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## The transgenerational transmission of physical attractiveness perceptions: Role of parents' physical activity and nutrition habits in modelling body-focused health attitudes and body shape perception in five-year-old offspring

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## Abstract

**Introduction:** Observing parents' body-focused behaviours during middle childhood is one of the initial ways in which children model their perceptions of pro-health attitudes and their connection to physical attractiveness. This study aimed to investigate the relationship between parents' health behaviours, their appearance, and the perceptions of adult body types (skinny, medium, obese) by their five-year-old children. Moreover, the role of gender in the above relationship for both children and parents was also examined. **Materials and methods:** This study participants were 680 families with five-year-old children (330 girls). Participation was limited to the moth-er-father-child triad. The Beauty and Health Scale, Healthy Behaviour Inventory, Inventory of Physical Activity Objectives, and a body composition analyser were used to measure body fat percentage. **Results:** Assessment of pictures of male silhouettes by five-year-old girls revealed the perception that men who exercise do not lose weight but maintain a healthy, attractive appearance. However, they believed that women should actively lose weight to achieve an attractive figure. Interestingly, women were more likely to be perceived as overweight, despite engaging in physical activity. **Conclusions:** This study underscores the importance of integrating health education and physical activity interventions into family-oriented disease prevention programmes aimed at cultivating positive health behaviours in children as well as parents.

## Keywords

physical activity in family, health habits and physical activity, body image and child's perception, body image in family system, physical activity and body perception

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Article

# The transgenerational transmission of physical attractiveness perceptions: Role of parents' physical activity and nutrition habits in modelling body-focused health attitudes and body shape perception in five-year-old offspring

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**Abstract:** Introduction: Observing parents' body-focused behaviours during middle childhood is one of the initial ways in which children model their perceptions of pro-health attitudes and their connection to physical attractiveness. This study aimed to investigate the relationship between parents' health behaviours, their appearance, and the perceptions of adult body types (skinny, medium, obese) by their five-year-old children. Moreover, the role of gender in the above relationship for both children and parents was also examined. Materials and methods: This study participants were 680 families with five-year-old children (330 girls). Participation was limited to the mother-father-child triad. The Beauty and Health Scale, Healthy Behaviour Inventory, Inventory of Physical Activity Objectives, and a body composition analyser were used to measure body fat percentage. Results: Assessment of pictures of male silhouettes by five-year-old girls revealed the perception that men who exercise do not lose weight but maintain a healthy, attractive appearance. However, they believed that women should actively lose weight to achieve an attractive figure. Interestingly, women were more likely to be perceived as overweight, despite engaging in physical activity. Conclusions: This study underscores the importance of integrating health education and physical activity interventions into family-oriented disease prevention programmes aimed at cultivating positive health behaviours in children as well as parents.

**Keywords:** physical activity in family, health habits and physical activity, body image and child's perception, body image in family system, physical activity and body perception.

## 1. Introduction

In children, "Body Self" is the first component of the 'self' that develops over the course of ontogenesis [1]. One's relationship with their body begins to be defined in early childhood, initially as an outcome of parental influences. Nearly till the end of preschool, children have very little direct influence on parental body-related health behaviours. These are adults who are responsible for the nutrition and physical fitness of their off-

spring [2, 3]. Parents shape how their children perceive physical attractiveness, both indirectly and directly, and also teach about its importance in social life [4]. Moreover, mothers and fathers are the first determinants of the canons of beauty [5], as they directly express their approval or disapproval regarding the appearance of other people, media celebrities, and even their own children.

### *1.1. Eating habits and body image*

Children's perception of what constitutes beauty is shaped not only by parents' physical appearance and parents' opinions on beauty ideals but also by their body care behaviours. Parents clearly socialise their children, establishing norms about eating, weight, shape, and response to stress, and controlling the food environment in the home [6]. Mothers of post-infantile and preschool children show particular body weight concerns [7]. Children inadvertently observe their mothers' efforts to improve their own appearance either through health-promoting practices, such as balanced diets or physical activity, or through restrictive slimming practices, use of weight loss agents, and obsessive weight-watching [8]. Moreover, children often hear conversations among adults about physical attractiveness, its role in social life, and how to achieve it. Furthermore, they frequently witness their mothers complaining about their own appearance, especially body weight [9, 10]. Adolescent daughters often face a combination of critical remarks about their bodies and encouragement for weight loss and dieting from parents, and mothers' modelling of extreme crash dieting is associated with parallel behaviours in daughters [11]. Parents use more targeted modelling with same-sex children [7, 12]. Parents observe the eating behaviour of their offspring, highlighting differences in how mothers and fathers implement nutritional parenting practices and/or differences in how these practices affect their children [13, 14]. In addition, healthy weight management and nutrition education are important elements that contribute to the correct perception of body shape [15]. Emotional states influence perceptions of eating, especially in girls. High body dissatisfaction leads to vulnerability to emotional attitudes towards food [16]. Parental messages related to the body, including those encouraging weight change and healthy eating, contribute to children's body dissatisfaction. A family culture focusing on appearance has a greater impact on daughters than on sons, potentially leading to unhealthy attitudes towards food and inappropriate attitudes towards one's own appearance. In daughters, poor body image increases the risk of developing eating disorders [17].

