



# Tailor-made for children. Designing a pictorial questionnaire to explore eating habits, lifestyle, and body perception

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## Abstract

The article presents the results of a classroom-based research within the use of a pictorial questionnaire. The quanti-creative study has investigated the body perception, eating habits and lifestyles of a sample of Italian children attending the primary school. Data were analysed to explore how with this technique the researcher can overcome existing problems related to both purely quantitative and creative approaches to elicitation, offering broadened analysis to obtain collective (measurable) and individual (perceptions, emotions) information embodied in children's life courses and promoting active participation. The pilot study presented, therefore, aims to open the discussion on how art-based research can also involve quantitative methods to support educational interventions on classroom basis, offering adequate tools to observe children's degree of reflection, awareness and learning. The findings showed how pictorial questionnaire frames the classroom-based research by identifying and containing moments of tension, activating an appropriate and engaging learning experience and ensuring the integrity of the knowledge produced.

**Keywords** Pictorial questionnaire · Classroom-based research · Eating habits · Lifestyles · Body perception

## 1 Using pictorial questionnaire in the social research

In the past two decades, social researchers have increasingly explored how to include children in social research by networking traditional with art-based methods. Different scholars (Tang et al. 2024; Cannoni 2024) point out that children, as early as age 3, begin to make connections between marks, images, and objects. In their “pictorial stage” (Cannoni 2024), children acquire and develop the skills to communicate reasonable and accurate opinions and meanings about their life experiences. However, they can provide reliable answers in ways that must be understandable and accessible for their age (Massey 2022).

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Qualitative together with art-based research has been often preferred with children by allowing for in-depth understanding of their complex experiences, subjective perspectives, and motivations in ways that purely quantitative methods, which focus on numerical data and large groups, cannot (Sevón et al. 2025). In particular, the strength of quali-creative methods would be to provide rich, descriptive data, such as children's own words and pictures, capturing the nuanced details of their lives and using age-appropriate techniques to understand directly their perspectives (Sevón et al. 2025). However, the limitations of quali-creative research with children include ethical challenges such as the biographical barriers to find difficulties in expressing exclusively by words; psychological stress in sharing personal experiences orally and out loud in a one-to-one encounter or among other children or people, and practical issues in the time-consuming of collecting data on samples higher than 10, and in generalizing common results (Sevón et al. 2025).

At the same time, a purely quantitative elicitation approach could negative influence the answers' process (Tourangeau et al. 2000c). On the one side, questions read in auditive-only form while benefit population subgroups with widespread literacy problems, can also burden the ability to listen to long, multi-answer, or complex questions without simultaneous viewing and reducing comprehension. When questions are only read out loud, respondents have less control over the options and may consider only those at the end of the list or those they remember (Tourangeau et al. 2000c). On the other side, visual-only elicitation, presuppose that respondents can read drawings, symbols, and numbers, interpret them independently by providing accurate answers. These are far from trivial requirements, and the general population often possesses them only to a very limited extent (Tourangeau et al. 2000d). Moreover, respondents—if not stimulated—are likely to simplify the task of answering as much as possible. Consequently, the collection of objectives, measurable data, intervals, or rounded values will make assessments on a few simple principles, select answers from a set of options, or adopt response strategies that completely avoid serious consideration of the question not highlighting the individuality of each participant's inner world. Even for temporal and behavioral questions, using a purely quantitative method may require special effort that would make responses less accurate (Tourangeau et al. 2000b). Indeed, to encode the date of an event or a factual attitude, the respondent must have it well embodied into the autobiographical memory, in relation to other events, datable periods, or relevant information. Their memories retrieval depends on how much effort they are willing to devote to these calculations. The greater the memory effort required by a question, the less accurate the respondents' answers could be (Tourangeau et al. 2000a, 2000b). Since the information available to them may not fully determine the date or duration, or they may have never considered a specific question before, they could simplify assumptions by fostering errors or static data.

Brenner (2017), then, analyzing surveys, observed a growing “narrative response bias” with an overestimation of normative behaviors considered socially acceptable. A trend that he was able to in-depth explore by using qualitative techniques.

The quali-creative approach to observe research with children has therefore long left the potential of quantitative methods aside. However, data collection that combines subjective perceptions with objective statuses can provides as well the basis for exploring the embodied meanings practiced as individuals or groups in widely shared or discordant decisions.

In both qualitative and quantitative methods, data and information acquired are incomplete representations of meanings (Vaisey 2009) based on selection (the aspects that the

researcher chooses to include and to ignore), translation (the process of converting narratives into different forms like field notes, Likert scales, or interview's answers), and disposition (the way in which the selected and translated fragments of real life are arranged). Actually, no survey, interview, photograph, or autobiography alone can fully capture the conscious and unconscious worlds in which culture shapes action.

In line with Vaisey's (2009) analysis, sociologists should sometimes go beyond traditional research methods and techniques. In the dual-process sociological model (Vaisey 2009), indeed, socio-cultural orientations could lie in non-linguistic form, stored in procedural or in non-declarative memory with the potential to shape people perceptions and reactions rapidly or slowly. For these reasons, complementing traditional methods with what McDonnell (2014) calls "productive methods" can stimulate moments of shared cognition, both automatic and deliberative, and resonant, making cultural processes and their impact on action legible. Creative techniques by engaging with traditional methods better reveal how culture shapes action and develop new ways to solve the theoretical issues discussed above. Specifically, arts-based elicitation can surface unconscious cognitive processes to address sensitive, embodied, and difficult-to-articulate issues, as well as to make automatic and deliberative decision-making process visible (Vaisey 2009).

Moreover, on group basis, collective production is crucial. People are stimulated to verbalize meanings that would otherwise have been part of hidden internal cognitive processing.

Art-based elements like faces, cartoons or smileys and pictorial scales have been previously explored to measure subjective information like emotions, satisfaction, performance, pain levels or hedonism from children and/or adults. Conversely, the MacArthur Scale (Galvan et al. 2023) is among the most exemplary attempts at graphic social instruments to capture subjective perceptions on a quantitative scale. It is single-item measure for assessing subjective social status beyond objective indicators. However, even if the MacArthur Scale is widely used in several research fields, including well-being and physical health in adults and youth with positive predictive outcomes, challenges include potential non-response and negative feedback from participants, particularly youth who feel embarrassed or that the scale is divisive. Some researches (Moss et al. 2023; Cardel et al. 2018) show both differences in how the ladder is interpreted across age groups and subjective social status as a sensitive topic may trigger discomfort, leading to concerns about data validity.

Bosch and Revilla (2021), therefore, offer a complete overview on functional and critical aspects of the visual elements to carefully consider. Emojis can represent not only facial expressions but also a huge range of objects, animals, foods and can be used for more types of scales by providing new opportunities for open-ended questions and increasing the quality of responses to remark emotional intent. They represent a complementary tool for non-verbal cues that can help to disambiguate the communicative intent behind the message, gather further information from answers and reduce the survey breakoff (Bosch and Revilla, 2021). Pictorial scales (emoji, stars, cartoons)—as analyzed in several sociological studies (Tang et al. 2024; Brecic et al. 2022; Chan et al. 2022; Morera-Castro et al. 2018; Nalam et al. 2017)—stated how images to measure eating habits and lifestyles, emotions and therapeutic pathways are an effective thermometer to shed lights on dichotomies like "balance"; "imbalance," "positive"; "negative" in a dimension that is not solely extractive.

However, many scholars (Bosch and Revilla, 2021; Toepoel et al. 2019; Reynolds et al., 2011; 2009) underline to be carefully in using smileys with specific emotional expressions or children's popular characters for their potential influence and aesthetic attraction within

the responses. Then, when choosing an already standardized design (e.g., from Unicode) the criteria of inclusion or exclusion is decided by a third actor not considering the nuances of semantical interpretations between different sample and countries (Bosch and Revilla, 2021). Furthermore, the high degree of sentimental and semantical misconstrual could create an ambiguity of interpretation render survey answers more difficult to interpret. It is, thus, crucial to well design pictorial scales to avoid biases.

This article highlights how the quanti-creative approach applied in a classroom-based research that integrates an individual-level questionnaire with qualitative and art-based insights, is an area to be explored. In fact, it can overcome existing problems related to both purely quantitative and creative approaches to elicitation, offering broadened analysis to obtain both collective (measurable) and individual (perceptions, emotions) information from respondents. Quanti-creative elicitation methods conducted in classroom can improve the accuracy of survey responses, including reducing Brenner response bias, by encouraging respondents to reflect more deeply on their answers, recall details more effectively, and overcome biases such as social desirability or acquiescence. Techniques such as formulating hypothetical scenarios, using open-ended questions, or employing multiple data collection methods can promote more complete and accurate self-reports.

