

## Article

# Cartoon Characters in Children's Series: Gender Disparities in Body Weight and Food Consumption

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**Abstract:** (1) *Background:* Media play a significant role in forming audience perceptions about physical external appearance and food consumption patterns. It has been reported that children's cartoons project slimness, and concomitantly consumption of poor nutritional quality food. However, data on the role of gender in this respect are lacking; thus, this was the aim of the present study. (2) *Methods:* 100 episodes of the 10 most popular cartoon series were analyzed. Characters' body weight status was classified into underweight, normal weight and overweight, and foods consumed as core (e.g., fruit, vegetables) and non-core (e.g., sweets, snacks). Messages about characters' attractiveness were recorded and classified according to their body weight status and gender. (3) *Results:* Out of 37 protagonists, 12 were female figures (32%), while out of the 10 thin protagonists, 7 were females (70%) and only 3 males (30%). Thin heroines were the recipients of the majority of the messages connotative to physical attractiveness (36 out of 58 messages). However, consumption of core and non-core foods did not differ within genders (core:  $z = -1.526$ ,  $p = 0.127$ , non-core:  $z = -0.417$ ,  $p = 0.667$ ). (4) *Conclusions:* Females seem to be underrepresented in cartoon series but receive the majority of the comments related to physical appearance, with most of them addressing the attractiveness of a thin figure.



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**Keywords:** cartoon; gender; body weight; food consumption; television; attractiveness

## 1. Introduction

Television is a pervasive purveyor of culture, providing a wide array of stereotypes and messages about eating that influence children's food preferences [1,2], while media mainly advertise processed foods [3,4]. Likewise, television programs and series addressed to children seem to convey stereotypical messages about food. Existing research indicates that snacks and sweets dominate in animated cartoons [5–7]. We have previously reported that in popular comic series, convenience foods (sweets, snacks and soft drinks) were seen to be consumed in more episodes than any other food category [8]. Following the NOVA food classification system, where foods were classified as minimally processed, processed and ultra-processed, Horta et al. [9] found that were equally represented in 13 top box office children's movies; however, sweets were more linked to a positive context, while fruits, vegetables and fast foods to negative or neutral ones. Similarly, an analysis of 250 children's movies demonstrated that unhealthy foods and beverages were more likely to be presented centrally, to be evaluated positively and finally to be consumed more in children's movies [10]. In 20 children's movies, scenes depicting unhealthy food items outnumbered those depicting healthy items [11], while Eisenberg et al. [12] found that cartoon comic series present scenes with unhealthy snacks along with excessive consumption more frequently than other TV shows such as sitcoms or dramas.

While there is a repetitive projection of unhealthy processed foods in children's cartoons, at the same time, they seem to depict systematically body stereotypes idealizing thinness. Researchers investigating characters' body image and external appearance in

children's programming have consistently reported that their slim or normal body is portrayed as beautiful and desirable. Examining gender differences in regard to cartoon characters' body shape or physical appearance, Baker and Raney [13] reported that among 60 cartoon characters, muscular or athletic bodies belonged only to male characters, while female characters were usually beautiful and of average weight. Stereotypes of sexuality, such as thinness, were found to differ by gender, with female characters often appearing thinner than male ones [14], while Klein and Shiffman [15] found that females were four times more likely than male characters to be shown as underweight. A content analysis of 134 teens' episodes found that ideals of beauty were related to slim, white female protagonists while, by contrast, non-ideal female body shapes were projected as the "bad" and mean characters in the plot [16]. Moreover, in Disney popular tween programming, female characters were more likely to be concerned with their physical appearance while men with sports and athletics, thus reinforcing the ideals of female attractiveness and male muscularity [17]. Research presented above examined depiction and messages of various food items in children's cartoons without examining the way in which they relate to the characters' gender and body weight. For example, Klein and Shiffman [15] showed that overweight characters were more likely to be eating "junk" food, while Herbozo [18] indicated that obese heroes were seen thinking about food or placed in a setting related to food in 52% of the movies examined; however, these studies did not take under consideration any differences in food consumption between male and female heroes. We have also previously shown that compared to their fellow actors, overweight characters consumed more food and chose to eat processed (non-core) foods more often, but no gender discrimination was examined in that study [19].

