Developing an Evaluation Grid for the “Drawn Stories Technique”: Exploring the Indicators of Children’s Socio-Emotional Development, Anxiety, and Depression Levels

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CRediT authorship contribution statement

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Abstract

Introduction Since the first development of psychology, drawing has been considered a useful tool to understand an individual's development and personality. The graphic method has been regarded as a valuable means of expressing not only personality traits but also a child's emotions and the emotional tone they "invest" in the surrounding environment. However, empirical evaluations have raised substantial doubts about the reliability and validity of this kind of technique, and the lack of studies that provide empirical scoring methods represents a significant limitation in the field. This study aims to develop a tailored evaluation grid for the Drawn Stories Technique to explore which drawing indicators-story outcomes, themes, content, and formal aspects might reflect children's socio-emotional functioning in terms of emotional and social intelligence, as well as clinical levels of anxiety and depression.

Method. The Drawn Stories Technique along with four self-report questionnaires assessing trait Emotional Intelligence, Social Intelligence, Anxiety, and Depression, were administered to 228 primary school children in groups during class time.

Results. Negative outcomes were positively related to depression scores but not to anxiety scores, while social skills were associated with fewer death-related themes. Children that exhibited clinical levels of depression tended to draw significantly fewer themes related to fables and animals, and more everyday life events. Conversely, children with clinical levels of anxiety showed differences in some formal aspects in their drawings, including fewer empty spaces and more heavy line traits.

Conclusion. This study has shown the potential use of graphic techniques with primary school children to obtain potential indicators of maladjustment through an evaluation grid to collect information.

Keywords: Performance based test; Drawings; Emotional Intelligence; Anxiety; Depression; Primary School

Introduction

Since the first development of psychology, drawing has been considered a useful tool to understand an individual's development in terms of emotional experiences and personality (Driessnack, 2005). Evaluating an individual's emotional experience can be complex and sometimes challenging,

particularly in children and adolescents, due to their brain plasticity, developing minds, and the influence of numerous factors (e.g., biological, environmental) that may affect their subjective experience. Children and adolescents may struggle in explaining their internal experience in terms of emotions and feelings. Current evidence shows that children can often express emotions through drawings, even when they are unable to communicate or express them verbally (Fury et al., 1997; Malchiodi, 1998; Kim and Suh, 2013; Pace et al., 2013). Some others have also suggested that, through their drawings, children can create connections that reveal their mental internal world (Cox, 2013). For these reasons, drawing could be the best way for children to communicate their feelings, conflicts, and mental states, and it is halfway between acting and dreaming (Cox, 2013). Moreover, through drawing, children can convey the affective tone with which they "invest" in the world around them (Longobardi et al., 2017). Children's drawings can depict particular events from their lives, aspects of their experiences that they consider significant, and what they have noticed, remembered, and considered important at the time of drawing. In other words, drawing allows children to express emotions and meaningful experiences that they have not yet categorized or verbalized (Søndergaard & Reventlow, 2019).

According to that, in the clinical context, two of the most frequently used drawing techniques are the Draw-a-Person Test and the Family Drawing Test (Goodenough, 1926; Machover, 1953; Hammer, 1958; Harris, 1963; Corman, 1967), both widely employed in a psychodiagnostic assessment (Skybo et al., 2007). In this regard, surveys among clinicians have shown that, particularly in the Italian context, these two techniques are among the most commonly used tools for developmental assessment, ranking within the top five most frequently employed instruments and demonstrating a high level of trust comparable to more structured tools (Tressoldi et al., 2010). Internationally, similar trends have been observed. For instance, Mihura, Roy, and Graceffo (2017) found that figure-drawing techniques continue to be taught in 28% of psychology training programs overall and in 62% of practitioner-focused programs, suggesting their enduring relevance in clinical practice despite longstanding debates regarding their empirical foundations. Particularly, the Draw-a-Person Test enables the clinician to capture the child's perception of their self and to release their private fantasies and anxieties (Machover, 1953), and the perception helps to understand children's representations of their parents (McGuigan and Pratt, 2001; Piperno et al., 2007).

However, in exploring the utility of drawings within clinical settings, it is important to distinguish between their use as tools for enhancing therapeutic communication and their effectiveness as diagnostic aids. As mentioned above, projective drawing techniques, such as the Draw-A-Person Test (DAP), have been used for their supposed ability to unveil the underlying psychodynamics of the individual, particularly in children. This belief stems from early psychoanalytic theories which posited that individuals project their internal world onto their drawings, thereby providing insights into their unconscious (Machover, 1949). However, empirical evaluations have raised substantial doubts about the reliability and validity of such interpretations. For example, Swensen (1957) critically reviewed studies from 1945 to 1956, concluding that the hypotheses concerning personality projections in figure drawings lacked empirical support. This skepticism was echoed by Motta, Little, and Tobin (1993), who argued that despite their widespread use, human figure drawings (HFDs) do not reliably assess personality, behavior, emotion, or intellectual functioning. They pointed out that the continued use of HFDs could be attributed more to their simplicity and anecdotal successes rather than robust empirical evidence. This calls for a cautious application of these methods, possibly integrating them with other validate tools in a multi-method assessment. Moreover, literature with these techniques focused mainly on the formal aspects of a drawing (e.g., omissions, shading, heavy stroke, and erasures), while using a combination of both graphic and narrative elements could allow for a richer and more comprehensive understanding of the child's inner world. This multiple focus on drawing, narrative, and imagery provides additional layers of information that may not be captured by techniques that rely solely on scoring the formal content of drawings. This integration of narrative themes and drawing elements in a graphic-narrative technique, such as the Drawn Stories Technique discussed below, could bridge gaps in previous approaches and address some of the critiques historically associated with this kind of method.

The Drawn Stories Technique

Beyond the more famous DAP test, an example of a graphic technique that is based on both free drawings and narration is the Drawn Stories Technique (Trombini, 1994), which was developed originally in a psychoanalytic and psychodiagnostic context to facilitate not only empathic communication and narrations with patients but also the evaluation, detection, and interpretation of

psychological suffering in developmental age. This technique permits the expression of free drawing in a sequence of scenes and encourages the construction of many possible narrative developments. The conclusions from these narrations can be evaluated according to well-defined categories, such as the story's outcome, which expresses children's emotional distress levels (Trombini et al., 2004). The psychologist asks a child to draw an invented story, without insisting on any point of view and waiting for the child to draw the story. Through this technique, children can express their affective themes and internal conflicts. These stories can be classified depending on how the story ends: (1) Positive Outcome (PO): the subject ends his narration positively without any accident (Figure 1); (2) Negative Outcome (NO): the subject ends their narration negatively with an accident (Figure 2); (3) Compensated Positive Outcome (CPO): it signed when the story, despite the presence of an accident, ends positively (Figure 3); (4) Absent Outcome (AO): the story is not completed. The Drawn Stories Technique combines graphic production with narrative elements, and it is different from other graphic methods, such as DAP, where children are asked to draw first and then narrate; this technique requires children to simultaneously imagine and illustrate a story. This process naturally integrates imaginative and cognitive components with the act of drawing, facilitated by dividing the paper into four quadrants to enhance narrative continuity. To date, this technique was used only in two studies on Italian samples. The first study by Trombini and colleagues (2004), involved a sample of 211 primary and secondary school children and demonstrated the technique's validity in detecting children's emotional distress through negative stories outcomes. The second study was conducted with a sample of 1,700 primary and secondary school children, and found significant sex and age differences in the Drawn Stories Technique outcomes (La Grutta et al., 2023). Specifically, boys tend to draw a greater number of negative outcomes than girls, and this tendency was stronger for primary than secondary school children, possibly due to differences in many of the emotional expressions (internalizing vs externalizing expressions) between boys and girls (La Grutta et al., 2023). Moreover, the authors suggest that the outcomes of children's stories should not be considered merely as nominal variables but rather as an ordinal scale, reflecting the developmental progression of their narrative complexity. Specifically, younger children tend to create simpler stories with predominantly positive outcomes, whereas older children and pre-adolescents demonstrate a growing capacity to construct more complex narratives, often resulting in compensated positive

outcomes. These compensated positive outcomes are thus considered more advanced, as they indicate a higher level of cognitive and emotional maturity, allowing the child to integrate difficulties within the story but still arrive at a positive resolution (La Grutta et al., 2023).