### *1.2. Physical activity and body image*

Regular physical activity (PA) and having a balanced nutritious diet are the most common health-promoting behaviours [18]. Both PA and diet directly impact the condition and health of the body, and indirectly impact mental health and general well-being [19]. Physical activity and diet are the main route to achieving an attractive physique [20, 21]. Interestingly, the intensity of involvement in PA itself boosts satisfaction with one's appearance, regardless of objective parameters such as body mass index (BMI) or waist-to-height ratio (WtHR) [22, 23]. The important moderating role of gender in this area is again emphasised. The unquestionable influence of sport activity on body shape, mostly through increasing muscle mass, is also congruent with the standards of appearance for men, but not women [24–26]. Women generally state that the goal of PA is to obtain or maintain a skinny figure and prevent obesity [27]. Moreover, sport is a perfect example of an area with very strong stereotypes—it is usually described as 'masculine' [28, 29]. In most cultures, boys engage in more sporty play activities than girls [30, 31]. They are also more motivated to practice sports [32] and partake in physical education classes [33]. The gender of both parents and children also plays an important role in the process of inter-generational transmission of beauty ideas connected with PA.

### *1.3. The role of gender in body perception*

There are hardly any psychological processes that are more gendered than body image. Men and women differ in both content and degree of body dissatisfaction and body change behaviours. Currently, gender differences are clear and feasible: females focus on weight and body shape, while males are interested in muscular tone [34, 35]. However, the most important difference lies in the subjective significance of physical attractiveness as perceived by women and men [36]. Physical attractiveness is considered a crucial element of femininity, but not of masculinity [37]. Both women and men hold a 'single' ideal of feminine beauty (interpreted as 'the only way' to evaluate the attractiveness of the female body shape), while what represents an attractive body shape in males is not so clearly defined. Although the model of beauty is stable over time, a man can be 'attractive in a different way' [38]. This proves the prescriptive notion of standards for female beauty. The level of muscularity is associated with the efficiency and strength of the body and, therefore, is desirable; however, it is not connected with excessive value when assessing the image of a male body [36].

Women's increased attention on their bodies as objects of beauty is likely to be a key factor in explaining their more negative body esteem as compared to men [36]. Differences in attitudes toward their own bodies, observed among girls and boys, are particularly evident during adolescence, when body dissatisfaction increases among girls and decreases in boys [39]. Girls and young women most often report dissatisfaction with their body shape and insufficiently feminine appearance [40]. This can be linked to the biological changes that girls undergo during adolescence as well as the prevalence of unrealistic beauty standards that dictate what a desirable adult female body should look like [9, 41]. This weight gain puts girls at odds with Western culture's standard for female appearance, an extremely thin and pre-pubertal body shape, which is unhealthy and unattainable for most post-pubertal girls [42]. Gender differences emerge in childhood and seem to persist throughout most of life [43].

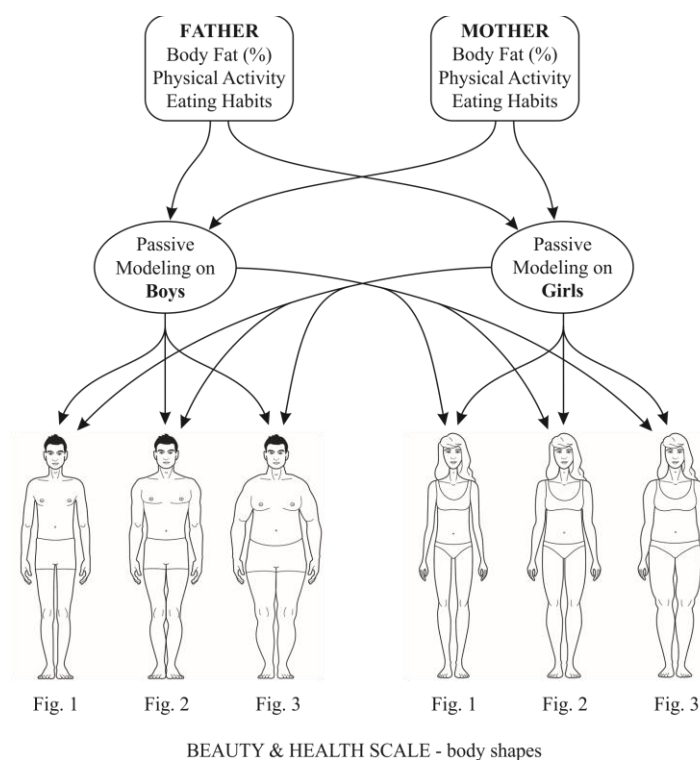
### *1.4. The present study*

In this study, we examine the relationship between two variables. The independent variable is the parents' health behaviour (diet and PA) and their appearance, in terms of the fat level (body fat percentage). The dependent variable is children's attribution of health behaviours to the silhouettes presented in the drawings.

We formulated two research questions:

- 1) Is there a relationship between parents' health behaviours and appearance (passive modelling) and children's perception of adults' silhouettes?
- 2) Does the gender of both children and parents play a significant role in this relationship?

We developed a theoretical research model that describes the parent-child relationship, indicating selected assumptions of the relationship between the variables (Figure 1).