Within large samples, pictorial questionnaires are increasingly being used to assess children's agency, a set of dynamic and processual capabilities to act, make choices and decisions that pay attention on the ascribed meanings and actions in different contexts (Tang et al. 2024; Montreuil and Carnevale 2016; Hall et al. 2016).

Pictorial questionnaires have a predominantly standardized architecture by interspersing discursive and explanatory questions with pictures produced or to be produced. They offer a means to aggregate and explore objective (behavior-based) questions (Chan et al. 2022; Morera-Castro et al. 2018; Nalam et al. 2017) that concern observable and measurable facts and subjective (opinion-based) questions that explore perceptions, feelings, and personal interpretations as the individual's inner world (Hall et al. 2016; Ghiassi et al. 2011; Chambers and Craig 1998). With an interface very similar to that of the didactic worksheets, pictorial questionnaires help children overcome the cognitive barrier of completing a traditional survey, lower the level of difficulty and increase their degree of autonomy (Zhan et al. 2024). For these reasons, this instrument is perceived as more enjoyable and less cognitively demanding (Maćkiewicz and Ciecuch 2016; Cecil et al. 2015; Reynolds et al. 2011; 2009). Moreover, storytelling for and with pictures is considered a way to increase the amount of information provided by children in the reenactment of personal experiences (Cannoni 2024; Tang et al. 2024; Reynolds et al. 2011).

Since the early twentieth century, within the framework of neuroscience studies (Cannoni 2024; Maćkiewicz and Ciecuch 2016), some authors have constructed an objective way of interacting with children through pictograms capturing their qualitative peculiarities and quantitative regularities. Works of Massey (2022), Zhang and colleagues (2002), Chambers and Craig (1998) delve into how the use of pictorial questionnaires by teachers, psychologists, and researchers facilitates responses in setting where reading or telling orally in groups might create barriers. Visual literacy, in fact, is already highly developed at an early age stage (Lewis-Dagnell et al. 2023; Nalam et al. 2017). Among 6 to 11 years old, children draw what they know through what they see. Thus, the process of reading, encoding, and interpreting visual media is crucial to promote a better understanding of various social and health issues.

Therefore, if accompanied by an appropriate degree of clarity in the administration, pictorial questionnaires allow the researcher to focus on the children's engagement in sharing knowledge and expertise (Tang et al. 2024; Lewis-Dagnell 2023; Massey 2022).

The quanti-creative research design and its administration also pose some significant challenges that engage the researcher on several levels. For these reasons, it is necessary to constantly take into account (1) the children active participation; (2) the adult-child power differential in the specific setting; (3) the different socio-cultural resources and knowledge available in the course of interactions (4) the construction of a trust research setting, safe and comfortable (5) a meticulous choice on visual and textual languages and (6) the ethics and reflexivity dimension of the research.

Analytically, this article first presents the methodological basis of an Italian pilot study, highlighting how the pictorial questionnaire is designed to operate in the participatory classroom-based setting and, then to give a primary theoretical contribution. By integrating pictorial scales and drawing elicitation, it argues how this tool can guide the research-learning in the classroom and focuses on children's experiences. Secondly, it discusses the ethical implications in the iterative and dialogic process of research paying attention on reflexivity and tensions between perception, representation, agency, and vulnerability. Lastly, it explores data and information emerged by intersecting the quantitative and art-based approach for potentially broaden its applicability.

## 2 Methodology

Based on the literature discussed above and on a previous study about food habits, lifestyles, and childhood obesity (Plava 2023), this article aims to investigate the potential of a quantitative method as the questionnaire in its artistic and participatory implications. A pilot study developed within the Italian region of Emilia-Romagna, in the city of Rimini, will be presented. As the in-depth study by Plava (2023) points out, there are multiple grants obtained by canteens and initiatives in the Rimini area to support nutrition, lifestyles, and to prevent childhood obesity. For many years, Rimini has been a virtuous city in promoting healthy habits, starting from primary school. Specifically, by sustaining the use of organic food in school canteens, adhering to educative projects on physical activity as well as boasting a network strategy for supporting childhood overweight or obesity issues considered "country example" for the WHO (2019). A cutting-edge service, then, that does not end on food consumption's education.

But how do children embodied, and internalized culture inform their opinions and motivate their behaviors? And how can a pictorial questionnaire elicit subjective responses compared to objective scales?

### 2.1 Instrument

The pictorial questionnaire was designed on previous four-year empirical research conducted between 2019 and 2023 with a team of parents and medical, educational, school catering, policy professionals (Plava 2023).

The choice to develop a child-friendly and art-based questionnaire has been motivated by: (1) at least up to age 11, children find it difficult to express their experiences exclusively

by words feeling uncomfortable sharing their perspectives orally, and the use of drawings alone would force the children expression of their inner world in front of the the audience class without the possibility to decide if do it or not and having the necessary time to create a trust relationship even with the researcher; (2) the need to structure a “researching to learn” path to explore—from a self-reflection—socially shared everyday practices leaving the children free to contribute to the discussion within the class.

The aim of this study was to investigate the potential of art-based quantitative methods in classroom research capturing the nuances of children aged 6–11 years’ eating and lifestyle habits and body perception. Specifically, the research was guided by the following questions:

1. How can the use of quanti-creative methods facilitate the children’s agency and externalization of opinions and behaviors on body perception, eating habits and lifestyle in a classroom setting?
2. What are the methodological and ethical advantages and limitations of using this type of approach?
3. Which potential further applicability do the quanti-creative method have to elicit information?

The pictorial questionnaire is consisting of two main sections: (1) socio-demographic and (2) experiential. At the temporal level, the effort required is to recall events related to the day of the research or the day before. The 40 questions focused on:

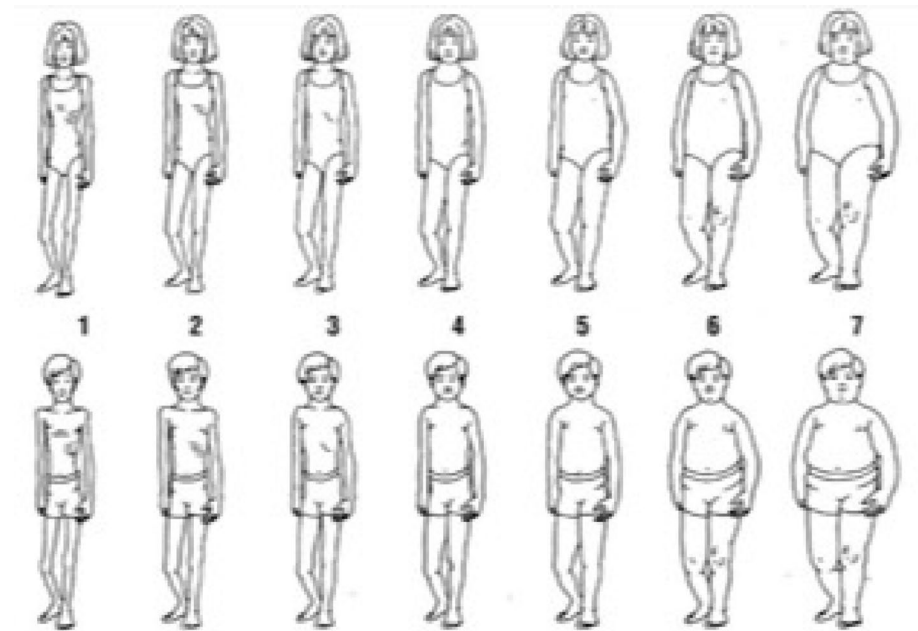
- a) Body satisfaction and perceptions of the child and of one or both parents.
- b) Embodied eating and lifestyle habits retraced on a typical day.

The pictorial questionnaire was designed by prioritizing the communicative, expressive, and generative dimension to: (1) capture, in a structured way children’s everyday life opportunities and embodied practices, (2) reflect on how this instrument can offer visual and linguistic stimuli useful for investigating children’s bodily perception and satisfaction (3) assess the children’s agency in classroom on health topics.

Questions were manually written and drawn in the original hand block letters creating more proximity to the children’s visual literacy, interest in reading and answering but avoiding emoji or cartoon faces that could influence responses. For body images, the choice was to use the validated Figure Rating Scales (FRS) based on Body Mass Index (BMI) percentages by Collins (1991) for children and by Stunkard, Sorenson and Schulsinger (1983) for adults. Furthermore, for the adults, Connell et al. (2006)’s Body Shape Assessment Scale (BSAS) has been used.