On the other hand, even if rare, the absence of an outcome could be scored as the lowest value, as it is often associated with difficulties in narrative processing and a blockage in symbolic expression. Interestingly, while negative outcomes may indicate emotional distress, they are not interpreted as negative signs themselves because, they can serve as a way for children to express and represent their inner struggles, thereby allowing them to communicate their emotional state somewhat symbolically. For all these reasons, they recommended using the drawing technique to facilitate dialogue with children, modulate educational materials, and identify and prevent issues affecting group dynamics within the classroom context. However, these findings focused only on the outcomes of the stories, overlooking other important information that drawings and children could provide about the narrative.

The Present Study

Although largely used in clinical settings, the use of graphic techniques in research is currently debated. There is a large discrepancy between their use in clinical and research settings (Lilienfeld et al., 2000), questioning the limited psychometric characteristics related to the potential subjective interpretation of the responses by clinicians and researchers.

For these reasons, self-reported measures are often preferred in research because they show better psychometric qualities in terms of reliability and validity, but, conversely, are based on the will of the response reflecting rational thinking and consciousness (Comuniani et al., 2002; Kennedy et al., 2017). These aspects, especially in the developmental age, could hinder having access to unconscious thoughts and feelings that could be fundamental to expanding knowledge about complex intrapsychic phenomena of children's mental functioning. According to that, some authors proposed to evaluate a comprehensive approach both in clinical and research settings integrating questionnaires, objective tests, and projective techniques to have a more complex scenario of individual mental functioning (Comuniani et al., 2002).

Recognizing these concerns, our study aims to refine these methods by developing a specific evaluation grid for the Drawn Stories Technique (Trombini, 1994), incorporating both narrative and graphic elements. This technique improves traditional methods by providing a structured framework that

allows more consistent and interpretable outcomes. By focusing on story outcomes, themes, emotional contents, and formal aspects of drawings, we propose a comprehensive approach that integrates qualitative insights with quantitative aspects. This framework enables us to explore the association between these elements and children's socio-emotional functioning in terms of emotional intelligence, social intelligence, and clinical levels of anxiety and depression, as measured with self-report questionnaires.

Method

Participants and Procedures

The present study has a cross-sectional design involving 228 children aged 8-11 years (115 females; Mean age = 9.57; SD = .62) from three primary schools located in Italy. Power analysis was performed with G* Power 3.1 Software in order to determine the minimum total sample size required for this study, and the results showed that at least 129 participants were needed to the purposes of our study. Participants were recruited upon regular permission from each school's principals and after the completion of informed consent by parents. Data collection was carried out in groups in classroom during regular class-time, and lasted about 60 minutes.

In addition to a group of self-report measures, the Drawn Stories Technique was administered to children and evaluated by two independent raters using an ad hoc evaluation grid. The grid is divided into four categories: outcomes, narration themes, emotional contents, formal contents to systematically collect information about each story (Table 1). Inter-rater agreement coefficients (Cohen's Kappa) for each category are also presented in the evaluation grid in Table 1 and in cases where discrepancies arose between raters during the coding process, these were resolved through consensus. Raters independently rated all protocols and discussed the differing interpretations until an agreement was reached, ensuring consistency and reliability in the evaluation process. The Drawn Stories Technique was presented first, and the instructions were the follows: "*Now we're giving you a sheet of paper divided into four sections. Your task is to draw a story, and you're free to choose any theme you like. The only rule is that the story should begin in the first section, continue through the second and third, and conclude in the fourth. Once you're finished, you can write the story on the back of the sheet and then explain to us what you've*

drawn". After the children completed their drawings, the researcher asked individually a few standard questions about the story such as: "*Who are the characters?*" "*If you had to pick one character that resembles you, who would you pick?" "How does this character feel?"* and *"How does the story end?".*

Once all the children in the classroom had finished telling their stories, the other questionnaires were presented. The study was conducted in accordance with the Declaration of Helsinki and was approved by the Bioethics Committee of the first author institution (Prot. n. 322763/2021).

Table 1.

The ad hoc evaluation grid for the Drawn Stories Technique and inter-rater reliability coefficients

	CODE		Frequencies (%)	Cohen's Kappa
	SCHOOL			
	CLASS	1 A		
OUTCOMES EVALUATION Median Kappa=.75	OUTCOMES	0/1/2/-1		.75
	NEGATIVE OUTCOME	0/1	15.8	1.00
	POSITIVE OUTCOME	0/1	42.5	.55
	COMPENSATED POSITIVE OUTCOME	0/1	41.7	.56
	ABSENT OUTCOME	0/1	0.3	1.00
NARRATIVE THEMES Median Kappa=.65	FILM/TV SERIES	0/1	8.4	.65
	FABLES	0/1	57.0	.63
	VIDEOGAMES	0/1	5.0	
	EVERYDAY LIFE ASPECTS	0/1	38.0	.84
	PERSONAL EXPERIENCES	0/1	16.2	1.00
	SPORT	0/1	8.4	1.00
	SCHOOL	0/1	5.4	1.00
	POSITIVE RELATIONSHIP WITH PARENTS	0/1	4.0	.50
	NEGATIVE RELATIONSHIP WITH PARENTS	0/1	4.2	.65
	ANIMALS	0/1	21.0	.56
	POSITIVE RELATIONSHIP WITH PEERS	0/1	21.6	.65
	NEGATIVE RELATIONSHIP WITH PEERS	0/1	6.0	.69
	GROWTH/ TRANSFORMATIONS	0/1	19.2	.60
	PHYSICAL DISEASES	0/1	12.2	.43
	DEATH	0/1	11.4	.78
	FIGHT/CONFLICT	0/1	28.0	.56
EMOTIONAL CONTENTS Median Kappa=.51	HAPPINESS	0/1	11.8	.80
	GOODNESS	0/1	39.4	.20
	AFFILIATION	0/1	13.5	.51
	ALTRUISM	0/1	16.8	.60
	BOREDOM	0/1	1.2	.20
	GUILT	0/1	3.0	.25
	SADNESS	0/1	13.5	.67