**Figure 1.** Theoretical model of the assumed dependencies in the parent-child relationship

## 2. Materials and methods

### 2.1. Participants

A total of 416 families with five-year-old children (190 girls and 226 boys;  $M = 5.70$ ,  $SD = 0.32$ , girls  $M = 6.2$ , boys  $M = 5.2$ , girls  $SD = 0.34$ , boys  $SD = 0.32$ ) participated in this study. Only mother-father-child triads were invited so as to enable analysis of the relationship between the passive modelling of parental health behaviour and its perception by the offspring. We chose five years as the age because children's motor skills grow significantly at that stage of development [44]. In addition, starting school in the 'zero' class is associated with the first, partially independent decision to engage in health-promoting or health-endangering behaviour. Age five is the ideal time to explore how health behaviours can passively model the child's perception of their parents' body shapes. To control the influence of family factors and the socioeconomic status (SES), several variables were collected: the parents' age ( $M_{\text{male}} = 34.00$ ,  $SD_{\text{male}} = 5.24$ ,  $M_{\text{female}} = 37.00$ ,  $SD_{\text{female}} = 6.00$ ), the area of residence (26.50% lived in villages, 9.75% in small towns, 23.25% in mid-size cities, 40.50% in large cities), and the number of children in the family (21% one-child families).

### 2.2. Procedure

Data were collected from participants selected from kindergartens and primary schools in the Pomeranian Region in Poland. Children were assessed individually in educational centres; the data used in this study was part of a larger project, and the detailed enrolment procedure was described elsewhere. Prior to the study, written informed consent was obtained from all parents/guardians who were also assured that they may discontinue their children's participation at any time without consequences. The study procedure was performed in accordance with the World Medical Association's Code of Ethics (Declaration of Helsinki) for human experiments using data collection. The protocol of this study was approved by the Ethics Board for Research Projects at the Institute of Psychology, University of Gdansk, Poland (decision no. 17/2013). The preparation of this article was supported by the National Science Centre (grant number 2015/17/B/HS6/04144; head: Malgorzata Lipowska).



### 2.3. Methods

Different types of information were collected using the Beauty & Health Scale (BHS), the Inventory of Physical Activity Objectives (IPAO), Inventory of Healthy Behaviours (HBI), and the Body Composition Analyser. The data used for this study was part of a larger survey, and the study questionnaires took around 20 minutes to complete.

The Beauty and Health Scale (B&HS) [45] – in this scale, children were asked to match features related to pro-health or anti-health behaviours and social status to pictures of female and male silhouettes with distinctly different body weights. This scale is designed for children aged 5–9 and includes 18 items. Some of them are supported with illustrations presenting various behaviours. The child is asked to match each activity to one of three pictures presenting adults with different body shapes (skinny, normal, and obese). The questionnaire has two variants, for girls and boys, referring to women and men, respectively. In this study, we only used two subscales – pro-health behaviours and anti-health behaviours. Cronbach's  $\alpha$  for individual subscales had satisfactory values between 0.86 and 0.89 [45].

The Inventory of Physical Activity Objectives (IPAO) by Lipowski and Zaleski [46] was used to collect detailed interviews regarding the parents' athletic past and their current engagement in various forms of PA. The questionnaire contains questions regarding whether one has done sport in the past and what discipline they practiced, for how long, and at what level. Analysis of the number of hours per month currently devoted to certain types of PA (e.g., gym, swimming, running, team sports, martial arts) is an important part of the questionnaire; additionally, respondents indicate whether they engage in these activities regularly or sporadically. The questionnaire also allows the analysis of the goals with which respondents undertake PA; however, this aspect was not used in the current study. Data on the total number of hours spent on maternal and parental PA during the month were analysed. The Cronbach's reliability coefficient for IPAO reached 0.79.

The Healthy Behaviour Inventory (HBI) [47] evaluates involvement in health-seeking practices. It presents 24 Likert-scaled statements describing various types of health-seeking behaviours divided into four subscales: proper nutrition habits, prophylactic behaviour, health practices, and positive psychological attitudes. The respondents reveal how frequently they engage in the described behaviour using a 5-point scale (1 – almost never, 2 – rarely, 3 – from time to time, 4 – often, and 5 – almost always). In this study, we only used the proper nutrition habits subscale. Internal consistency was assessed using Cronbach's  $\alpha$ , which was equal to 0.85 for the entire inventory and 0.60 for the proper nutrition habits.

The Body Composition Analyser (Segmental Body Composition Monitor–Tanita BC-601) helps assess the body-fat status of children and parents. For the statistical analysis, the parameter of maternal and paternal fat as body fat percentage (%BF) were taken into account.

## 3. Results

### 3.1. Descriptive statistics of the study group

In the first stage of statistical analysis of the obtained research results (using the STATISTICA 13.3 program), in accordance with the research questions, descriptive statistics were used in the following ways.

- 1) Description of socio-demographic indicators that are significantly related to the characteristics of the study group (age, gender, mother's and father's education) were obtained (Table 1).
- 2) Descriptive statistics were calculated for the variables used in the research model. For this purpose, various values, such as the average and median values, were measured for the following variable indicators: PA of the mother and father and body fat percentages of the mother and father (Table 2).

- 3) The percentage distribution of variables was made: the level of PA of the mother and father and the level of body fat percentage of the mother and father compared to the norms.
- 4) In the subsequent stages of statistical analysis, the r-Pearson coefficient and the chi-square test were used.