## 2.2 Silhouettes and shapes

Questions about children’s body perception and satisfaction were supported by Collins’ (1991) pictogram FRS consisting of seven female/male images (Fig. 1) representing a female and male child ranging from underweight ( $N=1$ ) to obese ( $N=7$ ). The codified silhouettes represented a weight: F1 and F2=underweight; F3 and F4=normal weight; F5=overweight; F6 and F7=obese.



**Fig. 1** Collins' Figure Rating Scale (FRS)

Children were asked to identify their body perception in two identical sets: in the first, they chose the representation more closely to the real (*how did you see yourself in the mirror this morning?*<sup>1</sup>) and in the second the ideal one (*how would you like to be?*<sup>2</sup>). The parents' body, perceived by the children, were supported by two scales: FRS assessment scale developed by Stunkard, Sorenson and Schulsinger (1983) (Fig. 2) and BSAS by Connell et al. (2006) (Fig. 3). Firstly, children have identified their mother and/or father's weight among 9 silhouettes of women and men ranging from 1 (underweight) to 9 (obese) (Fig. 2). Specifically, the silhouettes represented values between 17 and 33 kg/m<sup>2</sup> coded as follows: N 1 = underweight; N 2, 3, 4 = normal weight; N 5, 6, 7 = overweight; N 8, 9 = obese. Subsequently, the parents' body perception was measured among different shapes (Fig. 3). Shapes were used both to broaden the choice on less standardized bodies and as a "control" to match shapes with silhouettes. The shapes provided were upward triangle, rectangle, hour-glass, pear and apple coded as follows:

- (a) upward triangle = the hip circumference is greater than the chest, and the waist is not prominent; when the person gains weight, tends to be disproportionately in the hips, rear, and thighs;
- (b) rectangle = the circumference of the chest and hips is identical and the waistline is almost non-existent; when the person gains weight, it is distributed evenly, although with excess, the stomach may protrude;

<sup>1</sup>In italics, the researcher's words during the administration.

<sup>2</sup>Ibidem.

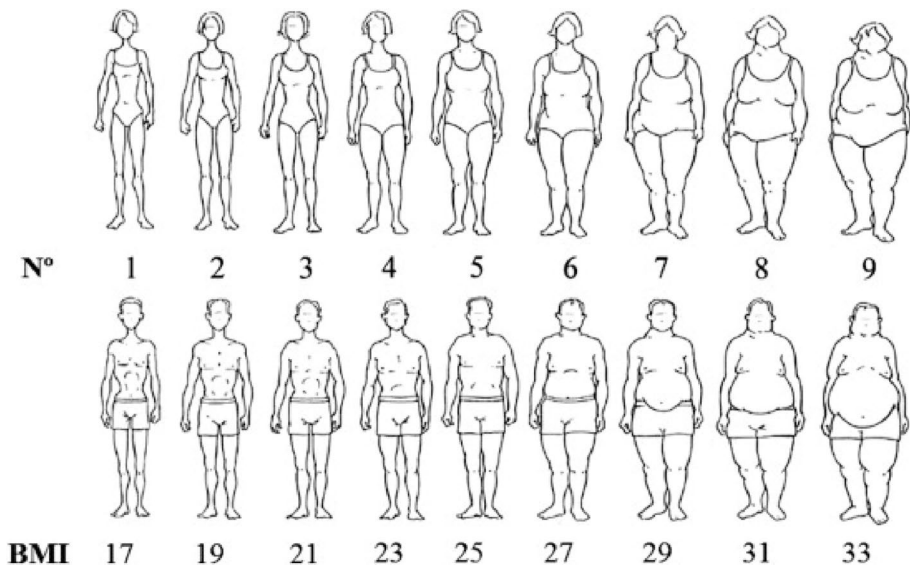
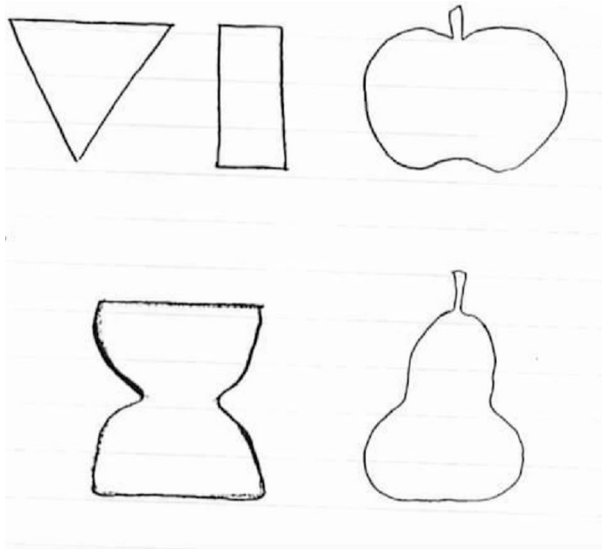


Fig. 2 Stunkard, Sorenson e Schulsinger's Figure Rating Scale (FRS)

- (c) hourglass=the circumference of the chest and hips is identical but the waistline is pronounced; when the person gains weight, it is distributed across the shoulders, chest, hips, and buttocks before affecting the waist and stomach;
- (d) pear=the upper body is narrower, the waistline is slim but the hips are wide when the person gains weight, it tends to accumulate it in the lower part of the body
- (e) apple=the chest circumference is greater than that of the hips, and the waistline is not prominent; when the person gains weight, it tends to be disproportionately in the upper arms, shoulders (back), and chest (not necessarily the breasts).



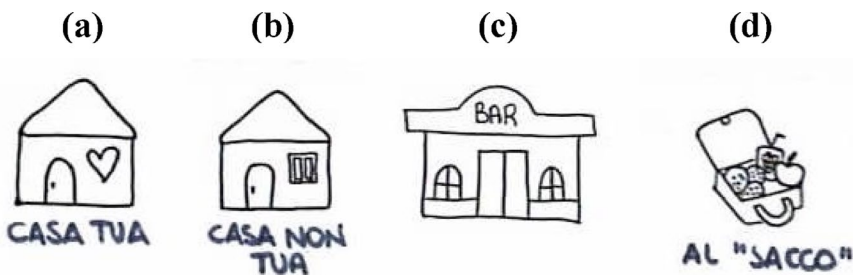
**Fig. 3** Bodyshapes based on Connell and colleagues' Body Shape Assessment Scale (BSAS)

### 2.3 Picture elicitation: scale and drawing

Picture elicitation was realized through scale and drawings either handmade by the researcher or by children. The visual repertoire on behavioral habits has been based on a thorough desk analysis of the scientific literature (Chan et al 2022; Morera-Castro et al. 2018; Brecic et al. 2022; Dudley et al. 2015; Zhang et al. 2002). Specifically, drawings consist of breakfast consumption location (Fig. 4), breakfast foods and beverages options (Fig. 5a), foods and beverages mid-morning snack (Fig. 5b), home-school transportation (Fig. 6), groceries shopping carts.

Some eating habits and lifestyles were directly drawn by children to stimulate their creativity and imagination but also to fill potential visual gap.

The children were asked to possibly supplement the breakfast and mid-morning snack grid with foods and beverages that they had not been included but they consume, the food



**Fig. 4** Breakfast consumption locations. In the pictorial scale from the reader's left: (a) your house (b) house but not yours (c) café (d) grab and go breakfast



**Fig. 5** Foods and beverages options for breakfast (a) and for mid-morning snack (b). Grid (a) is divided into beverages, powders and creamy spread, and foods. Grid (b) generically introduces foods and beverages for mid-morning snack



**Fig. 6** Home-school transportation. In the pictorial scale from the reader’s left: (a) on foot (b) by riding the bike (c) by bike not riding (d) by bus (e) by car

they like most and least in the canteens, the foods they like that cannot be missed in their dream grocery shopping cart and those that cannot be missed for healthy and nutritious growth shopping cart, and, which foods and/or drinks they would cook “tonight” if they were in charge of preparing dinner.