	ABANDON	0/1	8.8	.23
	ANGER	0/1	2.0	.32
	HOSTILITY	0/1	35.5	.55
	FEAR	0/1	11.4	.51
	ANXIETY	0/1	7.0	.28
	NO EMOTIONAL CONTENTS	0/1	7.2	.20
FORMAL ASPECTS Median Kappa=.56	EMPTY SPACES	0/1	37.7	.58
	BROKEN LINES	0/1	70.6	.51
	CURVE LINES	0/1	29.3	.42
	SHADOWS	0/1	3.0	.21
	ERASURES	0/1	14.0	.43
	LIGHT STROKE	0/1	43.2	.80
	HEAVY STROKE	0/1	54.8	.83
	BIG DIMENSIONS	0/1	9.0	.25
	SMALL DIMENSIONS	0/1	8.3	.24
	BLACK	0/1	52.7	.70
	RED	0/1	2.4	.82
	MORE COLORS	0/1	47.3	.91
	DETAILED CHARACTERS	0/1	63.1	.56
	DETAILED BACKGROUNDS	0/1	47.9	.48
	POKER FACE	0/1	16.2	.79
	MISSING BODY PARTS	0/1	57.0	.45
	HUMAN CHARACTERS	0/1	82.8	
	BALOONS	0/1	58.1	.78
	SPROPORTIONS	0/1	9.0	.22

Measures

The Drawn Stories Technique

To evaluate the emotional state of children, the Drawn Stories Technique (Trombini, 1994) was used. With the brief interview about children's stories presented above, it was possible to determine which character the child identifies with and to score the type of outcome based on what happens to the chosen character. The narration of the story was evaluated following the categories in the evaluation grid (see Table 1).

Ad hoc evaluation grid for the Drawn Stories Technique

An ad hoc evaluation grid for the Drawn Stories Technique was developed for this study to categorize the information provided by children through their stories (Table 1). The grid was inspired by the scoring scheme by Reuben Fine (1955) originally developed for the scoring of TAT and other verbal projective techniques. The Drawn Stories Technique can be considered as both a productive- graphic

and verbal projective technique. For this reason, the ad-hoc evaluation grid includes components that assess the narrative contents as well as the characteristics of the drawings. Specifically, the grid is divided into four main sections: narration themes, emotional contents, formal characteristics, and story outcomes.

The first section collects the central themes of the narration, reflecting explicit references to categories such as: films/TV series; fables; videogames; everyday life aspects; personal experiences; sport; school; negative relationship with parents (parents-), positive relationship with parents, animals, positive relationship with peers, negative relationship with peers, growth and changes, physical diseases, death, fight. The second section focuses on emotional/relational contents, assessing the emotions and relational aspects of the character children identify with. These are categorized as: happiness, goodness, affiliation, altruism, boredom, guilt, frustration, sadness, anger, hostility, fear, anxiety, no emotional contents. The third section examines the formal characteristics of the drawings, categorized as follows: empty spaces (the drawing shows empty spaces), broken lines (the drawing is characterized by fragmented lines), curve lines, shadows (shading and blackening in the drawing), erasures (some part of the drawing were erased and sometimes redrawn), light stroke (the drawing is characterized by light, faint, or thin lines), heavy stroke (the drawing shows heavy, strong, or thick lines), black (black is the primary color used), red (red is the primary color used), color variety (a wide range of colors used), detailed characters (from the analysis of the details of the characters represented in the drawing traces their presence), detailed background (the background is depicted with significant details), inanimate details (the drawing presents inanimate objects), poker face (characters display an expressionless face), missing or disproportionate body parts (from the analysis of the characteristics of body parts of the animated subjects of the drawing, they are missing or, if present, disproportionate), presence of humans (the drawing presents human beings), balloons (the drawing presents cartoons and/ or written texts), disproportion of the characters (the drawing presents a size disproportion between the characters), predominance inanimate elements (the drawing presents inanimate aspects which outweigh animated ones), essential elements of the face missing/disproportionate (essential facial features are absent or disproportioned).

Regarding the evaluation of the drawings, the four quadrants together compose a single story and are assessed as such, including the various categories in our grid. Specifically, for each story, a row in

the analysis table is obtained, which is completed with a dichotomous evaluation: assigning a value of zero (0) when the corresponding indicator is absent and one (1) when it is found; the only exception is represented by the column Outcomes that provides four possible values depending on the type of corresponding outcome: 0 for Negative Outcomes, 1 for Positive Outcomes, 2 for Positive Outcomes Compensated and -1 for Absence of Outcomes.

Trait Emotional Intelligence

The Trait Emotional Intelligence Questionnaire Child Short Form (TEIQue-CSF; Mavroveli, Petrides, Shove, & Whitehead, 2008) in its validated Italian version (Russo et al., 2012) was employed for trait EI. It is a self-report measure that comprises 36 items responded to on a 5-point scale and provided a global trait EI score. In this study, this questionnaire has shown good reliability (Cronbach alpha = .85)

Social Intelligence

A modified and simplified version of the Italian form of the Tromsø Social Intelligence Scale (TSIS; Gini & Iotti, 2008) was used to assess SI. The original scale is composed of 21 items rated on a 7-point self-report scale which evaluates a series of abilities related to SI and is divided into three different subscales: Social Information Processing (SP), Social Skills (SS), and Social Awareness (SA). The version we used was simplified in the item's syntax to make them more understandable to children, and the response scale was changed from 7 to 5 points (from “Describes me extremely poorly” to “Describes me extremely well”). The reliability of two subscales was acceptable: Social Information Processing (Cronbach alpha = .74); and Social Skills (Cronbach alpha = .76); while Social Awareness internal reliability was sufficient (Cronbach alpha = .60).

Anxiety

The Italian version of the Anxiety Scale Questionnaire for Children (Busnelli, Dell’Aglio, Faina, 1974) was used to assess anxiety symptoms. It is a self-report scale that provides three scores: general anxiety, scholastic anxiety, and total anxiety. To assess the risk of anxiety, scores were categorized into two levels (non-clinical and clinical) based on the severity of symptoms. To achieve this, the scores were placed into percentiles according to the validated data provided in the manuals (<74 = non-clinical, and >75 = clinical). For the purposes of this study, only the total anxiety score was evaluated. All the scales

of this study showed good reliability (Cronbach alpha = .85).

Depression

The Italian version (Camuffo, Cerutti, Lucarelli, & Mayer, 1988) of the Children Depression Inventory (CDI; Kovacs, 1988) was used to assess depression levels. It is a 27 Likert-like items self-report scale, with scores severity ranging from 0 (absence of symptoms) to 2 (definite symptom), and yields total scores from 0 to 54, with higher scores reflecting greater symptomatology. Specifically, to evaluate depression levels, the cut-off of 19 was used according to the Italian norms (Kovacs, 1992), namely, scores < 19 indicate non-clinical risk of depression, while scores > 19 indicate clinically significant levels of depression. The reliability of the CDI was good (Cronbach alpha= .86).

Statistical analysis

Statistical analyses were performed using programs in the Statistical Package for Social Sciences (SPSS for Windows release 25.0). According to the principle of absence/presence, the outcomes of the story were treated as dichotomous variables as follows: NO=0-1(absence-presence), PO=0-1(absence presence) PCO=0-1(absence-presence), and also the elements in the other section of the evaluation grid was treated as well (absence=0; presence=1). Bivariate statistics such as Pearson *r* were used to explore the relationship between variables, while univariate analysis of variance (ANOVA) and Chi-square test were conducted to explore sex differences and differences between children who show clinical and non-clinical anxiety and depression. Given the high number of correlations and comparisons, the Benjamini-Hochberg correction procedure was applied to minimize the probability of Type I and Type II errors. To ensure statistical stability and reliability, only variables with a frequency greater than 10% in the sample were included in the analyses. Categories with low frequencies were excluded due to their limited interpretability within the current dataset. Additionally, for the formal aspects of the drawings, mutually exclusive variables (e.g., 'Heavy Stroke' vs. 'Light Stroke') were analyzed separately, with the most representative variables selected to reduce redundancy and focus the analyses. Despite these exclusions, the Benjamini-Hochberg correction was applied to the full set of variables initially considered to control for the false discovery rate across multiple comparisons.

