Robinson et al., where children had higher preferences for foods in McDonald's© wrappers, regardless of whether the foods contained in the packaging came from McDonald's© or not (11).

Very few instruments are however available for assessing brand knowledge and awareness in children, in particular for the age class 6-11, which corresponds to the elementary school level. Forman, Halford, Summe, MacDougall, & Keller (12) proposed a new brand awareness instrument which is basically a logo-matching exercise, consisting of 30 pictures that were representative of food brand logos. Obviously, considering that some food brand logos are very common (i.e., McDonald's©) while others differ in each country, this brand awareness instrument is particularly linked to the American countries.

There were two main aims for the present study. First, in the Study 1 we developed an instrument to assess the children's brand recognition and recall suitable for the Italian culture, the IBAI (International Brand Awareness Instrument). Second, in the Study 2 we developed a reduced form of the IBAI (IBAI-r; International Brand Awareness Instrument-reduced form). When we started to propose this instrument to the children in the Study 1, we noted that in the middle of the testing session some children were very bored, in particular if they were not able to recognize the brand. For that reason and considering that a less time-consuming instrument for the brand awareness evaluation might be appreciated by both the participants and the experimenters who sometimes have to present different kind of tests or questionnaires to the participants, we developed a reduce form of the IBAI (IBAI-r) that allows to test the children's brand awareness in a short time. Finally, a comparison between the two instruments was performed to assess the reliability of the IBAI reduced form.

Material and methods

Stimuli selection

We generated a pool of 30 candidate items of brands for the IBAI full version. In line with the study of Forman et al. (12), we developed the IBAI paying attention in particular to the food brand selection. Three product categories were selected as stimuli: sweet snack, salted snack, soft drinks. In table 1, the complete list of brands is presented. These foods were selected based on discussions between the investigators working on this project (in particular, between psychologists and pedagogues). We used two criteria in selecting the brands. First, the brands had to be available in the majority of the Italian supermarkets. Second,

Table 1 - International Brand Awareness Instrument (IBAI)

Flash Card	Brand	Solution	Product 1	Product 2	Product 3	Product 4
1 **	Coca Cola ©	A	Coca Cola	milk	orange	chocolate
2 **	Mc Donald ©	C	pasta	toast	hamburger	fish
3 **	Pavesi ©	D	brioches	pudding	creme caramel	Pan Gocciole
4	Milka ©	A	chocolate bar	creme caramel	chocolate pudding	chocolate ice cream
5	Kinder © (jam)	B	bread with jam	Kinder Brioss	Flauti with jam	krapfen
6 **	Mulino bianco© (jam)	C	bread with jam	Kinder Brioss	Flauti with jam	krapfen
7	Kinder © (chocolate)	C	chocolate bar	Pan di stelle	Délice	chocolate pudding
8	Mulino bianco© (chocolate)	B	chocolate bar	Pan di stelle	Délice	chocolate pudding
9 **	Cameo ©	B	chocolate bar	mou mou pudding	yogurt	ice cream
10 **	Pringles ©	A	Pringles potatoes	normal potatoes	peanuts	gummy candies
11	Kellogs ©	B	peanuts	chocolate bar Special K	normal potatoes	Pringles potatoes
12	Kraft ©	A	Spuntì	bread with jam	normal potatoes	peanuts
13 **	Algida ©	C	creme caramel	yogurt	Cuore di panna	gummy candies
14	Galbani ©	A	Galbanino cheese	pasta	triangular cheese	yogurt
15	Haribo ©	A	gummy candies	wrapped candies	lollipop	sugared almonds
16	Nestlè ©- Cherioos	B	Cereal	Cheerios	creme caramel	yogurt
17 **	Danone ©	A	pudding (Danette)	Cornetto-ice cream	chocolate bar	Smarties
18	Nestlè ©	A	Smarties	biscuits	cereals	gummy candies
19 **	Yoga ©	C	Coca Cola	milk	fruit juice (in a glass)	chocolate
20	Fattoria Scaldasole ©	B	ice cream	yogurt	creme caramel	pudding
21	Susanna ©	A	sliced cheese	tunna	normal potatoes	Pasta
22	Kellog's ©- Corn Flakes	B	peanuts	Corn Flakes-cereals	normal potatoes	Pringles potatoes
23 **	Nestlè ©	D	chocolate bar	biscuits	Lions	gummy candies
24	Loacker ©	D	chocolate bar	biscuits	Wafers loacker	pudding
25	Ringo ©	A	Ringo	brioches	chocolate bar	Gocciole
26	Pai ©	C	peanuts	Cereal	normal potatoes	Gocciole
27	San Carlo ©	B	Gocciole	Wacko's potatoes	peanuts	gummy candies
28 **	Kellog's©-Frosties	D	normal potatoes	Cheerios	Wafers	Frosties (cereals)
29 **	Fonzies ©	C	sliced cheese	normal potatoes	Fonzies potatoes	cereals
30	Kellog's ©-CocoPops	D	Cheerios	cereals	Frosties	Cocopos