To the best of our knowledge, so far, there has been no research focusing on food eaten by cartoon characters according to their gender and body weight, nor the messages expressed about their physical appearance. The aim of this study was, therefore, to explore whether food consumption by characters in animated series differs between male and female characters; furthermore, the study aimed at assessing gender-related disparities in characters' body weight status and food choice patterns. In addition, gender and body weight disparities were also sought among the messages projected about the characters' attractiveness. The primary hypothesis was that thin female characters would be over-represented in children's comic series, while the secondary hypothesis was that female characters would also receive more positive comments on their external appearance.

## 2. Methods

### 2.1. Study Material

The methods used herein have been analytically described elsewhere [19]. In brief, animated cartoon series from Greek television stations aimed at children from 4 to 14 years old were selected based on their audience rates. Viewing information reflecting broadcasting rating was provided upon request of the researchers by Nielsen Audience Company. Audience rates were based on the average minute rating scale (AMR). AMR is defined as the percentage of the number of people who are watching a program on the average minute of a given period (a percentage over the total population of the target group). The top 10 of these, i.e., those with an AMR of 9.5% or above, comprised the material of the study: Ben 10, Dora the Explorer, Jewelpet, Lazy Town, Penguins of Madagascar, PitchiePitchie Pitch, SpongeBob SquarePants, Teen Days, Tom and Jerry and Tutenstein, from which 10 episodes were randomly selected, leading to a total of 100 episodes finally analyzed. Two raters of a nutrition background coded the episodes, after being trained through a pilot viewing of some episodes so as to get familiar with the sceptic and the basic ideas of the survey. Results focus on the main cartoon characters, otherwise mentioned as protagonists or heroes hereafter.

## 2.2. Coding

### 2.2.1. Assessment of Food Consumption by Cartoon Characters

The classification of food items shown in the episodes in core and non-core was based on the Australian guide for healthy eating [20]. This classification of foods has been adopted by other research [21–23] which analyzed children's intake of non-core foods, as it was considered a more meaningful way of approaching and describing the eating habits of cartoon characters in children's series. The category "core foods" includes five basic food groups: bread and cereals, meat, dairy, fruits and vegetables, while the category "non-core" or "discretionary foods" includes foods that should be consumed less often and in small quantities, such as sweets, salty snacks, sweetened beverages, fast food, processed meat and margarine, since they are of rather poor nutritional value, usually being energy-dense and high in saturated fats, salt and sugar. In our study, one portion of each food consumed was defined based on the frequency this food item was shown to be eaten. Once the characters appeared to eat a food (either eating the whole portion or just a bite of it), then one food portion was registered as consumed. From now on, the consumed portions of food shall be referred to as "food". In cases where, in a scene, a hero eats a food and the scene changes, and then it goes backwards to the same character still consuming the same food, one portion was noted down as consumed.

### 2.2.2. Definition of Body Weight Status and Gender

In the present study, characters' body weight status was classified in the following categories: underweight, normal weight and overweight. The raters were guided to record as "underweight" heroes apparently tall, well-shaped and thin, with narrow body parts like the belly, the waist, the hips and arms, generally parts which did not stand out from the body outline. By contrast, raters were instructed to record as "overweight" characters obviously large, with big bellies, buttocks, arms, swollen cheeks, all of these features extending over the body shape, essentially including both overweight and obese characters, as distinction among them was difficult. Lastly, those heroes who did not belong to any of the above categories were defined as being of normal weight. For example, the character Skipper in Penguins of Madagascar was classified as overweight, appearing larger than his mates, or Mr. Krab in SpongeBob SquarePants as overweight, and SpongeBob as normal weight. Characters' gender classification proved to be a straightforward process for the raters. In cases of non-human characters, where the gender discrimination was not obvious, we ascertained the character's gender based on their female or male name, on the mild (feminine) or heavy (masculine) tone of their voice and other external features of their appearance; for example, men's/women's clothes or hair styles. Researchers reported the degree of agreement (interrater reliability) among the raters using the k-coefficient which was at least 0.90 for all the major variables presented (0.963 for core foods, 0.967 for non-core food consumption, 0.907 for body size, etc.). Disagreements among raters seldom occurred and were resolved after mutual discussion and consent.