Results

Descriptive and frequency distributions in the sample

As regards the information from the evaluation grid, only categories that were reported at least by 10% of the sample were included in the analysis and the differences in distribution for sex through Chi-Square were reported in Table 1. Specifically, regarding the outcomes of the drawn stories technique most children produced Positive Outcomes (n=97, 42.5%) and Positive Compensated Outcomes (n=95, 41.7%) while 15.8% (n=36) produced Negative Outcomes. The most frequent themes in the drawings were the fables (57%), followed by scenes of everyday life (38.4%) themes related to fight/ conflicts (28%), animals, and positive relations with peers (both variables 21%) personal experiences (16%) physical diseases and death (11.0% and 10.0%). The Emotional Contents were mainly of goodness (39.4%), joy (11.8%), and affiliation (13.5%) as positive emotions while for those negative we find more hostility (35.5%) sadness (13.5%), fear (11.4%). Finally, about the formal aspects of the drawings, the mostly observed were: heavy strokes (54.8%) with broken lines (70.6%), empty spaces (n=86, 37.7%), and erasers (n=32, 14.0%) with a prevalence of use of the black (52.7%) compared to the use of other colors 47.3%) and mostly have been reported human characters (82.8%) drawn in detail (n=144, 63.1%).

Sex differences in the distribution of the variables

Sex differences in the variables are shown in Table 2. Particularly, no statistically significant sex differences were found in the distributions of clinical scores of anxiety and depression and in trait EI scores and SI dimensions (all *ps* >.05). As regards the drawings, boys showed a higher frequency of negative outcomes compared to girls ($\chi2$ =10.60; p <.01). Focusing on the categories of the drawing evaluation grid, girls represented more frequently positive relationships between peers than boys ($\chi2$=6.60; p <.01) as well as emotional content of affiliation ($\chi2$=4.77; p <.05) and sadness ($\chi2$=6.68; p <.01) and formal elements related to a greater number of details in the drawn characters ($\chi2$=7.51; p <.01); while boys represented a significantly greater number of themes related to death than girls ($\chi2$=8.95; *p* <.01) while, with respect to the formal aspects of drawings, boys reported significantly more broken lines ($\chi2$=13.75; *p* <.01), and heavy strokes ($\chi2$=7.92; p <.01).

Table 2.

Frequency distribution and comparison between girls and boys

	Girls (n=115)	Boys (n=113)	Total (n=228)	χ^2
Grade[a]				.85
4th	49(42.6)	41(36.6)	90(39.5)	
5th	66(57.4)	71(63.4)	138(60.5)	
Age[b]	9.4(0.5)	9.6(0.6)	9.5(0.6)	4.95
Anxiety[a]				1.46
Non-clinical[a]	92(80.0)	82(73.2)	175(76.6)	
Clinical[a]	23(20.0)	30(26.8)	53(23.4)	
Depression[a]				.70
Non-clinical	100(87.0)	96(85.0)	196(86.0)	
Clinical	15(13.0)	17(15.0)	32(14.0)	
Outcomes[a]				10.60**
Positive	56(48.7)	41(36.2)	97(42.5)	
Comp. Positive	49(42.6)	46(40.8)	95(41.7)	
Negative	10(8.7)	26(23.0)	36(15.8)	
Themes[a]				
Fables	70(60.0)	60(53.0)	130(57.0)	.33
Everyday Life	51(44.0)	37(32.7)	88(38.4)	1.62
Personal	17(15.6)	19(16.8)	38(16.2)	1.21

Experiences				
Animals	26(22.6)	22(19.5)	48(21.0)	.02
Pos. Rel. Peers	34(29.5)	14(12.4)	48(21.5)	6.60**
Growth/transf.	27(23.5)	17(15.0)	44(19.2)	1.56
Physical Disease	18(15.6)	10(8.8)	28(12.2)	2.54
Death	6(5.2)	20(17.7)	26(11.4)	8.95**
Fight/conflict	30(26.0)	34(30.0)	64(28.0)	1.71
Emotional				
Contents[a]				
Happiness	17(14.7)	10(9.0)	27(11.8)	1.35
Goodness	54(47.0)	36(31.8)	90(39.4)	3.52
Affiliation	22(19.0)	9(8.0)	31(13.5)	4.77
Sadness	23(20.0)	8(7.0)	31(13.5)	6.68**
Hostility	39(34.0)	42(37.0)	81(35.5)	1.67
Fear	11(9.6)	15(13.2)	26(11.4)	1.49
Formal Aspects[a]				
Heavy Stroke	50(43.4)	75(66.3)	125(54.8)	7.92**
Broken Lines	68(59.0)	93(84.6)	161(70.6)	13.75**
Empty Spaces	43(37.1)	43(38.0)	86(37.7)	.03
Erasures	18(15.6)	14(12.4)	32(14.0)	.61
Color:Black	56(48.7)	64(56.6)	120(52.7)	1.46
Colors	58(50.5)	50(44.2)	108(47.3)	.53
Human Char.	99(86.0)	90(79.6)	189(82.8)	1.47
Detailed Char.	84(73.0)	60(53.0)	144(63.1)	7.51**
Missing B. Parts	56(48.7)	74(65.4)	130(57.0)	4.31
Poker Face	13(11.3)	26(23.0)	37(16.2)	4.17

Note: [a] Number (and % in parentheses) for categorical data. [b] Means (and standard deviations in parentheses) for interval data. F/χ^2= coefficient for interval/categorical variables comparison.

Correlational analysis

Results from the correlational analysis between variables are reported in Table 3. Specifically, negative outcomes were marginally positively related to depression scores ($p < .05$) but not to anxiety scores ($p > .05$) and marginally negatively related to the Social Skill dimension of SI ($p < .05$) while no significant relationship was found with trait EI and the other SI dimensions. Moreover, regarding the categories related to the grid of drawings, negative correlations were found between depression scores and fables themes (r=-.20; $p <.01$), and marginal correlation were found with animals (r=-.16; $p <.05$) and empty spaces (r=-.15; $p <.05$). As regard anxiety scores, they showed marginal negative relationships with Death (r=-.17; $p <.05$), and empty spaces (r=-.15; $p <.05$). Both in the case of anxiety scores and those of depression were not found statistically significant correlations with evident emotional content in the drawings ($p >.05$). As regards trait EI and SI, significant association were found only with the formal aspects of the drawings except for Social Skill dimension of SI that showed negative correlation with emotional contents of hostility ($p <.01$).

Specifically, trait EI showed a marginally significant negative relationship with heavy stroke (r= -.18; $p <.05$) while SI, with some differences in its dimensions, showed a marginally positive relationship with the presence of human and more detailed characters (Social Information Processing and Social Skill dimensions; $p <.05$) and empty spaces (Social Awareness dimension; $p < .05$). Finally, also some significant correlations emerged between the categories, which help illustrate the relationships between thematic, emotional, and formal aspects of the drawings. Particularly, negative outcomes correlated positively with Death themes ($r = .43$, $p < .001$) and Fear ($r = 0.308$, $p < 0.01$), and with formal aspects such as Heavy Stroke ($r = 0.296$, $p < 0.01$) while some emotional contents such as Hostility ($r = 0.256$, $p < .001$) and Fear ($r = 0.27$, $p < .001$) showed strong positive correlations with formal aspects such as Heavy Stroke ($r = .186$, $p = .016$) and Missing Body Parts ($r = -.27$, $p < .001$).