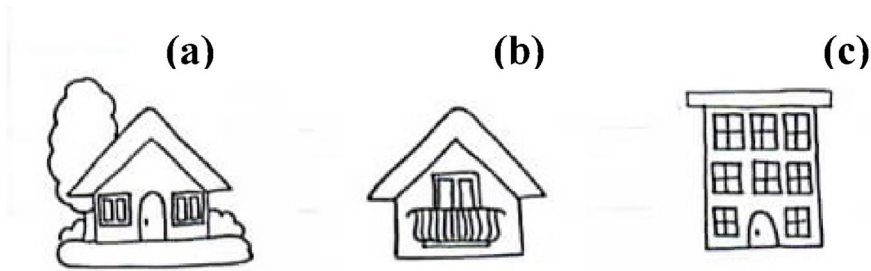
**2.4 Procedure and sample**

The quanti-creative approach design is part of a classroom-based research organized among 93 children attending a primary school in the city of Rimini (Emilia-Romagna, Italy). In June 2023, the pictorial questionnaire has been distributed in 4 primary classes from second to fifth grade. Expressly, 25 second graders, 22 third graders, 24 fourth graders and 22 fifth graders were involved (Table 1). Among these 93 participants, 48 were females and 45 males. Table 1 shows the distribution of participants according to gender, age, and class attended.

After first explaining and showing to the Head Director, the deputy Head teacher, the parents and teachers delegates of the school, the purpose of the research and the pictorial

**Table 1** The participating children population distribution

Class attended	6–7 years old		8–9 years old		10–11 years old		Total per class	
	Gender	F	M	F	M	F		M
Second grade		3	3	13	6	/	/	25
Third grade		/	/	9	13	/	/	22
Fourth grade		/	/	5	7	4	8	24
Fifth grade		/	/	/	/	14	8	22
Total per gender		3	3	27	26	18	16	<b>93</b>

**Fig. 7** Type of home inhabited by respondent children

questionnaire, 4 sessions called “explore and learn healthy habits” lasting 1 h 45 min were organized. Each session was supervised by the teacher in charge but personally managed by the researcher who distributed, administered, guided, and stimulated the pupils. To promote pupil comfort and create as immersive an experience as possible on par, the compilation and dialogical inputs were encouraged dynamically, going around the classroom, approaching those who asked for explanations and performing each question in a friendly manner, eroding by degrees hierarchical barriers. In this way, distance was slowly reset to zero and an atmosphere of welcome and reciprocity was created. In the second grade, the time for explanation and compilation was expanded than in the upper grades where concepts and topics were assimilated more quickly.

Most of the participants live in Rimini with both parents ( $N=10$ ) to which, in some cases, are one or more sibling(s) ( $N=28$ ) and other family members including pets ( $N=39$ ). Other participants live with only one parent ( $N=3$ ), with a parent and one or more sibling(s) ( $N=2$ ), with one parent, siblings and other family members including pets ( $N=9$ ). Only two children live with guardians.

As from Fig. 7, children were asked to identify the type of house inhabited: 51 live in a house with a garden or yard (a), 31 with a terrace (b), and 11 in an apartment with no neighboring open space (c).

## 2.5 Reflexivity and ethical considerations

In recent years, reflexivity has emerged as a crucial practice that can help researchers examine their own role and situation to better understand how they influence what is relevant in the field, how their choice of a unit of analysis is intertwined with their embodied subjec-

tivity (Markham 2020) and adapt the research process to be more sensitive to participants' potential discomfort.

Both for youth and adults the use of pictorial scale—as demonstrated by the sound literature around the use of the MacArthur Scale of Subjective Social Status—could include potential non-response and negative feedback from participants. Not only the feelings and perceptions in the way of submission but the scale itself could create a divisive space. For both youth and adults, pictorial questions behavior-based can be sensitive and may trigger discomfort, cultural and contextual differences leading to concerns about data validity (Galvan et al. 2023; Moss et al. 2023; Cardel et al. 2018). Especially for children, the inadequacy of the pictorial scale, of abstract concepts and of the methods for evaluating them impacts the way they experience and are involved in research.

For this reason, it is fundamental that the knowledge generated by the research activities of this study be compared to the positioning, the bodily and biographical experience of the researcher who has intervened on the spatial, temporal, and social coordinates of the participants and has designed and adapted the research process (Markham 2020; Graham et al. 2015). Moreover, it is essential to act in the best transparency by clearly explaining the purposes, methods, instruments and mode of engagement of the participants to the research in order to obtain informed consent in this specific case from parents or legal guardians and, depending on the participant's age, their consent as well. The participant's privacy and protection are paramount, and the data must be treated with the utmost confidentiality.

Then, "taking a reflexive approach" using quanti-creative methods means paying special attention to the implications of the epistemological, ethics and methodological choices in the decision-making.

In this research, a key element of reflexivity is the novelty of the methodological approach selected for the participants. The pictorial questionnaire, despite its growing recognition within social research, had to be properly introduced for the participants involved specially to differentiate it well from a didactic worksheet. Then, it was necessary to work on managing moments of uncertainty and discomfort during the classroom-based sessions to (1) shorten the detachment between researcher and participant and, in the first phase, the fear about the appropriateness of the skills in relation to the expectations; (2) to overcome some moments of difficulty when dealing with more delicate issues such as body perception, the relationship with parents, the nutritional self-approach. These moments of hesitation required the researcher to navigate carefully, providing reassurance and guidance aligning with Montreuil and colleagues (2021) and Phelan and Kinsella (2013)'s considerations who emphasize on the ethical research imperatives of sensitivity. Furthermore, gender, age, and decades of researcher's experience with children in schools and summer camps played a key role in managing and in progress-adapating the unexpected by resetting barriers with the classroom. This, in line with many scholars (Bussu et al. 2021; Montreuil et al. 2021; Ward 2016; Stahl 2016) who argue how experience, awareness and respect of the participant identity's traits are roots of good research relationships.

Managing moments of tension balancing encouragement and respect for individual boundaries, ensures the development of participants' feeling of trust, safety maintaining and agency over self-narratives (Lewis-Dagnell et al. 2023). This required ongoing negotiation grappled with the knowledge creation, free expression, and mitigation of the potential discomfort.

The pilot study was pretested with 20 children aged 6–11 years old. Then the whole material has been submitted and validated to the School Head Director, the parents, and teachers' delegates. After the no impediment to proceed, parents and children were fully informed of the purposes and storage of the data and images produced within the research. The deputy Head teacher distributed and collected the expressed consent sheet to join the research activity, where privacy and confidentiality aspects in the preservation and dissemination of the collected data were highlighted. The consent forms have been filed by the School Head Direction.

## 2.6 Data analysis

The pictorial questionnaire was transcribed to create a data matrix. The items were, then, aggregated and statistically analyzed within SPSS software where frequency analysis was performed, and some variables were crossed into contingency tables. In order not to miss crucial graphical meanings, specific qualitative variables were selected and coded using MAXQDA software. Finally, we proceeded to triangulate different data to offer descriptive, numerical, symbolic and discursive interpretation.

## 3 Results

By analysing and combining different type of data, in this section, the aspects of (1) body perception, (2) eating and lifestyles habits, and (3) embodied key messages, are showed.

### 3.1 Mirror, mirror on the wall

In the first FRS (Fig. 8a), in which children were asked to select the silhouette that best represented their “real” body perception, they projected themselves as in Table 2. And almost everyone self-associated a “underweight” or “normal” weight.

In the second FRS (Fig. 8b) in which children were asked to select the silhouette that best represented the “ideal” body perception, they self-projected as in Table 2. Again, almost everyone indicates underweight or normal weight levels. Looking at the main shifts in the sample size, 7 girls who represent themselves as “overweight” or “obese” in the real mirror, seek for ideals underweight or normal weight. Same attitude among 7 boys who represent themselves as “overweight” or “obese” and move toward underweight or normal weight when they chose “how they would like to be.”

Regarding parental representation, children were asked to firstly indicate a silhouette and then to associate a body shape with it.

In Table 3, most of children assign their parents a silhouette that falls within the criteria of normal weight (61.3% mothers; 60.2% fathers) or overweight (31.2% mothers; 30.1% fathers). Focusing on shape (Table 4), the highest percentages of normal weight and overweight are associated with the rectangle (59.1% mothers; 61.3% fathers), which represents a body proportionate between the highest part, waist, hips, and legs, or the hourglass (22.6% mothers; 16.1% fathers), which defines bodies whose waist is narrower than their shoulders and legs.



**Fig. 8** Example of Figural Rating Scale options. In the options: (a) “when I look in the mirror, I see myself, more or less, like this” (b) “but I would like to be, more or less, like this”

**Table 2** Children real and ideal self body perceptions distribution

Weight perception	Female children		Male children	
	Real	Ideal	Real	Ideal
Underweight (Figs. 1, 2)	5	8	8	10
Normal weight (Figs. 3, 4)	29	33	25	30
Overweight (Figs. 5)	13	7	10	5
Obese (Figs. 6, 7)	1	0	2	0
Total	48	48	45	45






**Table 3** Children's perception of their mother's and father's weight (silhouettes)

	Frequencies %	
	Mother	Father
Underweight	4.3	6.5
Normal weight	61.3	60.2
Overweight	31.2	30.1
Obese	0	0

### 3.2 The typical children day

The typical day present or preceding the administration session is the space–time setting to explore choices' opportunities in children's habits and lifestyles.