### 2.2.3. Messages Projected about Attractiveness

The study also examined the messages relevant to the attractiveness of the cartoon protagonists, either coming from themselves or from the fellow actors. Thus, a qualitative analysis was followed so that all messages expressed by the heroes were recorded and registered. Any comments expressed by fellow actors concerning the characters' appearance, i.e., thin, normal or overweight body, were also noted down and counted. These messages concern any comments, oral and visual, of the protagonists about their own body or their fellow actors' one. That is, for example, the enthusiasm depicted on a character's face while watching their thin fellow actor intruding onto the stage was registered as a positive message about attractiveness, whereas an overweight character's disappointment while trying to put on a pair of jeans which does not fit them was recorded as a negative message about attractiveness. Positive messages on attractiveness contained a character's

exclamation such as “Look at her! How beautiful and thin she is!”, while a negative message on attractiveness was “Oh my God, look at me what a disaster!”.

### 2.3. Statistical Analysis

Descriptive statistics included the frequency distribution of cartoon characters’ gender, species, body weight and of core and non-core food portions consumed (in all episodes evaluated). Descriptive analysis was also conducted for the positive and negative messages on attractiveness within gender and body weight. The statistical software package Stata version 14 (MP & Associates, Sparta, Greece) was used for all statistical analyses. Statistical significance was defined as  $p < 0.05$ . Normality tests were performed (Kolmogorov–Smirnov), and for nonparametric variables, Wilcoxon tests were adjusted. Wilcoxon nonparametric tests were performed to compare the median portions of core and non-core foods eaten within the two genders: one test between gender and core food consumption and one test between gender and non-core food consumption. Wilcoxon tests were also performed between two categories of body weight status (overweight versus others) within gender so as to compare core and non-core food consumption. Statistical significance for all tests was defined for  $p$  values below 0.05.

### 3. Results

The total number of different heroes appearing in the 100 episodes was 37:25 males (68%) and 12 females (32%). Of these, 23 were human figures while 14 were non-human (various animals, a flying teddy bear, a mummy and a sponge). In relation to their body weight status, 21 (57%) heroes were classified as of normal weight, 10 (27%) as thin and 6 (16%) as overweight. Of the 10 thin protagonists, 7 were female figures, while among the 6 overweight heroes, only 1 was female, specifically a young girl. In total, 58 positive messages on attractiveness were recorded, 36 of which were addressed to female protagonists and 22 to males. All 36 positive messages recorded for females referred to thin characters, while 15 out of the 22 positive messages addressed to males referred to thin ones (Table 1). Only one positive message was recorded for overweight characters, this being a male character. In regard to negative messages on attractiveness, 20 messages were recorded in total, of which 8 referred to overweight characters. Table 1 summarizes the results on positive and negative messages regarding attractiveness, according to heroes’ gender and body weight status.

**Table 1.** Number of positive and negative messages connotative to attractiveness according to the characters’ gender and body weight status.

Body Weight Status	Males			Females		
	<i>n</i> (%) of Characters	Positive Messages	Negative Messages	<i>n</i> (%) of Characters	Positive Messages	Negative Messages
Thin	3 (12%)	15 (68%)	1 (8%)	7 (58%)	36 (100%)	4 (57%)
Normal	17 (68%)	6 (27%)	7 (54%)	4 (33%)	0	0
Overweight/Obese	5 (20%)	1 (5%)	5 (38%)	7 (58%)	0	3 (43%)
Sum	25 (100%)	22 (100%)	13 (100%)	12 (100%)	36 (100%)	7 (100%)

The characters’ distribution in the sample and the number of messages are classified by gender. Results are presented in cardinal numbers and as percentages in parentheses.

Regarding food consumption, in total, 179 foods were shown to be eaten in all episodes, with twice as many non-core foods compared to core foods (120 vs. 59). For males, the median core food consumption was 1.0 (0.0; 3.0), while for females 0.0 (0.0; 1.0). For males, the median non-core food consumption was 2.0 (0.0; 4.0), while for females 1.5 (0.0; 3.0). The hypothesis that the median food consumption of core and non-core did not differ within genders could not be rejected according to Wilcoxon tests (core:  $z = -1.52$ ,  $p = 0.12$ ),

(non-core:  $z = -0.41$ ,  $p = 0.66$ ). Therefore, there was no difference found in consumption of core and non-core foods between genders.

Table 2 presents the median portions of core and non-core foods consumed according to characters gender and body weight status (thin, normal and overweight) in all 100 episodes evaluated. Both male and female overweight characters had a high non-core median food consumption. On the other hand, both female and male thin characters had a low median consumption of core and non-core foods.