Table 3

Correlational analysis between variables and grid indicators

	1	2	3	4	5	6	7	8
1.Depression								
2.Anxiety	.45**							
3.Trait EI	-.58**	-42**						
4.SI-SP	-.12	-.14	.36**					
5.SI-SK	-.30*	-.31**	.56**	.25**				
6.SI-SA	-.29*	-.23**	.32**	.21**	.40**			
7. Outcomes(ordinal)	-.11	-.00	.10	.09	.06	.09		
8.Negative out.	.13	.00	.09	-.12	-.14	-.08	-.74**	
9.Fables	-.20*	-.05	.04	.10	.00	.12	.04	-.04
10.Everyday Life	.03	.03	.04	.02	.04	.04	.03	-.07
11.Pers. Experience	-.02	.03	.05	.07	.05	.04	.19*	-.08
12. Animals	-.16*	-.02	.02	-.01	.00	.01	-.04	.01
13. Physical Diseases	-.06	.04	.02	-.02	-.05	.00	-.08	.06
14.Death	-.03	-.17	-.09	-.18	-.01	.04	-.37**	.40*
15.Fight/conflict	.00	.02	-.02	-.07	.06	-.03	.10	.00
16.Happiness	.01	.10	.04	.12	.05	.03	.10	-.07
17.Goodness	.01	.00	.03	.09	.11	.03	.16*	-.36*
18. Affiliation	.01	.07	.02	.00	.06	-.09	.13	-.05
19. Sadness	.03	.07	.01	.02	-.04	-.04	.02	-.03
20. Fear	.00	-.10	-.02	-.11	-.02	-.07	-.17*	.16
21. Hostility	.03	.03	-.02	-.20*	.05	-.06	-.13	.16
22. Empty Spaces	-.15*	-15*	.14	-.02	.09	.20*	.05	-.06
23. Heavy Stroke	.13	.11	-.20*	-.08	-.12	-.03	-.20**	.18
24. Broken Lines	.01	-.05	-.06	-.13	-.00	.04	-.16*	.10
25. Erasures	-.09	-.09	.09	.00	.07	.03	-.03	-05
26. Color:Black	.03	.06	-.04	-.02	-.01	-.03	-.03	.13

27. Color Variety	-.02	-.05	.04	.04	.00	.02	.01	-.14
28.Human Characters	-.14	.00	.10	.00	.16*	.00	.04	-.10
29.Detailed Characters	.00	.01	.13	.18*	.16*	.10	.09	-.05
30.Missing B. Parts	.04	-.02	.00	.01	.08	.03	.05	.05
31. Poker Face	.03	-.01	-.10	-.13	-.10	-.04	.05	-.04

Note. For the sake of clarity, only correlations between variables and drawing indicators from the grid are presented (Outcomes: 7= outcomes ordinal scale, 8=negative outcomes dichotomous; Themes: 9=fables, 10= everyday life experiences, 111=personal experiences, 12=animals, 13=physical diseases, 14=death, 15=fight/conflict; Emotional contents: 16=happiness, 17=goodness, 18=affiliation, 19=sadness, 20=fear, 21=hostility; Formal contents: 22=empty spaces, 23=heavy stroke, 24=broken lines, 25=erasures, 26=color:black, 27=color variety, 28=human characters, 29=detailed characters, 30=missing body parts, 31=poker face). * Marginal Significance at $p < .05$; ** Significance at $p < .01$

Comparisons between children with clinical-non-clinical levels of anxiety and depression

Distribution comparison between clinical-non-clinical groups showed no age and sex difference between clinical and non-clinical groups. Moreover, children who have clinical levels of depression tend to significantly draw fewer themes related to fables ($\chi^2 = 7.28$; $p < .01$) and a marginally significant tendency to produce fewer themes of animals ($\chi^2 = 5.29$; $p < .05$) and more everyday life events ($\chi^2 = 5.09$; $p < .05$) while no differences were found about emotional contents and formal aspects in the drawings (Table 3). As regards anxiety, children who have clinical levels showed differences in some formal aspects of the drawings, such as a marginally significant tendency to produce fewer empty spaces ($p < .05$) and significantly more heavy strokes in the drawing ($p < .01$).

Table 4

Frequencies comparison between non-clinical and clinical groups

	Anxiety		χ^2	Depression		χ^2
	Non-clinical (n=175)	Clinical (n=53)		Non-clinical (n=196)	Clinical (n=32)	

	N(%)	N(%)		N(%)	N(%)	
Outcomes[a]			.91			.12
Pos. Out.	79(45.3)	25(39.8)		86(43.8)	13(40.7)	
Comp. Pos. Out.	72(41.0)	25(47.0)		82(41.8)	15(46.8)	
Neg. Out.	24(13.7)	7(13.2)		28(14.4)	4(12.5)	
Themes[a]						
Fables	76(59.8)	20(50.0)	1.20	120(61.1)	9(28.1)	7.28**
Everyday Life	65(51.2)	23(57.5)	.48	95(48.5)	23(78.4)	5.09*
Pers. Exp.	19(15.0)	8(20.0)	.57	30(15.4)	7(21.2)	.54
Animals	37(29.1)	11(27.5)	.04	61(31.5)	2(6.2)	5.29**
Physical diseases	18(10.2)	6(11.8)	.01	28(12.2)	3(9.3)	.78
Death	17(13.4)	2(5.0)	2.12	22(11.2)	2(6.2)	.67
Fight/Conflict	46(36.2)	18(45.0)	1.00	56(37.6)	14(43.7)	.32
Emotional Contents[a]						
Happiness	17(13.4)	8(20.0)	1.04	30(15.4)	4(11.1)	.23
Goodness	70(45.1)	20(39.8)	.32	106(54.4)	16(50.0)	.12
Affiliation	25(19.7)	6(15.0)	.44	36(18.4)	6(18.7)	.04
Sadness	24(19.0)	7(17.5)	.04	38(19.4)	4(11.1)	.74
Hostility	63(49.6)	18(45.0)	.25	97(49.4)	13(40.0)	.74
Fear	22(17.3)	5(10.0)	1.24	32(16.3)	4(11.1)	1.53
Formal Contents[a]						
Heavy Stroke	85(48.6)	39(73.5)	6.44**	107(54.6)	16(50.0)	.21
Broken Lines	112(68.5)	42(77.5)	1.18	133(68.0)	26(81.2)	1.56
Empty Spaces	54(42.5)	9(22.5)	5.18*	78(42.2)	6(18.7)	3.80
Erasures	21(16.5)	2(5.0)	3.40	28(14.2)	4(11.1)	.12

Color:Black	85(48.6)	26(65.0)	3.19	100(51.0)	18(56.2)	.06
Colors	65(51.2)	15(37.5)	2.28	94(48.0)	16(50.0)	.03
Human Char.	107(61.3)	32(60.3)	.39	162(82.6)	23(78.4)	.43
Detailed Char.	105(60.6)	38(71.6)	1.84	120(61.1)	22(68.8)	.66
Missing B. Part.	70(40.1)	25(47.1)	.67	112(57.1)	18(56.2)	.01
Poker Face	21(16.5)	7(17.5)	.02	32(16.3)	5(15.6)	.00

403
404 * Marginal Significance at $p < .05$; **Significance at $p < .01$**

405 **Discussion**

406
407 This research aimed to show how graphic techniques can be a valuable tool for use in educational
408 contexts and primary schools, thus constituting an important source of information about the inner world
409 of the child and its development. In particular, the question arose as to whether these instruments,
410 integrated with appropriate clinical questionnaires, may be useful in identifying clinical conditions
411 related to internalizing symptoms such as anxiety and depression, as well as socio-emotional functioning
412 in terms of emotional and social intelligences. This was done through an evaluation grid that investigates
413 cross-thematic, emotional content and formal aspects of children's drawings.