**Table 4** Mother and father's shapes according to children perception

SHAPE	Frequencies %	
	Mother	Father
 Rectangular	59.1	61.3
 Upward triangle	4.3	7.5
 Pear	8.6	7.5
 Apple	2.2	3.2
 Hourglass	22.6	16.1

**Table 5** Breakfast habits

Breakfast		Frequencies %	
		Yes	No
		89.2	10.8
Location	Own home	81.7	
	Home of others	2.2	
	Cafè	3.2	
	Grab and go	2.2	
With whom?	Parent(s)	21.5	
	Parent(s) and sibling(s)	22.6	
	Sibling(s)	11.8	
	Family members (including pets)	5.4	
	Alone	22.6	
	Babysitter or other supporting figures	2.2	

Beginning with breakfast (Table 5), 89.2% of the respondents said they have it at home (81.7%) almost with one or both parents (21.5%), either parents or siblings (22.6%) or alone (22.6%). The grid with pictures (Fig. 5a) allowed children to reflect on the variety and quantity of foods and beverages available for their breakfast and possibly even add missing ones. The coding analysis shows that the majority drinks one cup of milk (59.1%) with cacao powder (12.9%) or a coffee drop (6.5%). Others (7.5%) prefer a vase of yogurt or a glass of juice/fruit smoothie (6.5%). Very few (4.3%) drink a cup of tea or carton tea (4.3%) or juice (2.2%). The majority (47.3%) prefers to accompany at least 2 cookies or cereals (12.9%), preservative snacks (7.5%) and croissants (7.5%).

On the home-school route (Fig. 6) 65.6% of participating children moved by car while 23.7% on foot. 4.3% arrived by riding a bike, 1.1% by non-riding and 5.4% added a scooter.

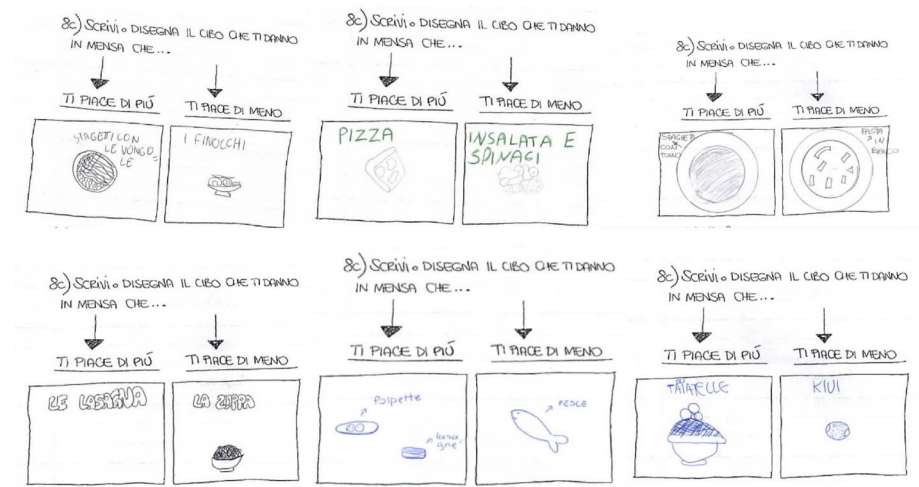
A second grid with food and beverage options (Fig. 5b) illustrated the mid-morning snack consumption at school, which was delivered by mothers (48.4%), by fathers (18.3%) or self placed in the backpack by children (19.4%). In 8.6% of cases, grandmothers or other family/own networks members delivered the snack while for only 1.1% was the school. The salty snack is the most distributed food item. Specifically: a packet of crackers (18.3%), a packet of italian salty biscuits called taralli or grissini (9.7%), sliced bread (8.6%) or a sandwich (4.3%) with cold cuts, a packet of chips (6.5%), a slice of pizza (3.2%), or italian flat bread speciality called piada or focaccia (2.2%). Among children who consumed a sweet mid-morning snack, we find preservative snacks (18.3%), at least 2 cookies (7.5%), a slice of homemade tart (5.4%), a muffin (3.2%), sweet bread (3.2%), a packet of wafers or a candy bar (3.2%). Some children eat nuts such as walnuts or almonds (2.2%) or seasonal fruits such as apples, bananas, oranges (12.1%) or carrots (1.1%). As beverage, at least one bottle of water is consumed by 61.3% of children alternated or supplemented by carton tea or juice (26.9%). At school, 92 out of 93 children participating in the study join the school canteen. This convivial moment is enjoyed by 68% children who appreciated at all (26%) or enough (66%) the food consumed. By looking at the canteens foods preferences: 27 were for pizza, 26 for lasagna and 11 for tagliatelle or spaghetti with sauce, tuna or clams, 10 for various types of seasoned pasta (pesto, tomato, meat sauce, tuna) and for passatelli a typical Emilia-Romagna pasta; the least liked are fish (20 mentions) and cooked vegetables such as broccoli, spinach, carrots, cauliflower, purple cabbage, savoy cabbage (19 mentions) followed by plain pasta (6 mentions) and salad, vegetable, barley soup (5 mentions each). In Fig. 9, some foods that are particularly liked (*Mi piace di più*) and disliked (*Mi piace di meno*). At home, children talk to their parents about what they ate at school with a frequency ranging from “sometimes” (50%) to “always” (40%). Only 10% affirm to never talk about it. Mothers (47.3%) are the main pillar for eating habits rules however 30.1% share this role with fathers.

The pursuit of physical well-being starts at school with the gym class, attended by all participating children (100%), and appreciated by 92%. And in family setting, 77.4% of these children have the opportunity to carry on a further sport: in team like soccer, basketball and volleyball (37.6%) or individual like artistic or rhythmic gymnastics (8.6%), classical, modern, hip-pop, aerial, or caribbean dance (6.5%), swimming (5.4%), martial arts like judo, karate kick boxing, brazilian jiu jitsu (3.2%), roller or skating (3.2%), sailing boat, vaulting with horse, biking, motorbiking and tennis (1.1% each). 4.3% play at least two of these sports.

### 3.3 Take home food and style message

61% of children emphasize that in their school programming have followed nutrition and lifestyles lessons. How much, then, have they learned and embodied, in their young lifecourse?

Table 6 outlines the daily distribution frequency in consuming at least one 0.5 cl bottle of water, fruits and vegetables intake, and soft drinks overconsumption. The majority (59.1%) drink at least one bottle of water and generally avoid excessive soft drinks consumption



**Fig. 9** Examples of most and least liked foods. In the drawing boxes to the reader’s left “ti piace di più = like the most”: Spaghetti pasta with clams; pizza; Spaghetti pasta with tuna; baked lasagna; meatballs and baked lasagna; tagliatelle pasta. In the drawing boxes to the reader’s right “ti piace di meno = like less”: fennels; salad and spinach; plain pasta; soup; fish; kiwi fruit

**Table 6** Daily consumption table: water, soft drinks, fruit, and vegetables

	Consumption of at least 1 water bottle	Excessive consumption of soft drinks	Fruit consumption	Vegetables consumption
	Frequencies %			
Yes	59.1	28	65.6	38.7
So-so	36.6	/	31.2	49.5
No	4.3	72	3.2	11.8
Total	100			

(72%). On fruits intake, 65.5% strongly agree, however, 61.3% (49.5% So-so and 11.8% No) struggle to consume vegetables.

A multiple-choice question containing foods combining both staples of the Italian Mediterranean diet and high-calorie, sugary foods (Table 7) calls children to rate the type of foods and beverages that should be consumed “often”; ‘little’ and “never” on a weekly scale. Among healthy foods such as fruits, vegetables and water, children show almost complete clarity: their assiduous consumption is necessary for at least 80%. Among unhealthy foods there is a correct awareness on the soft drinks contained consumption (59.1%) while on foods that should be consumed “little”, they give the right answer for bread (58%), pizza (74%) and ice cream (62%) (Table 7).

Organic food is part of the daily diet enjoyed in school canteens and encouraged through a series of workshop initiatives—at least in school—of the children participating in the study. And 84,9% correctly identified the wrong definition relating to organic farming (Table 8).