**Table 2.** Median portions of core and non-core foods eaten according to characters' gender and body weight.

Body Weight Status	Males		Females	
	Core	Non-Core	Core	Non-Core
Thin	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 2.0)
Normal	1.0 (0.0, 3.0)	2.0 (0.0, 2.5)	1.5 (0.25, 3.5)	2.5 (0.5, 4.5)
Overweight/Obese	3.0 (1.5, 4.5)	7.0 (0.5, 24.5)	1.0 (1.0, 1.0)	12.0 (12.0, 12.0)

Continuous variables not normally distributed are presented as median (q1; q3).

The hypothesis that the median food consumption of non-core food for male characters did not differ within body weight ( $p = 0.148$ ) could not be rejected; the same occurred for female characters ( $p = 0.167$ ). It appears that there was no significant difference in consumption of non-core foods and body weight status for male or female characters.

#### 4. Discussion

The present study examined the messages on attractiveness and foods shown to be eaten between female and male cartoon characters, as well as according to their body weight status, in the top 10 series addressed to children and adolescents on Greek TV. Messages on attractiveness addressed to male and female characters were evaluated as either positive or negative and then classified according to characters' body weight status and characters' gender. Findings indicated that a character's slim body was usually associated with positive comments. Even though women were underrepresented in the animated cartoon sample (12 characters out of 37), 70% of the thin characters were females. Interestingly, we found that all of the positive messages (36 out of 36) about the outward appearance of the female characters referred specifically to the slim ones. We should underline the fact that the three slim male characters also received a remarkable number of positive comments (15 out of 22 registered). Likewise, this finding asserts the idealization of the male slim body as handsome and desirable. In reference to negative messages, it is worth mentioning that 40% of those concerned overweight characters (8 out of 20), while only one (1.7%) positive message (out of 58 in total) concerned an overweight male hero. The results of our analysis agree with other studies which found children's cartoons depicting the slim/thin or normal body as beautiful and attractive [15,16,18,24], while in our previous analysis [19], it was also indicated that characters' slim bodies were usually associated with positive comments on attractiveness; in particular, most of them (88%) were recorded for slim and attractive protagonists. Similarly to our findings, Northup and Lieber found that the beauty ideal was mostly associated with the slim heroines, while Baker and Raney [13] reported that most female animated characters were portrayed as more attractive compared to males. A recent study found that children assigned fewer positive characteristics (i.e., nice, good look, smart, hard work) to the overweight figures than the thin ones regardless of gender and stimulus type (i.e., drawings and photographs of human figures—boys and girls—or images of alien cartoons). Although, once the stimulus type was examined by gender, thin girls always rated higher than overweight girls, the same applied to thin and overweight boys [25]. Additionally, a research focusing on 239 females' body shape (and not on body weight or size) in cartoon series found that over the last 20 years, there has been a shift from the dominant "hourglass" shape to the dominance of other body shapes ("pear",

“rectangle”) which have small waists and so may be called thin by the researchers analyzing body size [26].

The present study does not investigate the potential impact that the projection of idealized slim bodies of cartoon heroes may have on the way young audiences perceive their personal shape. However, in the real world, media seem to play a significant role in forming audience perceptions about physical external appearance and body image. Children start shaping perceptions about their appearance from a very early age, while even kids seem to have a total view about their body image [27]. Mainly female adolescents develop a negative body image and dissatisfaction after their repeated exposure to depictions of slim idealized bodies in animated cartoons or other media products. Anschutz et al. [28] found that girls with higher levels of thin ideal internalization showed higher body satisfaction after exposure to thin ideal characters than after exposure to animated or real characters featuring no thin ideal features. Those findings might suggest that young girls who internalized the thin ideal are inspired by these slim characters in children’s media. Finally, another study mentions that Disney princes (male) tend to portray the muscular ideal, which is associated with poor body esteem in boys and men [29]. By contrast, there is some evidence finding no impact of idealized media representations on youngsters’ body image. Although Coyne et al. [30] found that girls were much more likely than boys to engage with Disney princesses through viewing media, there were no gender differences on body esteem (i.e., body image). As researchers point out, this surprising finding occurs because most children have positive body esteem at this age (participants were five years old). Girls and female adolescents are more concerned with their body weight and physical appearance; in particular, young girls are more likely to express dislike for their body [31–33], something which increases when they pass from preadolescence to adolescence [34], while boys report that they are more interested in acquiring a well-shaped body [35]. Girls tend to copy female stereotypes from television, movies and magazines and are very likely to be on a constant diet in future [36], while most of them agreed that mass media greatly influence their desire to be slim, a finding which was more pronounced among elderly girls [37]. Furthermore, in relation to dieting behaviors, a survey found 45% of females and 17% of males reporting persistent use of unhealthful weight control behaviors [38]. Unlike girls, who get into the diet world and its nutritional restrictions very early, boys report that are being urged by their parents to eat up their food [38], notwithstanding the findings of one study that younger boys are not immune to weight and body image concerns [39].