**Table 1.** Parents' characteristics categorisation including level of education, body fat percentage, and physical activity

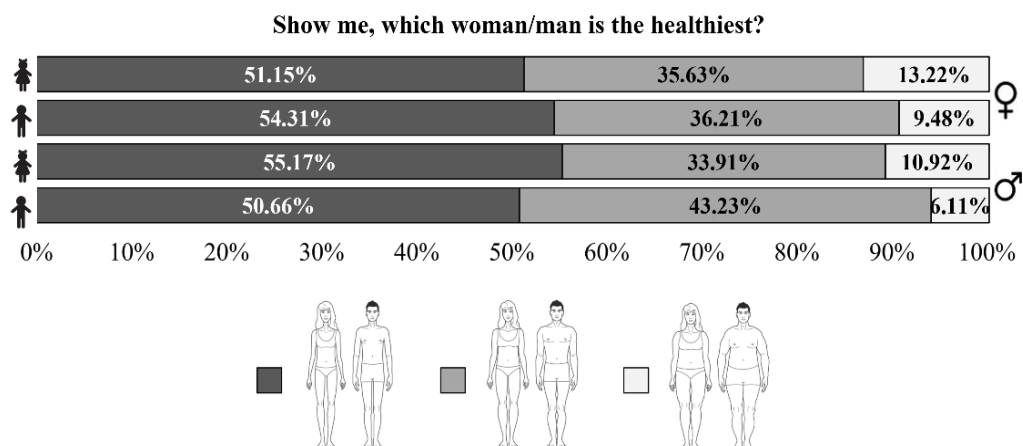
Variable		Mothers (%)	Fathers (%)
Education	Vocational	13.53	27.30
	Secondary	29.23	33.00
	Higher	57.25	39.70
Body fat percentage	Low	3.46	15.32
	Normal	38.75	48.19
	High	57.79	36.49
Physical activity	Low	29.02	14.25
	Normal	22.69	7.00
	High	48.28	78.74

**Table 2.** Descriptive statistics of parents' characteristics

Variable	M	Mdn	SD	Min	Max
Mother's age	35.17	35.00	4.94	23.00	50.00
Father's age	38.05	38.00	5.83	23.00	65.00
Mother's body fat (%)	31.55	30.70	8.93	8.40	61.40
Father's body fat (%)	22.56	23.30	8.32	4.20	61.70
Mother's physical activity – hours a month	27.30	29.10	13.62	0.00	61.40
Father's physical activity – hours a month	17.00	18.75	12.06	0.00	61.70

### 3.2. Ascribing attributes of healthy behaviour to different body types

First, we examined how children assessed the overall health of individuals with different body types (Question: *Show me which woman/man is healthier*; Figure 2).