Through writing or drawing, then, children were asked to express their opinions on:

- the products to be included in a dream grocery shopping cart in line with their tastes

**Table 7** Awareness about food and beverage weekly consumption

	Frequency %			Total
	Often	A little	Never	
Bread	34.4	62.4	3.2	100
Pizza	7.5	79.6	12.9	
Meat	58.1	39.8	2.2	
Preservative snacks	11.8	57	31.2	
Rice	58.1	37.6	4.3	
Pasta	53.8	40.9	5.4	
Soft drinks	6.5	34.4	59.1	
Fruit	87.1	9.7	3.2	
Vegetables	88.2	9.7	2.2	
Water	95.7	9.7	/	
Cheese	34.4	51.6	14	
Fish	64.5	25.8	9.7	
French fries	8.6	54.8	36.6	
Ice cream	11.8	66.7	21.5	

**Table 8** “Intrusive” sentence identification

	Which of the following sentences is not appropriate for organic farming? <sup>a</sup>
	Frequency %
Correct answer	84.9%
Wrong answer	15.1%
Total	100

<sup>a</sup>Below are the response options: (a) it is good for the environment (b) it follows the rhythm of the seasons (c) it grows more nutritious fruits and vegetables (d) it uses harmful substances for the environment (e) the products are grown naturally. The (d) option is wrong

and desires;

- the products to be included in a grocery shopping cart for balanced and nutritious growth;
- a dinner to be prepared and served to their family members.

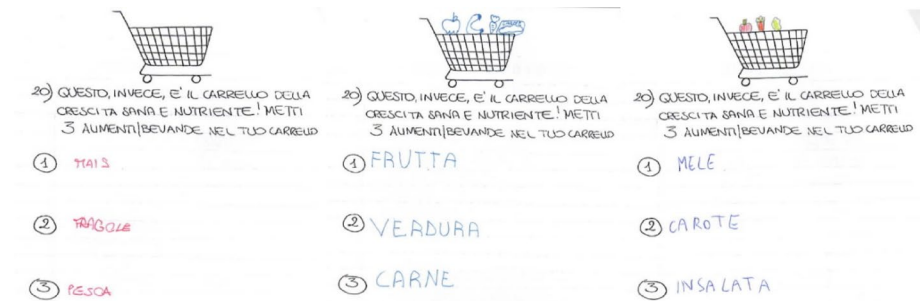
In the children’s dream grocery shopping cart, aggregating the textual and visual codes, we find soft drinks 39 times and, both fries and pasta 22 times. In the “balanced and nutritious” grocery shopping cart, the children mention 98 times vegetables, including beets, carrots, salad, broccoli, cucumbers, tomatoes, fennel, spinach, peas, peppers, avocados, 61 times fruits (orange, apple, pear, peach, cherries, banana, strawberries, tangerines) and 43 times water (Figs. 10, 11).

In the section *Tonight you are the chef! What do you cook?* among the most repeated suggestions are pizza, sushi, and rice cooked in different ways (Fig. 12). What is interesting to observe, however, is not the foods frequency but the type of the cooked dishes proposed. Following are some children proposal examples.

Moreover, by coding the cooked foods into healthy balanced and healthy imbalanced according to the CREA food chart (2018) and cross-referencing them with the question



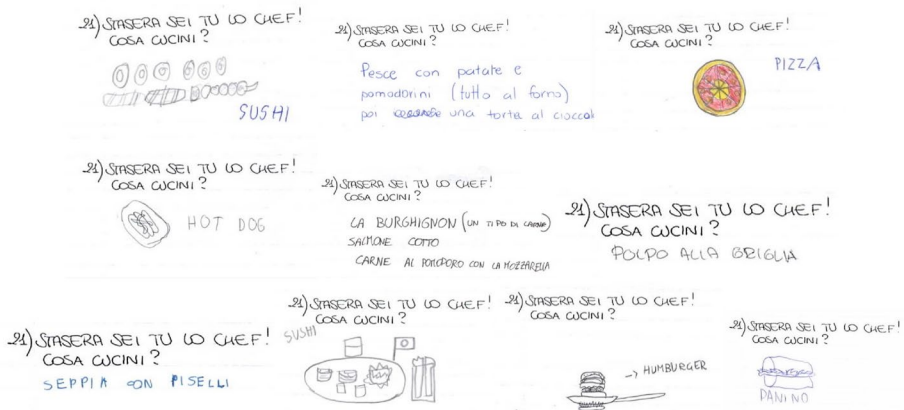
**Fig. 10** Example of children dream grocery shopping carts . In the shopping cart boxes, a list of children ideal foods and drinks that cannot be missed: (1) Pepsi cola; ice cream; tortellini pasta (2) sweets (packaged snacks; Nutella chocolate); biscuits; breadsticks and bread (3) pizza dough; tomato sauce; mozzarella cheese (4) peanut butter; coke; nutella chocolate



**Fig. 11** Example of children balanced and nutritious growth grocery shopping cart . In the children shopping cart boxes, a list of must-have foods and beverages for balanced and nutritious growth: (1) sweet corn; strawberries; peaches (2) fruit; vegetables; meat (3) apples; carrots; salad

“Can the food you cooked be usually eaten?” children appear to be aware that they deal with a healthy balanced (79.3% of cases) or healthy imbalanced (82.6% of cases) diet, and even when the proposal could be considered neither balanced nor imbalanced, their perception is distributed more toward a rigid judgment: “healthy imbalanced” for 65.9% and “healthy balanced” for 29.3%. So, even the children who drew imbalanced food were aware of the proposal offered.

Table 9, shows, then, the choice of activities carried out on the day prior to the pictorial questionnaire administration. 21.5% of the children played in the garden, park, or backyard while 38.7% chose a combination of both outdoor and indoor among the proposed activities. Aggregating the options 43.1% had outdoor practices, 18.3% indoor, and 38.7% both profiting the June days.



**Fig. 12** Compilation example of “Tonight you are the chef!—Stasera sei tu lo chef!”. In the drawings: (1) sushi (2) fish with potatoes and cherry tomatoes (all baked) and a chocolate cake (3) pizza (4) hot dog (5) bourguignonne (a type of meat), cooked salmon, tomato meat with mozzarella (6) grilled octopus (7) cuttlefish with peas (8) sushi (9) hamburger with bread (10) sandwich with salad and cold cuts

**Table 9** Activities carried out on the day before the study

	Fre- quen- cy %		% aggregate	Total
Going for a walk	6.5	Outdoor activities	43	100
Going for a run	5.4			
Riding a bike	2.2			
Playing outdoors (garden, park, backyard)	21.5			
Combination of going for a walk, a run, riding a bike, and/or playing outdoors	7.4			
Playing/watching screens (video games, tablets, smartphones, TV)	10.8	Indoor activities	18.3	
Watching tv	7.5			
Outdoor and indoor combination	38.7	Outdoor and indoor activities	38.7	

## 4 Discussion

In recent years, the experience of social research with children has been enriched by art based. Children agents are not only capable to set goals, reflections and actions but are also fully social to express themselves (Murray 2025; Favretto and Zaltron 2020). Consequently, the *enactment* of agency (Murray 2025; Giddens 1984) has implications also in educational settings to frame their knowledge, influence and make choices about how and what they learn to expand their capabilities. And, in participatory research, a quanti-creative method can further support the educational agency (Sevón et al. 2025).

Pictorial scales and emojis are commonly used for children's studies to explore subjective questions (Tang et al. 2024; Lewis-Dagnell 2023) or to capture specific subjective perceptions on social status (Galvan et al. 2023) with a reliable response rate (Massey 2022; Dudley et al. 2015; Reynolds et al. 2011). However, in social research, obtaining information from children through questionnaires presents unique challenges, even compared to adults. The validity of the data collected can be compromised by several factors that require special attention to research methodology. A first series of factors concern biographical barriers in language comprehension and in expressing exclusively by words, in resources and knowledge available in the course of interactions, psychological stress in sharing personal experiences orally and out loud in a one-to-one encounter or among other children or people and practical issues in the time-consuming of collecting data, in stimulating active engagement, in adult-child differential power, in building a safe and comfortable trust research setting, in verifying the answers provided (Sevón et al. 2025). A second series of factors concern the design of research instruments art-based related paying specifically attention on the construction of graphic elements, interpretative ambiguities, inclusion or exclusion criteria, and the potential aesthetic influence and attraction in the responses (Bosch and Revilla, 2021; Toepoel et al. 2019; Reynolds et al., 2011; 2009).

Therefore, conducting social research with children does not mean creating a simplified version of adults' instruments and procedures, but requires a specific methodological approach that considers their unique biographical, cognitive, and emotional characteristics to ensure the validity and reliability of the data collected. For these reasons, the creation of a pictorial questionnaire—developed within a pilot study among 4 classes of an Italian primary school—aimed at firstly, exploring how a quanti-creative approach can facilitate the children's agency and externalization of opinions and behaviors on everyday habits and bodily experiences; secondly at highlighting methodological and ethical advantages and limitations of using this type of approach and lastly, at observing potential further applicability of this approach to elicit information.