List of brands and products presented in the flash cards of the IBAI with the solutions of the correct brand and product associations. The 12 marked Flash Cards (**) was included in the list of brands and products of the IBAI-r version

Table 2 - Item response distribution for the IBAI

Flash card	Brand name		Brand-product association		Product name	
	n	%	n	%	n	%
1	107	73,8	108	74,5	95	65,5
2	130	89,7	134	92,4	69	47,6
3	20	13,8	42	29,0	16	11,0
4	101	69,7	136	93,8	115	79,3
5	117	80,7	101	69,7	10	6,9
6	124	85,5	109	75,2	61	42,1
7	112	77,2	73	50,3	18	12,4
8	129	89,0	94	64,8	53	36,6
9	91	62,8	136	93,8	107	73,8
10	72	49,7	107	73,8	108	74,5
11	63	43,4	122	84,1	84	57,9
12	2	1,4	36	24,8	5	3,4
13	59	40,7	125	86,2	107	73,8
14	3	2,1	40	27,6	17	11,7
15	34	23,4	70	48,3	66	45,5
16	15	10,3	92	63,4	68	46,9
17	20	13,8	73	50,3	45	31,0
18	6	4,1	17	11,7	19	13,1
19	2	1,4	24	16,6	11	7,6
20	1	0,7	43	29,7	29	20,0
21	28	19,3	117	80,7	79	54,5
22	20	13,8	94	64,8	51	35,2
23	5	3,4	24	16,6	9	6,2
24	38	26,2	73	50,3	66	45,5
25	131	90,3	136	93,8	132	91,0
26	14	9,7	21	14,5	26	17,9
27	66	45,5	70	48,3	100	69,0
28	9	6,2	94	64,8	71	49,0
29	62	42,8	111	76,6	86	59,3
30	60	41,4	125	86,2	94	64,8

the brands had to belong to food for children.

As regards the IBAI-r version (Study 2), we selected from the IBAI 12 candidate items of brands. Three product categories was selected as stimuli: sweet snack, salad snack, drinks. In table 2, the complete list of brands is presented (showing also the corresponding number of the flash cards of the IBAI).

Instrument development

An age-appropriate instrument that used pictures of food logos to test children's recall and recognition was developed. Each of the 30 logos of the selected brands were paired with 4 pictures of foods, and only one of them was correctly matched with the logo. Thirty sheets for the IBAI[1], called flash cards, with one logo and four choices of foods (of which one was paired with the logo on the top of the sheet) were created (see Table 1 for the selected flash cards used in the IBAI and IBAI-r). An example of one of these sheets can be found in Figure 1.