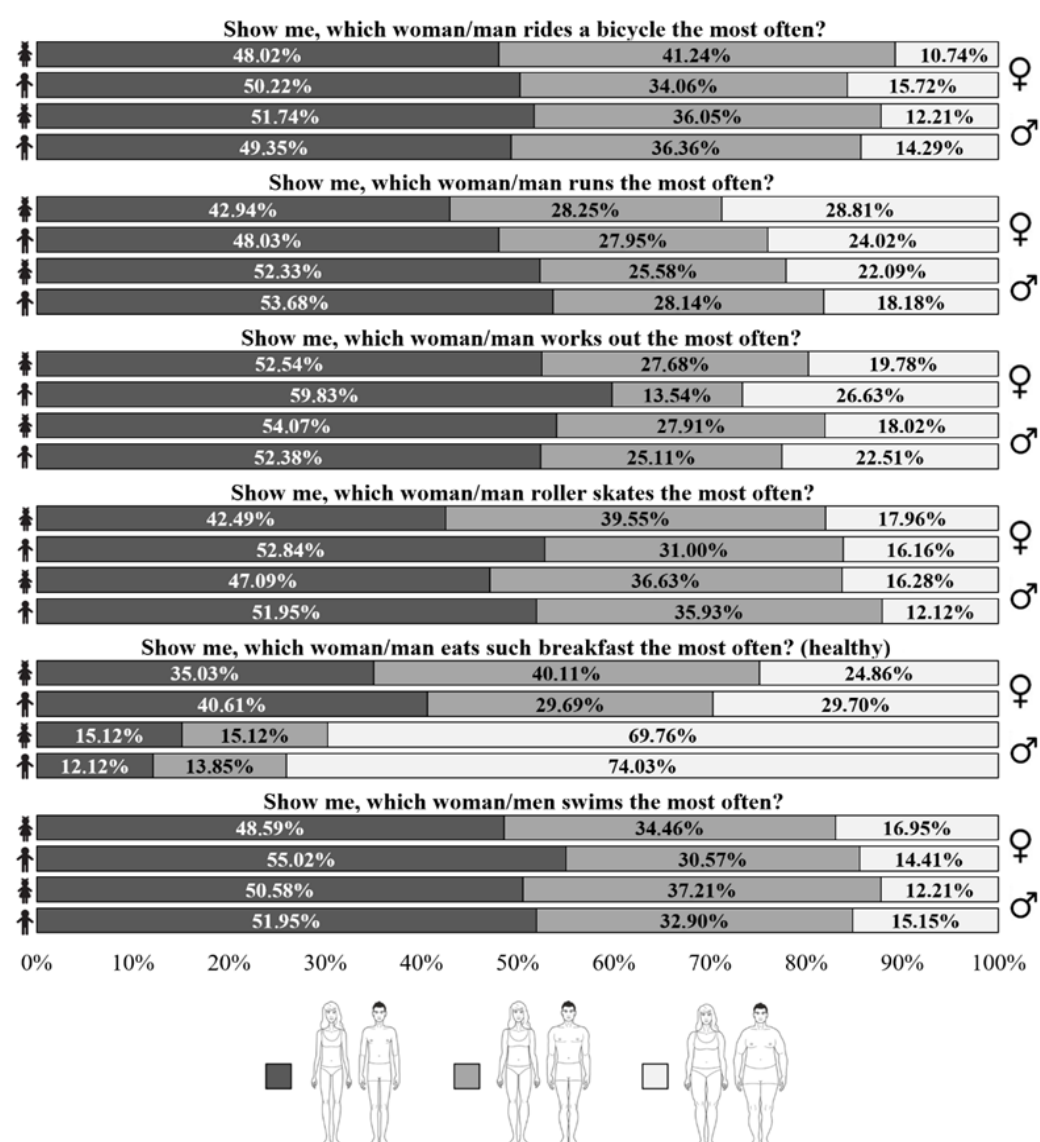


**Figure 2.** Assessment provided by girls and boys of overall health status of male and female silhouettes with different body types.



Independently of gender, the children were the most likely to indicate skinny bodies as healthier, both in the case of men and women. Bodies with normal weights were rated slightly less often as healthy ( $p > .05$ ). In comparison to these two body types, obese body type was selected the least frequently ( $p > .05$ ). In summary, there were no significant differences between sexes.

In the second step, we checked how children attributed pro- (Figure 3) and anti-health (Figure 4) behaviours to individuals with different body types (skinny, normal, overweight).



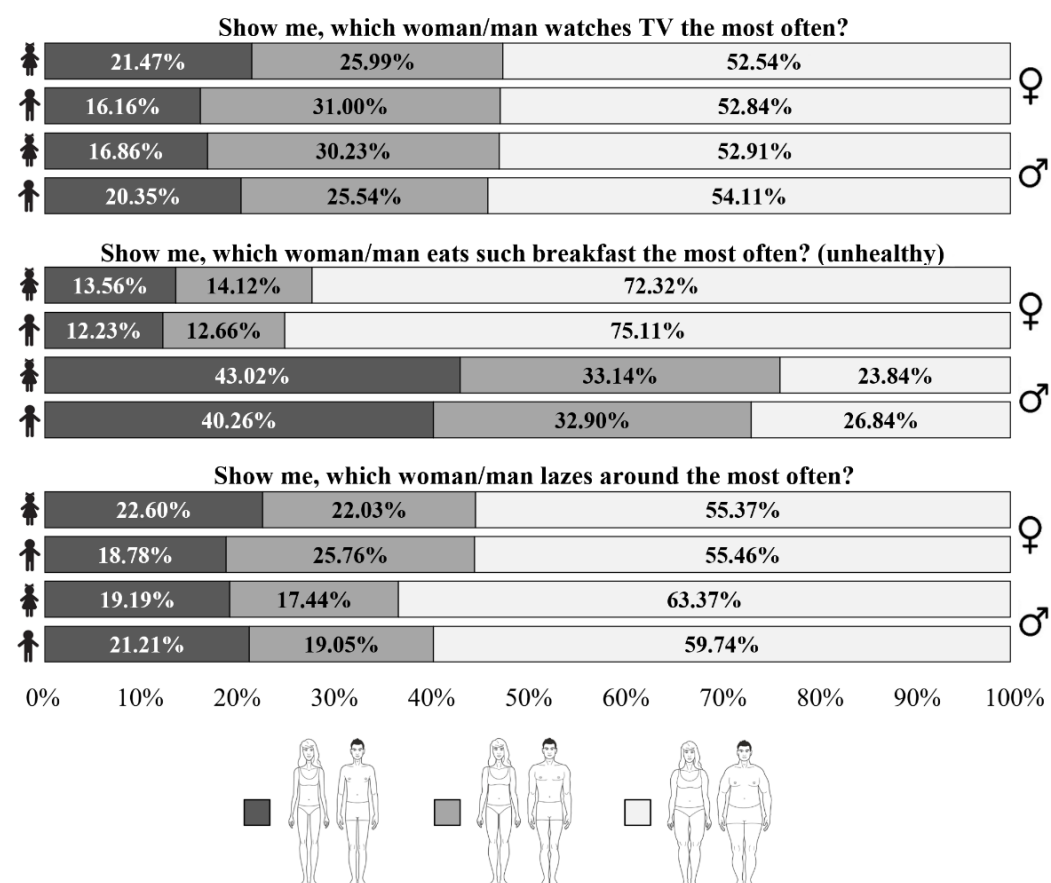
**Figure 3.** Body types selected by children when answering questions regarding pro-health behaviours

It is worth noting that when asked about participation in health-promoting PA (questions: *Show me which woman/man rides a bicycle/runs/works out/ roller skates/swims the most often*), the answers of girls and boys were similar, and the most frequently chosen silhouette was skinny rather than normal weight, and PA was not associated by children with individuals with obesity ( $p > .05$ ). However, we noticed some interesting differences between boys and girls. For the question *'Show me which woman runs the most often?'*, girls selected the obese silhouette more often than boys ( $\chi^2 = 0.72$ ,  $p > .05$ ), often spontaneously commenting that 'women run to lose weight'. For the question *'Show me which woman/man*

*works out the most often?* boys more often than girls connected obese silhouette with working out ( $\chi^2 = 6.33$ ,  $p < .05$ ) as they believed that *'obese women go to the gym to lose weight, but men who weigh too much go to the gym to gain muscle'*.