414 The results of the present study indicate that there are sex differences, particularly regarding the
415 outcomes of the Drawn Stories Technique. Specifically, boys seem to be much more prone to producing
416 Negative Outcomes in their stories than girls. These findings align with previous studies that have used
417 the Drawn Stories Technique both in clinical (Trombini et al., 2004) and in educational settings (La
418 Grutta et al., 2023). Additional sex differences were observed, with girls showing a greater tendency to
419 depict positive relationships with peers, while boys were more likely to represent themes related to
420 death. Boys also tended to produce drawings with elements such as heavy stroke or disproportionate
421 characters (Pons et al, 2004; Mancini et al, 2019; Chaidi & Digras, 2022).

422 One possible interpretation of these findings may refer to research indicating that these formal
423 elements of the drawing are associated with aggressiveness. The observed gender differences may reflect
424 different lines of development between boys and girls, particularly in terms of emotional expression.
425 Boys tend to display more externalized and less regulated emotions, while girls typically exhibit more

internalized and regulated emotions, especially regarding aggressiveness (laroque & Obrzut, 2006; Li, 2011; Lin et al., 2022; Khorshidi & Mohammadipour, 2016; Yang, Zhao & Sheng, 2019). These results, confirmed by other research with graphic techniques in similar samples by age (Daglioglu, Deniz & Kan, 2010; Deng et al., 2022; Matto et al., 2005), then suggest how gender and gender-related social differences can affect children's graphic production and internal experiences. Moreover, our results suggested that depression scores, unlike anxiety scores, are indicative of the presence of Negative Outcomes, but this effect seems to be lost in the comparison between clinical and non-clinical groups. We also see how the presence of aggressive or destructive elements and symbols, identified by contents of death and hostility, is associated with negative emotions and experiences traceable in negative outcomes (Trombini, 1994; Trombini & Montebarocci, 2004; Scafidi Fonti, La Grutta, & Trombini, 2015) and a heavy stroke (laroque & Obrzut, 2006); these aspects were also suggested by other authors in similar analysis (Jue & Kim, 2014).

In this regard, it is interesting that even if boys are more prone than girls to produce negative outcomes they did not show differences in depression scores and anxiety. This could be due to the fact that not all negative outcomes are the same, and there are many differences in the content of the stories that could change the "nature" of each negative outcome. They do not necessarily signal a prognostic indicator of an internalizing disorder but rather convey emotional distress.

Specifically, we observed that negative outcomes in boys were more frequently associated with aggressive content in their stories, such as death or conflict (this can also be seen in the gender differences across various categories), whereas negative outcomes in girls were more often related to emotional content, such as sadness and themes of separation. Starting from this consideration, we argued from the results of the present study and our previous one (La Grutta et al., 2023) that negative outcomes in boys might more often reflect externally directed aggressive behavior, even if not acted but only represented, while for girls, negative outcomes might represent issues more closely related to anxiety and depressive states. Future research is needed to test these hypotheses including also an evaluation of externalizing symptoms together with the use of drawings.

Interesting results have also emerged concerning the associations between the elements of the drawings and the other variables of the self-reports that emotional intelligence levels were negatively

associated with a heavy stroke in the drawing while social intelligence dimensions were positively associated with more human characters in the drawing and characters more detailed. These results may be related to the fact that emotional functioning in childhood is predominantly expressed in behavioral terms, and children with a lower ability to regulate emotions may tend to draw with greater intensity with thick strokes (Mancini et al., 2019). On the contrary, issues relating to social intelligence seem to have characteristics related to openness to experience, possibly reflected in a greater involvement of human characters in the drawing scene, drawn in more detail.

Differences were found between clinical and non-clinical groups regarding the themes of the drawings: children with clinical scores of depression were found to be less prone than the non-clinical group to produce fables and animals-drawings but more prone to produce drawings based on everyday life aspects. Differently, children with clinical levels of anxiety report differences only in the formal aspects of drawings compared to the non-clinical group: heavier stroke and more need to fill the space in the sheet available (less frequency of empty spaces). A possible explanation of the results can be given by the fact that children who show greater psychological difficulties, given by clinical scores of depression, may show greater difficulty in abstraction and access to fantasy, a more concrete thought that could reflect a greater tendency to remain anchored to reality even in the activity of drawing. However, no differences were found in the emotional contents and formal aspects of the drawings so it seems that depression affects more the “choosing of a theme” phase of the drawing not reflecting in manifest emotional aspects in the narration or drawing execution. In this regard, other studies confirm the urge to avoid expressing their psychological experiences in subjects with higher levels of depression, which can be translated into a scarcity of elements related to fantasy and greater omission/ disproportion of the components of the characters, especially in the face, element easily associated with emotional expression (Caetano et al., 2017; Deng et al., 2022; Matto et al., 2005; Yang Zhao & Sheng, 2019; Khorshidi & Mohammadipour, 2016).

Because of the characteristics of the drawn stories technique, which gives freedom in graphic production to children, more specific statements can be made. Thinking and developing a story pushes the child to produce some images, which then will have to be represented. Since no differences between clinical groups in emotional and formal aspects were found in this study, it seems that the depressive

elements affect more the choice of the theme and, therefore, the imaginative phase than the representative component of manifest emotional content or the execution of the drawings in terms of formal elements.

Differently, anxiety, especially in this developmental period, could be expressed through a more marked behavioral component, and for that reason, anxiety levels of clinical relevance seem to have a greater effect on the formal elements of the drawing, such as the heaviness of the stroke and the need to leave no empty spaces in the drawing (Jung & Kim, 2015; Laroque & Obrzut, 2006; Khoroshidi & Mohammadipour, 2015) concerning the elements related to the themes and the emotional components of drawing. Finally, if we focused on trait EI and SI, the first showed only marginal negative associations with the heaviness of the stroke, maybe reflecting better capacity in emotional regulation(Mancini, 2018), while some dimensions of SI showed marginal negative associations with contents of hostility and positive association with the presence, and more detailed figures of human characters in the drawings probably reflecting the cognitive nature of Social Intelligence construct in terms of social aspects of life, suggesting openness to other people and positive relationships with others.

Limitations and future directions

The results of this study should be interpreted with caution in view of certain limitations. First, referring to the sample, its number, although adequate, probably is not sufficient for validating the analysis grid, given the number of aspects investigated. Therefore, future research would expand the sample size, extending the evaluation also to adolescents to cover different developmental periods and expanding geographical location, with more schools and Italian regions that could be involved, to obtain a greater sample heterogeneity. Moreover, the results about the correlation between self-reported questionnaires for trait EI and SI demonstrate marginal and weak correlations, which could be attributed to the fact that self-report questionnaires used in childhood may be less valid compared to measures used for adults. In this regard, future research directions could include data triangulation with other significant adults, such as parents and teachers, using other-rated measures, including these important figures for a comprehensive assessment of children.