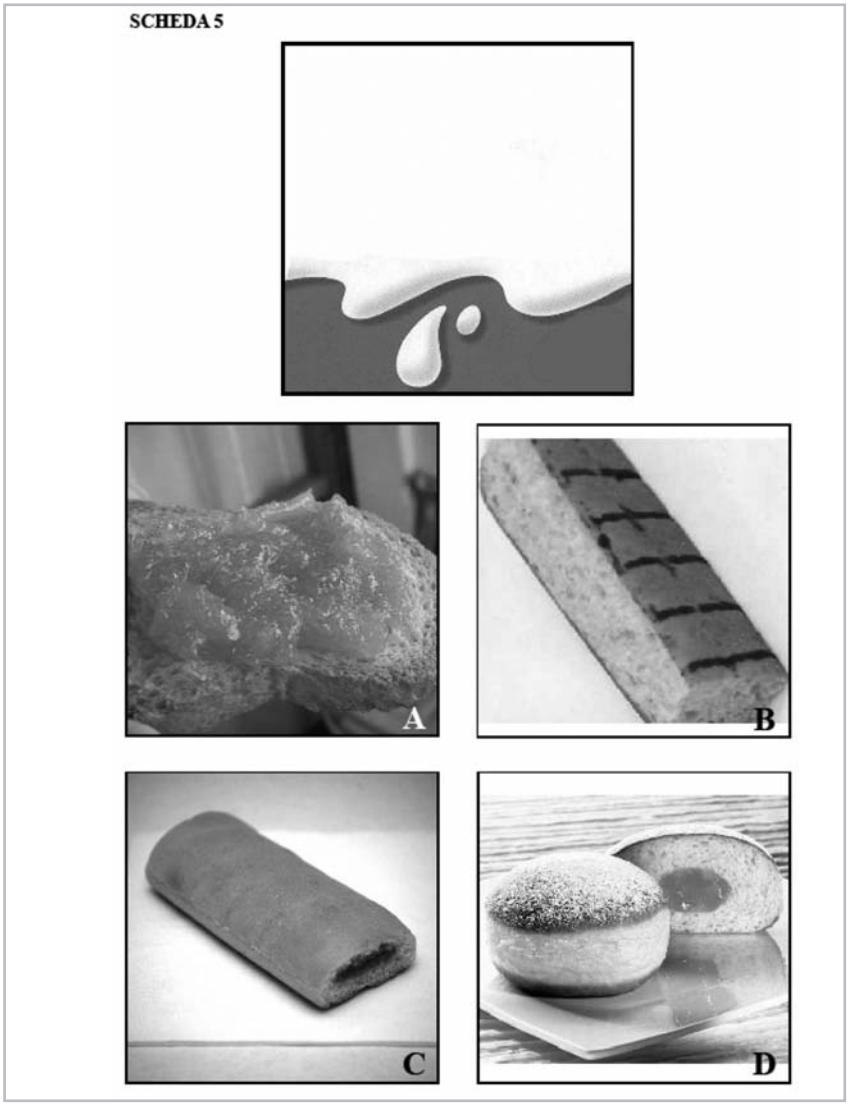
All pictures [a total of 30 brand logos, and 90 foods (3 per brand logo)] were laminated in 8 × 11.5 sheets and placed in a 3-ring binder for ease of presentation (see (12).

Study sample

A total of 145 children, 69 girls and 76 boys, aged from 6 to 11 years (Mean = 8.35 years old, SD = 1.62) participated in the study for the development of the full version of the IBAI, and after one

[1] The IBAI and IBAI-r instruments are free of charge for academics and no-profit organizations. For commercial studies, the instruments are with fee and are downloadable at the webpage: http://Food.zetaresearch.eu

Figure 1 - An example of flash card used in the IBAI. The Kinder's brand logo of a Kinder Brioss (II position from upper left) was associated with a traditional bread & marmelade, a product from another brand and a traditional cake, producing a single card with five images.



month the same sample was recruited for the Study 2 (IBAI-r). None of them had any known developmental delays, based on parent report. Parent informed consent was obtained for all children prior to each child's participation in both studies.

Study conduction

The procedure followed in the two studies was the same. The instruments (IBAI; IBAI-r) were proposed to Italian children with a recognition and a recall task. In particular, the recall task was focused on the brand naming, in line with the procedure described by Forman et al. (12), and on the product naming. We included also this last task, because sometimes the brand and product naming are different from the name of the food (i.e., brand: McDonald's©; product: Big Mac; food: hamburger). Including the product naming task, we assume that this instrument might offer a more reliable measure of the children's food brand awareness.

Children were presented with each flash cards of the IBAI (or IBAI-r), individually. For each flash card children were asked three questions in order to verify her/his knowledge about the brands and about the products associated with the selected brands. Pointing at the image of the logo, the experimenter asked "Do you know the name of this logo?" Once children answered, doing a circle with the forefinger over the four products, the experimenter said "choose the food that matches with the logo" Finally, when the child selected a food picture, the experimenter asked "Which is the

name of this product?". The experimenter did not say to the children if the responses were right or not (to not influence the children's performances in the Study 2).
Each card was scored by the experimenter with 1 point if the child correctly named the logo brand, 1 point if the child chose the correct food that matched with the logo, and 1 point if the child correctly named the product. With a total of 30 flash cards, scores on the brand awareness procedure ranged from 0 to 90 (3 points X 30 flash cards). Using this range, it is possible to create four different conventional categories of children's brand awareness: 0-30 very low brand awareness; 31-45 medium-low brand awareness; 46-60 medium-high brand awareness; 61-90 very high brand awareness. The same categories can be used also for the IBA-r, referring the scores (from 0 to 36; 3 points *x* 12 flash cards) to the IBAI range, that is 0-90.