We received surprising answers to the question, *'Show me which woman/man eats such breakfast the most often?'*. The picture presented to children showed typical 'healthy breakfast' – a glass of orange juice, muesli and fresh fruit. In this case, children, regardless of gender, gave starkly different responses for the female and male silhouettes ( $\chi^2 = 83.22$ ,  $p < .001$ ). The healthy breakfast was associated with skinny and normal female silhouettes, although boys were slightly more likely to indicate the skinny one ( $\chi^2 = 2.40$ ,  $p > .05$ ). However, in relation to men, they gave answers in the vein of *'men don't eat like that'*, *'it's not breakfast for healthy men'*, *'only obese men who are trying to lose weight eat like that'* ( $\chi^2 = 0.51$ ,  $p > .05$ ). Thus, Polish five-year-old children did not associate healthy breakfast with men's eating habits/preferences.

Interestingly, we obtained the opposite results for *'Show me which woman/man eats such breakfast the most often?'* when the picture presented an unhealthy breakfast (typical fast food burger, fries, and cola; Figure 4). Fast-food breakfasts were associated with obesity in women (*'they eat this way, so they are fat'*), but not in men ( $\chi^2 = 94.55$ ,  $p < .001$ ). Children often commented *'he is slim, such food will not harm him'*.



**Figure 4.** Body types selected by children when answering questions regarding anti-health behaviours

It is worth noting that the anti-health behaviours presented in the question *'Show me which woman/man watches TV/ lazes around the most often?'* were mostly associated with obese silhouettes ( $p > .05$ ). Thus, children as young as five years old choosing the indicated adult figure may think that obese people are adults who are not physically active. It is clear that five-year-olds associate obesity with a lack of PA.

### 3.3. Health behaviours and appearance of parents' and children's perceptions of adult silhouettes: The role of passive modelling

To answer the first research question, statistical analysis was carried out to measure the relationship between the variables of PA, nutritional habits, and body fat percentage among parents (mother and father, independently) and the perceptions of adult body silhouettes by their five-year-old children. For this purpose, a correlation analysis was performed using Pearson's *r* coefficient; the values are presented in Table 3.

**Table 3.** Pearson's *r* coefficient between child's perception of pro- and anti-health behaviours and parents' characteristics

			Child's perception of pro-health behaviours						Child's perception of anti-health behaviours					
			BOYS											
			Female body type			Male body type			Female body type			Male body type		
			skinny	normal	obese	skinny	normal	obese	skinny	normal	obese	skinny	normal	obese
Parents' characteristics	Body fat %	Mother	.013	.108	-.152	.142	-.077	-.078	-.054	-.026	.048	-.048	.044	.004
		Father	-.060	.010	.001	.036	-.079	.044	-.105	.030	.019	.037	-.032	-.005
	Physical activity	Mother	-.060	.010	.001	.036	-.079	.044	-.105	.030	.019	.037	-.032	-.005
		Father	.013	.108	-.152	.142	-.077	-.078	-.054	-.026	.048	-.048	.044	.004
	Proper Nutrition Habits	Mother	.126	-.003	<b>-.206**</b>	-.022	.080	-.054	-.119	.079	-.003	.055	.030	-.068
		Father	<b>.164*</b>	-.128	-.148	.091	-.027	-.085	-.036	-.096	.055	-.009	-.107	.092
GIRLS														
Parents' characteristics	Body fat %	Mother	-.086	.065	.032	-.004	-.054	.073	-.017	.020	-.002	-.095	.044	.049
		Father	.082	-.090	-.001	-.030	-.046	.094	.058	-.142	.062	.067	-.009	-.051
	Physical activity	Mother	-.086	.065	.032	-.004	-.054	.073	-.017	.020	-.002	-.095	.044	.049
		Father	.082	-.090	-.001	-.030	-.046	.094	.058	-.142	.062	.067	-.009	-.051
	Proper Nutrition Habits	Mother	-.048	.026	.028	-.129	<b>.224*</b>	-.084	-.090	-.054	.114	.011	-.117	.076
		Father	.070	-.023	-.056	-.051	.035	.045	-.093	.096	.001	-.062	-.051	.096

Notes. \*  $p < .05$ , \*\*  $p < .01$

The values of the correlation coefficients indicated significant relationships between the parents' nutritional habits and the perception of adult silhouettes by their children of both sexes.

In relation to boys, two significant relationships were indicated. Interestingly, both were only concerned with the assessment of female silhouettes. The higher the level of the father's healthy eating habits, the more often the sons attributed health-promoting practices to the skinny female silhouette. In turn, the higher the level of healthy eating habits of the mother, the less frequently the sons associated health-promoting practices to obese female silhouettes (Table 3).