The quanti-creative approach described, offers the opportunity to aggregate data on subjective and objective questions to foster topical, methodological, and ethical reflections.

On a topical level a first clear outcome is the possibility of addressing a subject, potentially stigmatizing, such as satisfaction and body perceptions. The fairy-tale metaphor of the "mirror, mirror on the wall" (Ćwikła et al. 2023) has worked on the imagery of real and ideal aesthetics, one's own and others, which usually entails a range of possible vulnerabilities, fears, and comparisons. Body image is a subjective concept based on self-observation and on the lived environment. But misperception, above all, has important implications for healthy outcomes. The definition of real and ideal body image—developing over time and changes throughout life—is concerned about feeling good of the real compared to the desired appearance (Courtney and Chavez 2022). Understanding, then, a child's perception of body image is crucial for implementing prevention and treatment programs. It is interesting, then, to see how in this game of mirrors the questionnaire offered children the opportunity to confront themselves individually and to delve into aspects of their intimacy without necessarily having to share or express it out loud. From Collins's FRS emerges not so much that female and male children place their real image—as expected—between underweight or normal weight, but that children with overweight or obesity orient themselves—consciously—towards the underweight or normal weight values when they are asked to indicate the desirable image. Observing the others—one or both parents -, the deconstruction of the

silhouette into a geometric shape was the pretext for talking about bodies, without however offering a stigmatizing reading. In fact, criticism of others is increasingly revealed to be more and more ferocious, even when others are closer (Willis and Todorov 2006). In an educational research intervention, therefore, it was important to include a positive and neutral vision oriented towards the value of the uniqueness and variety of bodies. More than half of children perceive mothers and fathers as normal weight; almost 30%, overweight. Rectangle and hourglass are the most chosen shapes to represent these bodies. The consideration is no longer on the thin-fat dichotomy but on how harmonious is that body. The rectangle is the projection of a body with shoulders, waist, hips fairly aligned that create a straight silhouette while the hourglass denotes a thinner waist compared to shoulders and legs in which even the weight gain is not concentrated in a specific area. Consequently, this does not necessarily mean that all rectangle people are thin and the hourglass fat (Connell et al. 2006). Crossing the rating with shape scale, in fact, 71.9% of mothers and 69.6% of fathers of normal weight are assigned to a rectangle; for overweight mothers, 37.9% associate them with a rectangle and 27.6% with an hourglass; For overweight fathers, 50% are rectangular-shaped and 28.6% are hourglass-shaped.

Quanti-creative methods overcome body image research challenges by providing complementary perspectives: measurable data on body image and rich insights into individuals' feelings and perception, which are often missed by traditional surveys and objective measures. This mixed approach allows researchers to understand both the macro social influences and the micro personal meanings that shape body image, leading to more comprehensive and effective interventions (Bailey et al. 2021; Lovell and Banfield 2022).

Regarding eating and lifestyle habits, many among the children involved, seem to have an organized routine. Briefly, most of them have a good breakfast—mainly with a cup of milk and biscuits—at home with the family members; mothers have a key role in children's growth paying attention on the different aspects of food and lifestyles habits inside and outside their nucleus confirming the Southern Europe ideal—typical cultural model (Plava 2023). School with the canteen and educational activities is a valuable support. However, on the nutritional level, there is still work to be done within both family and school to increase the appreciation of highly nutritious foods such as fish, vegetables, and soups.

The take-home messages acquired in the short course of children's lives and already embodied in their daily routine highlight the importance of the work that is being carried out in the Rimini area. Children are aware of the distinction between healthy balanced and unbalanced foods, show a proactive attitude towards the consumption of foods and drinks considered nutritious for their growth, appear very meticulous in choosing the foods to serve as chefs, demonstrating skills that are already highly developed for their age, and prefer outdoor and active activities to indoor and sedentary ones.

Food consumption and leisure activities are closely linked to identity, incorporating individual and social attitudes (Simeone and Verneau, 2024; Plava 2023). The pictorial questionnaire, which emphasizes concrete and customizable scenarios and visual examples, allowing children's agency to unfold, reveals the full power of this identity.

On a methodological and ethical level, the outcome sheds lights on how in settings with large, low-literacy class groups, the use of scales and drawings speeds up the processing of questions, gives immediate insights and make the answering process a more pleasant experience. Furthermore, art-based learning in the classroom stimulates not only data mining but also a dialogic and reflective relationship. Classroom-based research with the pictorial

questionnaire has been totally focused on the even unexpected researcher-children dynamics. Therefore, it has been crucial that this type of intervention was structured by identifying and containing critical aspects (Zhan et al. 2024; Parsons et al. 2021; Phelan and Kinsella 2013). On this basis, while respecting the participant's agency and creativity, the researcher has navigated moments of tension by activating an appropriate and engaging learning experience and ensuring the integrity of the knowledge produced.

Findings indicate how quanti-creative method has (a) identified reliable information on children's eating habits and lifestyles by supporting children's agency and participatory discussion on living practices (b) offered visual stimuli and non-discriminating linguistic forms useful for investigating both subjective (opinion-based) and objective (behavior-based) questions (c) provided a methodological approach to analyze sensitive topics on large groups aim at gathering both individual and collective level data and at overcoming literacy, biographical, emotional, and cultural barriers, stressors factors with a broaden utility beyond the childhood.

## 5 Conclusions

This work offers a novel integration to support children-centred research in a community educational setting and contribute to the growing body of literature on quantitative art-based research by focusing on its ethical, methodological, and epistemological dimensions. This approach has proven to be a solid basis on which to set up classroom research and a teaching intervention that promotes active participation, overcoming unpredictability in children's management.

The children engagement on eating and lifestyles habits, and on body perception has stimulated reflection on deep-rooted experiences with a positive influence on the educational path with (1) the direct engaging on lived topics (2) the action stimulus to improve awareness on health issues.