Results

Study 1: IBAI (International Brand Awareness Instrument)

The item response distribution (for the correct definition of the brand name, the correct association brand and product, and the correct definition of the product) for the IBAI is presented in table 2. Considering the total score reached by each child, the majority of the children for both gender showed a medium brand awareness (43.4% a medium-low; 29.7% a medium-high) (Tab. 3).
In order to analyze the differences in the three tasks of the IBAI (the brand naming, the brand - product association, and the product naming), statistical analysis was performed with Student's t test for paired data. Statistical significance levels used a criterion of $p < .05$. Comparing the number of the correct responses in the thirty items, the brand - product association task presented significantly more correct responses than the brand naming task ($t = -4.94$, $df = 29$, $p < .001$) and the product naming task ($t = 5.76$, $df = 29$, $p < .001$) (Fig. 2).

Study 2: IBAI-r (International Brand Awareness Instrument-reduced form)

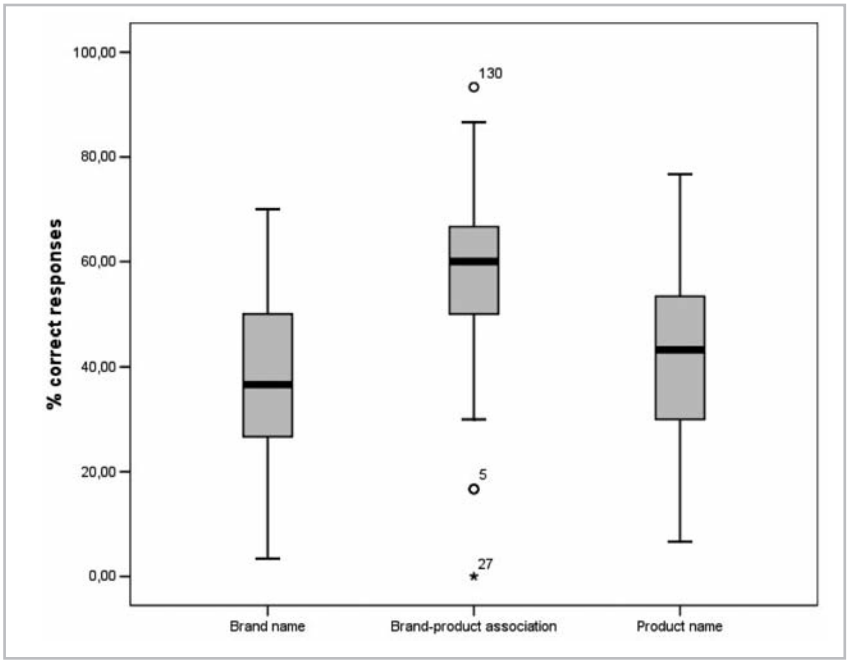
The item response distribution (for the correct definition of the brand name, the correct association brand and product, and the correct definition of the product) for the IBAI-r was very similar to the distribution resulted for the IBAI. Considering the total score reached by each child, the majority of the children for both gender showed a medium brand awareness (35%) (Tab. 4).
In order to analyze the differences in the three tasks of the IBAI-r (the brand naming, the brand -

Table 3 - Children's total IBAI score

		Gender								Total sample	
		Female				Male					
		6-8 ys.		9-11 ys.		6-8 ys.		9-11 ys.			
		n	%	n	%	n	%	n	%	n	%
Score	0-30	7	19.4	8	24.2	9	20.9	6	18.8	30	20.7
	31-45	18	50.0	13	39.4	16	37.2	16	48.5	63	43.4
	46-60	9	25.0	9	27.3	14	32.6	11	33.3	43	29.7
	61-90	2	5.6	3	9.1	4	9.3	0	-	9	6.2
Total		36	100	33	100	43	100	33	100	145	100

The scores were stratified by gender and by age

Figure 2 - The number of correct responses for the three tasks of the IBAI



product association, and the product naming), statistical analysis was performed with Student's t test for paired data. Statistical significance levels used a criterion of p <.05. Comparing the number of the correct responses in the twelve items, the brand - product association task (M = 90.58, sd = 40.46) presented significantly more correct responses than the brand naming task (M = 58.42, sd = 47.17) (t = -3.85, df = 11, p = .003) and the product naming task (M = 65.42, sd = 37.70) (t = 5.05, df = 11, p <.001).

Finally, in order to compare the two instruments (IBAI vs IBAI-r), assessing how well the two raters agree, the Bland-Altman method was used. Results were considered significant at a value of p <.05. The Bland-Altman plot in figure 3 shows the agreement between the two instruments for the total score (3a), and separately for the three tasks: the brand naming (3b), the brand - product association (3c), and the product naming (3d).