In girls, only one significant relationship was found, which was related to the assessment of the male silhouette. The healthier the mothers ate, the more often their daughters linked health-promoting behaviours with a medium-weight male figure (Table 3).

It should be noted that the intensity of the parents' PA and their objective and observable appearance parameters (body fat percentage) did not seem to play a significant role in the cognitive attribution of body shape to involvement in health practices.

A chi-square test of independence was performed to examine the importance of gender in the relationship between parents' health behaviours and appearance (passive modelling) and children's perception of adult silhouettes. The results confirm the importance of the child's gender in the above relationship. Five-year-old boys and girls perceived the bodies of men and women who eat healthy (health-promoting behaviour; Figure 3) or unhealthy

(anti-health; Figure 4) differently. In the case of boys, there was a  $\chi^2 = 46.81$ ,  $p < .001$  in unhealthy eating, and  $\chi^2 = 40.10$ ,  $p < .001$  in healthy eating. By contrast, in the case of girls there was a  $\chi^2 = 47.44$ ,  $p < .001$  in unhealthy eating,  $\chi^2 = 40.52$ ,  $p < .001$  in healthy eating. Surprisingly, despite the above significant differences, in other cases, our results did not confirm a significant impact of parental gender on the passive modelling of health-promoting and anti-health behaviours.

#### 4. Discussion

Currently, increasing efforts are being made for developing body-focused health-promoting attitudes in children. The obesity epidemic and sedentary lifestyle of children and adolescents have resulted in the World Health Organization disseminating recommendations on practices to promote PA and healthy eating habits [48, 49]. This study sheds light on the specificity of children's attribution of health behaviours to adult body shapes as influenced by their observations of their parents' lifestyle.

##### 4.1. *Healthy = skinny and gender matters*

Our study revealed that both boys and girls tend to view skinny bodies as healthy. In particular, the results indicate that five-year-old girls' perceptions of women's eating behaviours is important for their development and internalisation of the principle that a thin body is a healthy body (Figures 3 and 4). Most other studies involving children and adolescents also found that overweight silhouettes were considered 'unhealthy', while skinny figures were rated as attractive [50–52]. These results are consistent with the Objectification Theory of Fredrickson and Roberts [53], which confirms the importance of thinness as an important sociocultural factor of body attractiveness. Like many studies on this topic, our study confirmed the significant impact of sociocultural standards on the assessment of physical attractiveness, wherein a skinny body is promoted as attractive and normal, especially among girls and young women [54–57]. It has been found that the media and the toy industry have played a big role in propagating thinness as the standard for female physical attractiveness [58–60]. Harriger et al. [59] confirmed that exposure to images of Barbie dolls was associated with body dissatisfaction in children, especially in girls aged 5.5–7.5 years. In turn, Nesbitt et al. [58], examining a group of 6–10-year-old girls (slightly older than the participants of this study), found that the curvy Barbie doll, which has a fuller body, was associated with a positive emotional feeling related to the Barbie's figure. However, based on the perceptions of the surveyed 6–10-year-old girls, the original skinny Barbie dolls were the most desired and appreciated in terms of attractiveness. A review of the literature indicates that transgenerational trends in body image perception, which promote thinness as a beauty standard, especially among girls and young women, constitute a risk factor for the development of eating disorders [61]. Similar trends promoting thinness as an ideal of beauty were confirmed as risk factors for eating disorders in children. For example, Canals and Sancho [62] indicated that children are more likely to develop eating disorders if they see their parents struggling with their body image and chasing the ideal of thinness to become more attractive.

It is worth emphasising that most studies on the relationship between body shape and beauty and health focus on women and girls. In studies on men, the focus is more on the relationship between body appearance and fitness or health, rather than beauty [63–66].

A review of the literature indicates existing differences in findings on the perceptions of body image in boys and young men and the health behaviours used to maintain a lean or muscular male physique. Some researchers have indicated that males are more likely to have a more positive attitude towards their own body image compared to girls and women [25, 67]. However, some studies indicate that the differences in the body image perception between young girls and boys may be smaller than those between adolescent girls and boys [40, 68]. Other studies with boys and young men as participants indicate that having a lean and/or muscular body is an important sociocultural standard of male

attractiveness. Some studies have indicated that boys and men are pressured to work towards and attain the ideal of an athletic male figure with well-defined muscles [56, 69]. Social pressure to have an attractive male body shape is often associated with anti-health behaviours (including eating behaviours and PA), which are undertaken to attain the ideal male body [70]. This study yielded similar observations, because the findings indicate that proper eating behaviour in men (the so-called 'healthy breakfast') was associated with an overweight silhouette in the eyes of five-year-old boys. However, the same boys associated anti-health eating behaviours (the so-called 'unhealthy breakfast') with a slim male figure. Thus, it appears that unhealthy eating behaviours influence the distortion of the adult male body image in the assessment of adolescent boys and five-year-old boys. Furthermore, boys with eating disorders (having a distorted image of their own physique) are more influenced by incorrect perceptions of their own body than healthy boys [71].

The authors of this study remained consistent with the standards of research methodology adapted for young children [72] because of the use of the Beauty & Health Scale [45], which was adapted to the age of the examined children and their stage of development. Many studies show how the media influence behavioural patterns related to beauty and health [73, 74], and the role of family influence on these patterns is also emphasised [75–78].