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## Declarations

**Conflicts of interest** The author declares no conflicts of interest.

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## References

- Bailey, K.A., Dagenais, M., Gammage, K.L.: Is a picture worth a thousand words? Using photo-elicitation to study body image in middle-to-older age women with and without multiple sclerosis. *Qual. Health Res.* **31**(8), 1542–1554 (2021)
- Bosch, O.J., Revilla, M.: Using emojis in mobile web surveys for millennials? A study in Spain and Mexico. *Qual. Quant.* **55**(1), 39–61 (2021)
- Brecic, R., Gorton, M., Cvencek, D.: Development of children’s implicit and explicit attitudes toward healthy food: personal and environmental factors. *Appetite* **176**, 106094 (2022)
- Brenner, P.S.: Narratives of response error from cognitive interviews of survey questions about normative behavior. *Sociol. Methods Res.* **46**(3), 540–564 (2017)
- Bussu, S., Lalani, M., Pattison, S., Marshall, M.: Engaging with care: ethical issues in participatory research. *Qual. Res.* **21**(5), 667–685 (2021)
- Canoni, E. 2024. Il disegno dei bambini. Carocci.
- Cardel, M.I., Tong, S., Pavela, G., et al.: Youth subjective social status (SSS) is associated with parent SSS, income, and food insecurity but not weight loss among low-income Hispanic youth. *Obesity* **26**(12), 1923–1930 (2018)
- Cecil, C.A.M., McCrory, E.J., Viding, B., et al.: Initial validation of a brief pictorial measure of caregiver aggression: the family aggression screening tool. *Assessment* **23**, 307–320 (2015)
- Centro di ricerca alimenti e nutrizione—CREA (2018). Linee guida per una sana alimentazione. Available from: <https://www.crea.gov.it/web/alimenti-e-nutrizione/-/linee-guida-per-una-sana-alimentazione-2018>
- Chambers, C.T., Craig, K.D.: An intrusive impact of anchors in children’s faces pain scales. *Pain* **78**, 27–37 (1998)
- Chan, M.J., Tay, G.W.N., Kembhavi, G., et al.: Understanding children’s perspectives of the influences on their dietary behaviours. *Public Health Nutr.* **25**(8), 2156–2166 (2022)
- Collins, M.E.: Promoting healthy body image through the comprehensive school health program. *J. Health Educ.* **22**(5), 297–302 (1991)
- Connell, L.J., Ulrich, P.V., Brannon, E.L., et al.: Connell body shape assessment scale: instrument development for analyzing female figures. *Cloth. Text. Res. J.* **24**, 80–95 (2006)
- Courtney, M., Chavez, J.B.: What is the relationship among actual body image, desired body image, and body mass index in 7–12-year-old children? *J. Family Med. Prim. Care* **6**, 174 (2022)
- Ćwikła, M., Konior, A., Laberschek, M., et al.: Mirror, mirror on the wall, do I want to know at all? A story about cultural organizations that conduct research on themselves and those that do not. *Int. J. Cult. Policy* **29**(4), 518–536 (2023)
- Dudley, D.A., Cotton, W.G., Peralta, L.R.: Teaching approaches and strategies that promote healthy eating in primary school children: a systematic review and meta-analysis. *Int. J. Behav. Nutr. Phys. Act.* **12**, 28 (2015)
- Favretto, A. R., and Zaltron, F.: “Adjusting life to illness or illness to life? Reflections on children’s competences in the neoliberal era”. In: *Health and Illness in the Neoliberal Era in Europe*, 107–121. Emerald (2020)
- Galvan, M.J., Payne, B.K., Hannay, J., Georgeson, A.R., Muscatell, K.A.: What does the MacArthur scale of subjective social status measure? Separating economic circumstances and social status to predict health. *Ann. Behav. Med.* **57**(11), 929–941 (2023)
- Ghiassi, R., Murphy, K., Cummin, A.R., Partridge, M.R.: Developing a pictorial Epworth sleepiness scale. *Thorax* **66**(2), 97–100 (2011)
- Giddens, A.: *The constitution of society: outline of the theory of structuration*. Polity Press, Cambridge (1984)
- Graham, A., Powell, M.A., Taylor, N.: Ethical research involving children: encouraging reflexive engagement in research with children and young people. *Child. Soc.* **29**(5), 331–343 (2015)
- Hall, L., Hume, C., and Tazzyman, S.: “Five degrees of happiness: Effective smiley face likert scales for evaluating with children”. In: *Proceedings of the the 15th international conference on interaction design and children*, 311–321 (2016)
- Lewis-Dagnell, S.A.C., Parsons, S., Kovshoff, H.: Creative methods developed to facilitate the voices of children and young people with complex needs about their education: a systematic review and conceptual analysis of voice. *Educ. Res. Rev.* (2023). <https://doi.org/10.1016/j.edurev.2023.100529>
- Lovell, H., Banfield, J.: Implicit influence on body image: methodological innovation for research into embodied experience. *Qual. Res.* **22**(1), 40–55 (2022)
- Maćkiewicz, M., Ciecuch, J.: Pictorial personality traits questionnaire for children (PPTQ-C)—a new measure of children’s personality traits. *Front. Psychol.* **7**, 498 (2016)

- Markham, A. N.: Qualitative research is... Available from: <https://annetmarkham.com/2020/03/qual-research/> (2020)
- Massey, S.: Using emojis and drawings in surveys to measure children's attitudes to mathematics. *Int. J. Soc. Res. Methodol.* **25**(6), 877–889 (2022)
- McDonnell, T.E.: Drawing out culture: productive methods to measure cognition and resonance. *Theory Soc.* **43**(3), 247–274 (2014)
- Montreuil, M., Carnevale, F.A.: A concept analysis of children's agency within the health literature. *J. Child Health Care* **20**(4), 503–511 (2016)
- Montreuil, M., Bogossian, A., Laberge-Perrault, E., Racine, E.: A review of approaches, strategies and ethical considerations in participatory research with children. *Int J Qual Methods* **20**, 1609406920987962 (2021)
- Morera-Castro, M., Jiménez-Díaz, J., Araya-Vargas, G., Herrera-González, E.: Pictorial children's physical activity questionnaire: design and validation. *Actual. Investig. Educ.* **18**(2), 55–83 (2018)
- Moss, R.H., Kelly, B., Bird, P.K., Pickett, K.E.: Examining individual social status using the MacArthur scale of subjective social status: findings from the Born in Bradford study. *SSM-Population Health* **23**, 101463 (2023)
- Murray, J.: Young children's agency. *Int. J. Early Years Educ.* **33**(2), 237–243 (2025)
- Nalam, A., Gavaravarapu, S.M., Kodali, V., Dharmapuri, R.R.: Pictorial learning and visual imagery-based activity methods in nutrition education for primary schoolchildren in India. *J. Nutr. Educ. Behav.* **49**(3), 264–267 (2017)
- Parsons, E., Kearney, T., Surman, E., et al.: Who really cares? Introducing an 'Ethics of Care' to debates on transformative value co-creation. *J. Bus. Res.* **122**, 794–804 (2021)
- Phelan, S.K., Kinsella, E.A.: Picture this... safety, dignity, and voice—ethical research with children: practical considerations for the reflexive researcher. *Qual. Inq.* **19**(2), 81–90 (2013)
- Plava, A.: Il peso dell'infanzia: Una ricerca sociologica su abitudini alimentari e obesità. FrancoAngeli (2023).
- Reynolds, L., Johnson, R., Dickenson, T., McFadden, L.: Validity and reliability in visual Likert scales. *Stud. Learn. Eval. Innov. Dev.* **6**(3), 15–24 (2009)
- Reynolds, L., and Johnson, R.: Is a picture worth a thousand words? Creating effective questionnaires with pictures. *Pract. Assessment Res. Evaluat.* **16**(8) (2011)
- Sevon, E., Mustola, M., Siipainen, A., Vlasov, J.: Participatory research methods with young children: a systematic literature review. *Educ. Rev.* **77**(3), 1000–1018 (2025)
- Simeone, M., Verneau, F.: In support of framing Food Identity towards pro-environmental food choices through empirical evidence. *Qual Quant.* <https://doi.org/10.1007/s11135-023-01826-11-12> (2024)
- Stahl, G.: Relationship-building in research: Gendered identity construction in researcher-participant interaction. In: *Gender identity and research relationships*, 145–165. Emerald (2016)
- Stunkard, A.J., Sørensen, T., Schulzinger, F.: Use of the Danish adoption register for the study of obesity and thinness. *Res. Publ. Assoc. Res. Nerv. Ment. Dis.* **60**, 115–120 (1983)
- Tang, T.C.W., Wong, M., Li, J.B., Chan, D.K.C.: Pictures versus words: can we use a pictorial scale to measure child health-related quality of life? *Front. Public Health* **12**, 1398944 (2024)
- Toepoel, V., Vermeeren, B., Metin, B.: Smiley, stars, hearts, buttons, tiles or grids: influence of response format on substantive response, questionnaire experience and response time. *Bull. Sociol. Methodol.* **142**(1), 57–74 (2019)
- Tourangeau, R., Rips, L.J., and Rasinski, K.: The Role of memory in survey responding. *Psychol. Surv. Response.* 62–99 (2000a)
- Tourangeau, R., Rips, L.J., and Rasinski, K.: answering questions about dates and durations. *Psychol. Surv. Response* 100–135 (2000b)
- Tourangeau, R., Rips, L.J., and Rasinski, K.: Selecting a Response: Mapping Judgments to Survey Answers. *Psychol. Surv. Response.* 230–254 (2000c)
- Tourangeau, R., Rips, L.J., and Rasinski, K.: Mode of data collection. *Psychol. Surv. Response.* 289–312 (2000d)
- Vaisey, S.: Motivation and justification: a dual-process model of culture in action. *Am. J. Sociol.* **114**(6), 1675–1715 (2009)
- Ward, M.R.: The importance of gender reflexivity in the research process. In: *Gender identity and research relationships*, ix–xvi. Emerald (2016)
- Willis, J., Todorov, A.: First impressions: making up your mind after a 100-ms exposure to a face. *Psychol. Sci.* **17**(7), 592–598 (2006)
- World Health Organization—WHO. Mapping the health system response to childhood obesity in the WHO European Region. An overview and country perspectives. Available from: [www.euro.who.int/\\_\\_data/assets/pdf\\_file/0019/401176/Childhood-obesity-web.pdf](http://www.euro.who.int/__data/assets/pdf_file/0019/401176/Childhood-obesity-web.pdf) (2019)

- Zhan, Y., Sun, D., Kong, H.M., Zeng, Y.: Primary school teachers' classroom-based e-assessment practices: insights from the theory of planned behaviour. *Br. J. Educ. Technol.* **55**(6), 2740–2759 (2024)
- Zhang, J.J., Smith, D.W., Lam, E.T.C., et al.: Development of an evaluation scale to measure participant perceptions of after-school enrichment programs. *Meas. Phys. Educ. Exerc. Sci.* **6**, 167–186 (2002)

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