In addition, the sample involved, extracted from a school context, is divided into a clinical group and a non-clinical and only a small percentage of the sample showed clinical levels of depression,

bringing significant differences in the sizes of the non-clinical and clinical groups, which could impact the interpretation of our findings. The groups were divided using scores from self-report questionnaires, which may be considered less precise, and maybe could be considered indicative of potential risk rather than definitive clinical diagnoses, so the future directions could include the integration of a clinical group, evaluated with different methodologies (e.g. structured interviews, others clinical scales) to make the conclusions of the research more reliable. Moreover, a key limitation of this study is the exclusion of variables with a frequency below 10%, which, while necessary to ensure statistical robustness, may have led to the omission of potentially meaningful findings. Additionally, the selection of mutually exclusive variables, such as 'Heavy Stroke' versus 'Light Stroke,' aimed to minimize redundancy but may have restricted the exploration of patterns across these features.

Furthermore, although the Benjamini-Hochberg correction was employed to control for experiment-wise error, the large number of comparisons in this study highlights the need for caution in interpreting findings.

In light of all these limitations, although these initial results are promising, the analysis grid developed for this study has been used for the first time and will require additions and refinements to enhance its detail and utility. Particularly, reliability values varied from the weak agreement (e.g., Goodness: Kappa = .20; Boredom: Kappa = .20; No Emotional Contents: Kappa = .20) to great- excellent agreement (e.g., Negative Outcome: Kappa = 1.00; Personal Experiences: Kappa = 1.00; Heavy Stroke: Kappa = .83). Variables with a lower agreement, such as Goodness or Boredom, indicate potential areas for refinement in future iterations of the grid especially in the emotional contents categories that could necessitate wider and less specific categories maybe reflecting the difficulty children could have to differentiate goodness from happiness and boredom from sadness. Specifically, we intend to include exploratory factor analysis in future revisions to better understand the dimensional structure of the data collected through this grid. This approach will help ensure that each category is both distinct and significant in its contribution to our understanding of children's socio-emotional development.

Furthermore, the lack of studies that provide a detailed grid of analysis for various formal aspects, which could serve as a foundation for the content of the analysis grid used, represents a significant limitation in the field. This gap in the literature underscores the need for our evaluation grid and

highlights the innovative aspect of our research. In response, we plan to reassess and potentially consolidate categories based on their frequency and overlap, particularly for those categories that showed less inter-rater reliability or that had lower occurrence in this study. Specifically, the low frequency of these categories may suggest potential overlaps with other categories or indicate that they are too narrowly defined for the broad range of expressions found in children's drawings. Another aspect refers to the "subjectivity" of the assessment of the performance-based test, although the inter-rater reliability was moderate-good for the majority of the categories in this study, which is often criticized by many while depending on the formation of the researchers. However, it should be borne in mind that the assessment, in this case, is based as far as possible on evidence emerging from concrete aspects of the drawings, as regards the formal components, and less explicit aspects, but still easily extracted from the story about the themes and emotional content.

The analysis grid developed in this study can be applied in various contexts, such as hospitals, schools, and research settings, where the Drawn Stories Technique is commonly used. From the data collection phase, it became evident that the descriptive component of the drawing can provide valuable insights into children's emotional experiences. Studies using graphic techniques, such as the one conducted by Jung and Kim (2015), have shown an association between a lack of detail in the description of the drawing and the traumatic experiences that children have lived through.

For this reason, graphic techniques that include a description component could, in future research, provide deeper insights, alongside a more specific analysis of the drawing aspects considered relevant. It would therefore be possible to investigate the correspondence between the characteristics of the design and the features of the verbally reported story, not only in terms of the level of detail, but also the quality of both content and form. This could indicate an inability in the verbalization, which are often seen in individuals with painful internal experiences (Malchiodi, 2000).

Considering the points discussed above, it may be important to develop analysis grids that can systematically assess both the qualitative (Themes and Emotional Content) and quantitative (Formal Aspects) elements of drawings, as suggested by some grid elements explored in this study. These results have the potential to support, based on scientific evidence, the use of graphic techniques not only in childhood and pre-adolescence but also in later stages of life, together with other tools, allowing for

obtaining a wide individual assessment.

Conclusion

This study has explored the potential of graphic techniques within primary school settings as tools for identifying indicators that might suggest clinical conditions. While our results align with traditional interpretations of story outcomes as reflections of children's emotional states supported by different studies (La Grutta et al., 2023; Trombini, 1994; Scafidi Fonti, La Grutta & Trombini, 2015; Trombini & Montebarocci, 2004) they also bring to light the need for cautious interpretation.

The introduction of our evaluation grid for the Drawn Stories Technique is an attempt to provide a structured method to assess the association between drawing elements and children's socio-emotional functioning and psychological experiences, such as anxiety and depression. This method emphasizes that children’s drawings can be expressive of their emotional worlds, offering a means to articulate experiences of distress and various emotional experiences.

However, the promising aspects of this research should be viewed as preliminary. The evaluation grid, while a helpful tool, requires further validation to solidify its reliability for diagnostic use and broader research applications. Ongoing research is necessary to refine this tool, ensuring its effectiveness in capturing the complex emotional expressions manifested in children’s drawings. Future work will focus on addressing the current limitations and testing this evaluation grid’s efficacy in diverse settings, aiming to better understand and utilize graphic techniques in child psychology.

Declaration of competing interests

The authors have no conflict of interest to disclose.

Data availability statement

The data supporting this study's findings are available from the corresponding author, upon reasonable request.

References

Busnelli, C., Dall'Aglio, E., & Faina, P. (1974). *Questionario scala d'ansia per l'eta evolutiva.*

Organizzazioni speciali.

Camuffo, M., Cerutti, R., Lucarelli, L. & Mayer,R. (1988). *CDI (Children's Depression Inventory) Questionario di autovalutazione: manuale*. Firenze: Organizzazioni Speciali.

Chaidi, I., & Drigas, A. (2022). Social and Emotional Skills of children with ASD: Assessment with Emotional Comprehension Test (TEC) in a Greek context and the role of ICTs. *Technium Social Sciences Journal*, 33, 146.

Comuniani,A.L., Battacchi, M., Bernabei,P., Dazzi,N., Lingiardi, V., Di Nuovo,S. ,Passi Tognazzo, D., Del Corno,F. Lang, M.,Armezzani, M.,Lis,A. Gugliotta, M. & Benincasa, G. (2002). Tecniche proiettive. Proiettive di che? Contributi alla discussione. *Psicologia clinica dello sviluppo*, 2, 303–344. https://doi.org/10.1449/1194

Corman, L. (1967). *The Double in the " draw a family" test*. L'Evolution Psychiatrique.

Cox, M. V. (2013). *Children's drawings of the human figure.* Psychology Press Ltd.