In our own research, we focused on the role of passive modelling of 'healthy body' patterns by examining the relationship between the adult silhouettes indicated by children and the appearance and health behaviours of their parents. The relationship between parents' eating behaviours and children's choices was more clearly marked. This may be related not only to passive modelling, but also to the eating habits prevalent in the family [7, 79].

The most interesting result in this study is the different attribution of healthy eating habits to women and men. Unfortunately, despite many health campaigns [80, 81], the surveyed five-year-olds still believed that men do not have to eat healthy if they are not overweight. For men, healthy eating has been considered an 'intervention treatment'. Unfortunately, Polish pre-schoolers still exhibit a belief in the idea propagated in the last decade in newspapers that '*Real men don't diet*' [82].

We were surprised by the results indicating that the silhouette of the parent itself is not related to the attribution of adult shapes to specific health behaviours by their offspring. The findings of this study point to the need to build on this study further to verify the role of passive modelling through the health behaviours of parents towards children.

#### 4.2. Active involvement in PA rather than passive modelling

According to our assumptions, children believe that health is related to both eating habits and PA. Previous research has confirmed the role of parental involvement in developing children's active participation in sports activities [83, 84]. In connection with the research question, the statistical analysis of the research results aimed at verifying whether and how the parent's (mother/father) PA perceived by their five-year-old son/daughter is important in modelling their health behaviours related to PA. Surprisingly, passive modelling, the observation of parents' involvement (or lack thereof) in sport activities, was not related to children's knowledge about the relationship between PA and the possibility of being overweight or underweight in adults. It seems that the active influence of parents and beliefs developed by observing them, but with the element of co-acknowledgement in social activities, play a much more important role than passive modelling. Encouraging children to be physically active is important because many studies indicate the huge role of PA in children's healthy development [85–89]. Some studies indicate that parental modelling of PA (especially between ages of 7–9 years old) improves the child's sense of happiness and reduces his/her free time spent without PA [90]. Parents who actively spend time with their children are perceived in society as caring and attentive to their children's development, thus helping to include PA in the repertoire of behaviours practiced in leisure time [83, 90].

This study did not confirm a strong relationship between passive parental modelling of PA and the child's perceptions of the appearance of an adult's body. A similar trend was noticed by Durocher and Gauvin [91] because in both boys and girls, the relationship between parents' modelling of PA towards children and children's involvement (improvement and/or deterioration) in participating in PA was not confirmed. Additionally, they reported that boys trying to gain weight were more likely to engage in PA, but this did not exclude them from eating healthy food (or fast food).

This study is consistent with the trend noted in other studies such as Kim et al. [90], Wallander and Koot [92] and Durocher and Gauvin [91] that the parent's attitude and behaviour towards PA are important for the PA of the offspring. However, an important element in modelling these behaviours between parent and child is the parent's active attitude (especially towards PA); a passive attitude is not sufficient for the process of parental modelling to inspire PA.

#### *4.3. Limitations and strengths*

In this study, randomisation and blinding techniques were not used for the study sample due to the lack of a control group. The aim was not to compare children's perceptions of male and female body shapes across different age groups. A large group of mother-father-child triads was gathered to investigate the relationship between children's perceptions of male and female body shapes, correlating this with PA levels, eating habits, and maternal and paternal fat percentage. The lack of longitudinal studies was also associated with the conscious selection of the age group. However, it would be worthwhile to conduct a longitudinal study in the future and compare perceptions of the female and male bodies by children in middle childhood, taking into account the PA, the measurement of body fat, and the parent's eating habits. The differences in the perceptions of the parents' bodies by children of different ages and whether body fat, eating habits, and PA depend on the child's age can be examined. A longitudinal survey is associated with the risk of the respondents' high motivation to complete the survey procedure. Making participation in the study interesting and not boring is especially important when the participants are children in the middle childhood stage. This study questionnaire had to include specific questions and could not have been too long because it was necessary to maintain the interest and concentration of five-year-old children. The transverse nature of the study was related to the desire to study a large group of mother-father-child triads and to obtain the most accurate results subject to statistical analysis.

### **5. Conclusions**

Childhood is a particularly important period for developing health behaviours (nutrition and PA) that last into adulthood. Engaging in healthy behaviours reduces the risk of lifestyle diseases and improves quality of life [85, 93]. In the era of increasing civilisational threats resulting from an anti-health lifestyle, sedentary behaviour [94], excessive media use [94], unhealthy eating [96, 97], and lack of PA [98]) maintaining good health is a challenge. The family plays a key role in instilling proper health behaviours, and thus is an important contributor to public health [7, 84]. The niche nature of this study confirms that the family is an important environment for establishing the first health habits (pro-health and/or anti-health), in particular with regard to PA in the family.

WHO recommends that children and adolescents participate in an average of 60 minutes of PA (mainly aerobic) and engage in exercises strengthening the musculoskeletal system at least thrice a week [48]. In the process of disease prevention and promotion of health-consciousness and physical exercise in the family, health education that promotes and instils the habit of regular physical exercise in young children plays an important role. Implementation of PA health interventions for parents is also necessary because they have a direct impact on their children's PA development [99, 100].

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