Discussion

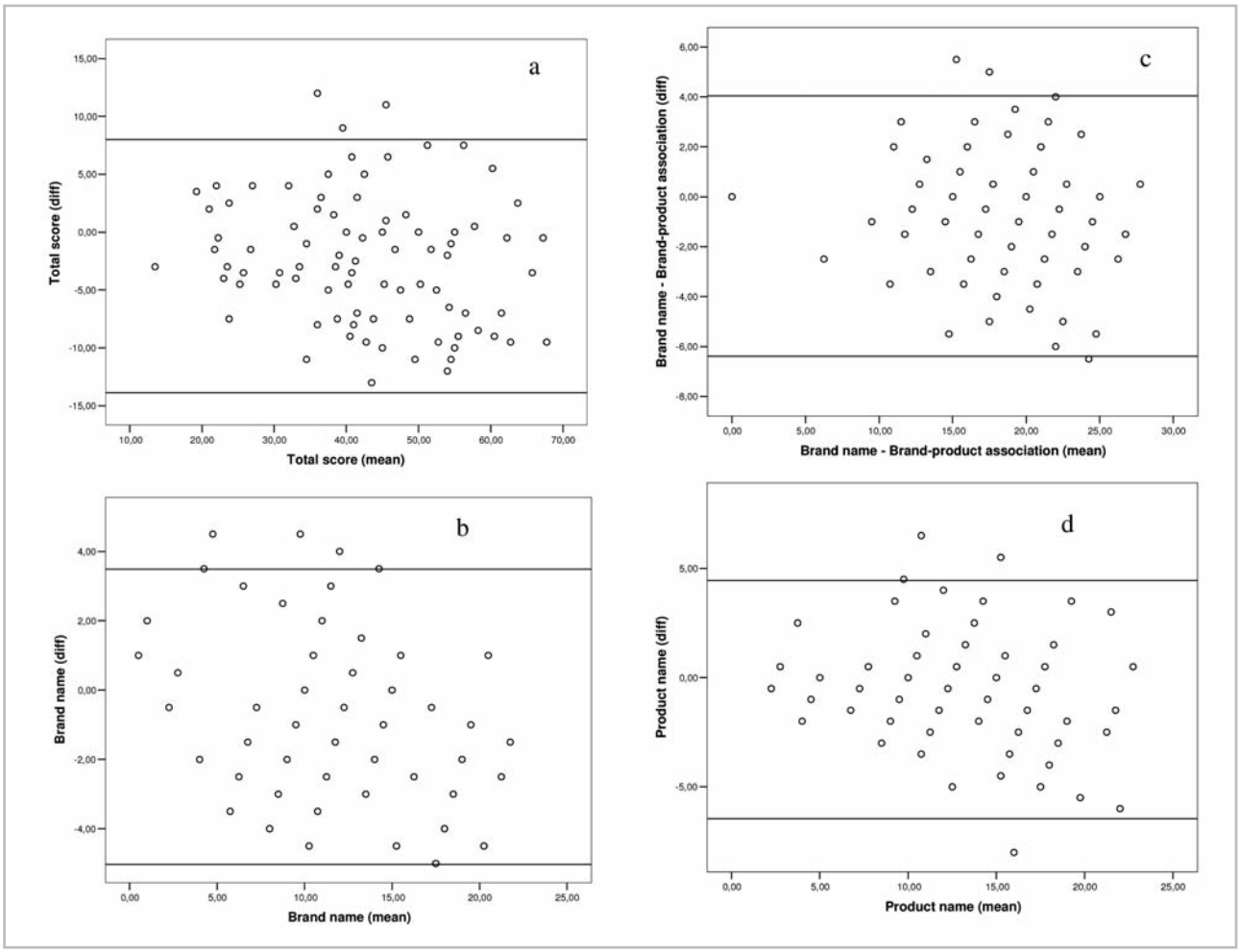
Both studies that the IBAI forms are interesting instruments for the Italian children's brand awareness evaluation. Considering that the children scores for the IBAI and

Table 4 - Children's total IBAI-r score

		Gender								Total sample	
		Female				Male					
		6-8 ys.		9-11 ys.		6-8 ys.		9-11 ys.			
		n	%	n	%	n	%	n	%	n	%
Score	0-30	8	22.2	7	21.2	6	14.0	6	18.2	27	18.6
	31-45	11	30.6	11	33.3	15	34.9	14	42.4	51	35.2
	46-60	14	38.9	11	33.3	14	39.5	10	30.3	52	35.9
	61-90	3	8.3	4	12.1	5	11.6	3	9.1	15	10.3
Total		36	100	33	100	43	100	33	100	145	100