No differences were found in consumption of core and non-core foods between the two genders or within each body weight status category. Although we found that overall, non-core foods were eaten more (120 vs. 59), the limited sample of the characters’ body weight distribution in some cases (i.e., five overweight males, one female overweight or three thin males) did not allow any differences to be noted during the statistical tests carried out. Contrariwise, there is some research showing differences in both the quantity and the quality of foods consumed according to characters’ body weight status without focusing on gender disparities. In particular, in our previous study [19], significant differences were found in core and non-core food consumption ( $p = 0.047$ ,  $p = 0.001$ , accordingly) within the three body weight categories; in other words, 7% of all food items were eaten by underweight characters as opposed to 48% by overweight and 45% by normal weight characters. Moreover, Klein and Shiffman [15] reported that underweight characters were more likely to be seen eating than slim or normal weight co-actors; however, overweight characters were the ones that were more likely to eat “junk” food.

Our findings showing no differences in non-core food consumption between male and female cartoon characters may reflect children’s nutritional habits in the real world where boys and girls eat energy-dense foods in a similar manner [40]. Research on the quality of children’s diet indicates that over the past few decades, fast food consumption and snacking have greatly increased [41,42]. Interestingly, Braithwaite et al. [43] found that one quarter of children and half of all adolescents worldwide consume fast food frequently

or very frequently, while reported fast-food consumption seems to increase in adolescence. With regard to gender discriminations, compared to boys, girls were more likely to follow healthier eating habits [34,44]. One other study found that consumption of snacks by adolescents was positively related to a diet of high sugar and fat content (sugar sweetened beverage, desserts, cereals) for males and to sugar and fat content (butter, margarine, whole fat dairy products) for females [45]. Finally, a study that examined snacking habits during TV viewing found that for both genders, salty snacks were the most popular snacks, but girls selected fruits and vegetables more frequently than boys. As for drinks, boys preferred sugar-sweetened beverages more often than girls, who chose juice more often than boys [46].

Previous research has explored either cartoon characters' body weight status or their food consumption. However, research is scarce concerning the role of gender in this respect. To our knowledge, this is the first study analyzing cartoon heroes and heroines in relation to their body weight and food consumption. Despite this strong point, though, the current analysis has some limitations. One of them is the relatively small sample of the characters studied; future studies should examine a larger number of animated cartoons. Arguably, the fact that 10 episodes were selected randomly from each series is also a limitation, considering that other episodes might contain different references and skew the results to a certain degree. A further consideration that the series in the study were broadcasted during 2011–2012, and the content of animated series currently shown on TV might have changed in the interim. Lastly, a more detailed classification of the foods would probably better depict the food choices of cartoon heroes according to their body weight and gender.

The present analysis of gender disparities in animated characters' body weight revealed that females, although half in number compared to males, were usually depicted as thin compared to males, who were usually of a normal body weight. Furthermore, thin heroines exclusively received positive messages referring to female characters' attractiveness. In the modern world, a variety of media influences shape children's food choices and their perception on physical appearance. In cartoons, the depictions of idealized slim bodies usually surrounded by positive comments on attractiveness may affect young girls' and boys' perception about the ideal physical appearance of somebody who is attractive and desirable. In addition, unhealthy food consumption by popular characters could possibly form children's future food choices. It has been shown that children, in response to exposure to advertised high-sugar foods, consume a significantly greater amount of those compared with advertisements containing no food mentions [47,48]. While regulations for advertisements targeting children are already in force, regulations on the content of children's programming particularly in animated cartoon series have not yet been applied. Moreover, there is some evidence showing that cartoon characters can be used to promote healthier food [49,50]. Since the wellbeing of the children is of great priority, appropriate policies should be implemented for healthier food references and body stereotypes in children's media.

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