The scores were stratified by gender and by age

Figure 3 - The Bland-Altman plots for the IBAI and IBAI-r total score (a), and for the brand naming (b), brand - product association (c), and product naming (d) tasks



the IBAI-r ranged in all the four created categories, we can assume that these instruments allow distinguishing different kinds of children's brand awareness. In addition, they allow to test children's recall and recognition with different tasks. In particular, the statistical analyses showed for both versions, that the brand - product association task is easier than the recall tasks (i.e. brand or product naming). This result is in line with Forman et al. (12), the authors found that the recall exercise was too difficult for some children aged between 4 and 6 years, suggesting that the children age is an important factor in determining their ability to perform in the recall task. Even if the children of the present work were older that those recruited by Forman et al. (12), it is possible that some difficulties in the recalling brand or product names in 6 and 11-year-olds are still present.

The aim of this work was to develop an instrument that allows to estimate the Italian children's brand awareness. Following the methodology utilized by Forman et al. (12) for the development of a similar instrument utilized with American children, we developed the IBAI, specific for the Italian culture. Considering that the IBAI could be applied in different experimental settings, matched with other tests, and noting the weariness or a bored state of some children after the first half of the test, we developed a reduce form of the instrument, the IBAI-r, derived from the full version of the IBAI. Both these instruments have showed to be able to assess the children's brand awareness and when compared, they resulted to be very consistent.

These instruments might result very interesting in the analysis of the influence of food marketing on children's diet, considering the rapidly increasing rate of overweight children. The food promotion by the industry has a detrimental impact on children's food preferences, eating behaviors and the purchase requests they make to their parents.

Further studies to clarify the relationship between the children's advert-exposure (television viewing time) and, consequently, the brand awareness, and their weight status and their food habits are necessary. Developing instruments, such as the IBAI, specific for each country, is very important in order to study the environmental changes that have facilitated the rapid increase in childhood obesity, and the implication for the marketing of unhealthy foods to children.

References

1. Hill JO. Understanding and addressing the epidemic of obesity: an energy balance perspective. Endocrine Reviews 2006; 27: 750-61.
2. Campbell KJ, Crawford DA, Ball K. Family food environment and dietary behaviors likely to promote fatness in 5-6 year-old children. International Journal of Obesity 2006; 30: 1272-80.
3. Cooper TV, Klesges LM, Debon M, Klesges RC, Shelton ML. An assessment of obese and non obese girls' metabolic rate during television viewing, reading, and resting. Eating Behaviors, 2006; 7: 105-14.
4. Matheson DM, Killen JD, Wang Y, Varady A, Robinson TN. Children's food consumption during television viewing. American Journal of Clinical Nutrition 2004; 79: 1088-1094.
5. Coon KA, Goldberg J, Rogers BL, Tucker KL. Relationships between use of television during meals and children's food consumption patterns. Pediatrics 2001; 107(E7).
6. Halford JC, Gillespie J, Brown V, Pontin EE, Dovey TM. Effect of television advertisements for foods on food consumption in children. Appetite 2004; 42: 221-5.
7. Temple JL, Chappel A, Shalik J, Volcy S, Epstein LH. Daily consumption of individual snack foods decreases their reinforcing value. Eating Behaviors 2007; 9: 267-76.
8. Borzekowski DLG, Robinson RN. The 30-second effect: an experiment revealing the impact of television commercials on food preferences of preschoolers. Journal of the American Dietetic Association 2001; 101 (1): 42-6.
9. Connor SM. Food-related advertising on preschool television: building brand recognition in young viewers. Pediatrics 2006; 118: 1478-85.
10. Brody GH, Stoneman Z, Lane TS, Sanders AK. Television food commercials aimed at children, family grocery shopping, and mother-child interactions. Family Relations 1981; 30: 435-9.
11. Robinson TN, Borzekowski DL, Matheson DM, Kraemer HC. Effects of fast food branding on young children's taste preferences. Archives of Pediatrics & Adolescent Medicine 2007; 161: 792-7.
12. Forman J, Halford JC, Summe H, MacDougall M, Keller K. Food branding influences ad libitum intake differently in children dependingon weight status. Results of a pilot study. Appetite 2009; 53: 76-83.