Dağlioğlu, H. E., Deniz, Ü., & Kan, A. (2010). A study on the emotional indicators in 5-6 year-old girls' and boys' human figure drawings. *Procedia - Social and Behavioral Sciences*, 2(2), 1503–1510. https://doi.org/10.1016/j.sbspro.2010.03.226

Deng, X., Mu, T., Wang, Y., & Xie, Y. (2022). The Application of Human Figure Drawing as a Supplementary Tool for Depression Screening. *Frontiers in Psychology*, 13, 865206. https://doi.org/10.3389/fpsyg.2022.865206

Driessnack, M. (2005). Children's Drawings as Facilitators of Communication: A Meta-Analysis. *Journal of Pediatric Nursing*, 20(6), 415–423. https://doi.org/10.1016/j.pedn.2005.03.011

Fine, R. (1955). Manual for a Scoring Scheme for Verbal Projective Techniques (TAT, MAPS, Stories and the Like). *Journal of Projective Techniques*, *19*(3), 310–316. https://doi.org/10.1080/08853126.1955.10380641

Fury, G., Carlson, E. A., & Sroufe, L. A. (1997). Children's Representations of Attachment Relationships in Family Drawings. *Child Development*, *68*(6), 1154. https://doi.org/10.2307/1132298

Gini,G. & Iotti, G. (2008). Una misura multidimensionale dell'intelligenza sociale: Validazione preliminare della versione italiana della Tromsø Social Intelligence Scale. *Giornale italiano di*

psicologia, *3*, 665–678. https://doi.org/10.1421/27936

Goodenough, F. L. (1926*). Measurement of Intelligence by Drawings*. Chicago, IL: World Book Company.

Gross, J., & Hayne, H. (1998). Drawing facilitates children's verbal reports of emotionally laden events. *Journal of Experimental Psychology: Applied*, *4*(2), 163–179. https://doi.org/10.1037/1076-898X.4.2.163

Hammer, E. F. (1958). *The Clinical Application of Projective Drawings*. Springfield: Charles C Thomas

Harris, D. B. (1963). *Goodenough-Harris Drawing Test Manual*. New York: Harcourt, Brace & World.

Jung, J., & Kim, G. (2015). The use of a favourite kind of weather drawing as a discriminatory tool for children who have experienced physical abuse. *The Arts in Psychotherapy*, *43*, 23–30. https://doi.org/10.1016/j.aip.2015.02.002

Kennedy, E. K., Canagaratnam, M., & Shaldon, C. (2017). The use of projective assessment with children and young people*. Assessment & Development Matters*, 9(2), 25-28. ISSN 2040-4069

Khorshidi, S. Z. M., & Mohammadipour, M. (2016). Children's Drawing: A Way to Discover Their Psychological Disorders and Problems. *International Journal of Mental Health and Addiction*, *14*(1), 31–36. https://doi.org/10.1007/s11469-015-9607-5

Kim, J. K., & Suh, J. H. (2013). Children's kinetic family drawings and their internalizing problem behaviors. *The Arts in Psychotherapy*, *40*(2), 206–215. https://doi.org/10.1016/j.aip.2012.12.009

Kovacs, M. (1992). Children's Depression Inventory. CDI. Manual. Toronto, Ontario, Canada: Multi-Health Systems, Inc; 1992.

La Grutta, S., Piombo, M. A., Riolo, M., Spicuzza, V., Cianciolo, U. M., Andrei, F., Trombini, E., & Epifanio, M. S. (2023). Drawing techniques as tools for the evaluation of scholastic integration and emotional components in primary and secondary school: A cross-sectional study. *Frontiers in Psychology*, *13*, 1046626. https://doi.org/10.3389/fpsyg.2022.1046626

LaRoque, S. D., & Obrzut, J. E. (2006). Pencil Pressure and Anxiety in Drawings: A Techno-

653 Projective Approach. *Journal of Psychoeducational Assessment*, *24*(4), 381–393.
654 https://doi.org/10.1177/0734282906288520
655 Li, C.-Y., Chen, T.-J., Helfrich, C., & Pan, A.-W. (2011). The Development of a Scoring System for
656 the Kinetic House-Tree-Person Drawing Test. *Hong Kong Journal of Occupational Therapy*,
657 *21*(2), 72–79. https://doi.org/10.1016/j.hkjot.2011.10.004
658 Lilienfeld, S. O., Wood, J. M., & Garb, H. N. (2000). The Scientific Status of Projective Techniques.
659 *Psychological Science in the Public Interest*, *1*(2), 27–66. https://doi.org/10.1111/1529-
660 1006.002
661 Lin, Y., Zhang, N., Qu, Y., Li, T., Liu, J., & Song, Y. (2022). The House-Tree-Person test is not valid
662 for the prediction of mental health: An empirical study using deep neural networks. *Acta*
663 *Psychologica*, *230*, 103734. https://doi.org/10.1016/j.actpsy.2022.103734
664 Longobardi, C., Pasta, T., Gastaldi, F. G., & Prino, L. E. (2017). Measuring the student-teacher
665 relationship using children's drawings in an Italian elementary school. *Journal of*
666 *Psychological and Educational Research*, 25(1), 115.
667 Machover, K. (1953). Human Figure Drawings of Children. *Journal of Projective Techniques*, *17*(1),
668 85–91. https://doi.org/10.1080/08853126.1953.10380466
669 Malchiodi C. A. (1998). Capire i disegni infantili. Torino: Centro Scientifico.
670 Mancini, G. (2019). Trait Emotional Intelligence and Draw-A-Person Emotional Indicators: A First
671 Study on 8-Year-Old Italian Children. *Child Indicators Research*, *12*(5), 1629–1641.
672 https://doi.org/10.1007/s12187-018-9601-0
673 Mancini, G., Passini, S., & Biolcati, R. (2020). The Influence of Trait Emotional Intelligence and
674 Gender Interaction on Draw-A-Person Emotional Indicators during Childhood. *Child*
675 *Indicators Research*, *13*(4), 1187–1201. https://doi.org/10.1007/s12187-019-09690-y
676 Matto, H. C., Naglieri, J. A., & Clausen, C. (2005). Validity of the Draw-A-Person: Screening
677 Procedure for Emotional Disturbance (DAP:SPED) in Strengths-Based Assessment. *Research*
678 *on Social Work Practice*, *15*(1), 41–46. https://doi.org/10.1177/1049731504269553
679 Mavroveli, S., Petrides, K. V., Shove, C., & Whitehead, A. (2008). Investigation of the construct of
680 trait emotional intelligence in children. *European Child & Adolescent Psychiatry*, *17*(8), 516–

526. https://doi.org/10.1007/s00787-008-0696-6

McGuigan, W. M., & Pratt, C. C. (2001). The predictive impact of domestic violence on three types of child maltreatment. *Child Abuse & Neglect*, *25*(7), 869–883. https://doi.org/10.1016/S0145-2134(01)00244-7

Mihura, J. L., Roy, M., & Graceffo, R. A. (2017). Psychological assessment training in clinical psychology doctoral programs. *Journal of Personality assessment*, *99*(2), 153-164. https://doi.org/10.1080/00223891.2016.1201978

Motta, R.W., Little, S.G., & Tobin, M.I. (1993). The use and abuse of human figure drawings. *School Psychology Quarterly*, 8 (3), 162-169.

Pace, C. S., Zavattini, G. C., & Tambelli, R. (2015). Does family drawing assess attachment representations of late-adopted children? A preliminary report. *Child and Adolescent Mental Health*, *20*(1), 26–33. https://doi.org/10.1111/camh.12042

Piperno, F., Di Biasi, S., & Levi, G. (2007). Evaluation of family drawings of physically and sexually abused children. *European Child & Adolescent Psychiatry*, *16*(6), 389–397. https://doi.org/10.1007/s00787-007-0611-6

Pons, F., Harris, P. L., & De Rosnay, M. (2004). Emotion comprehension between 3 and 11 years: Developmental periods and hierarchical organization. *European Journal of Developmental Psychology*, *1*(2), 127–152. https://doi.org/10.1080/17405620344000022

Russo, P. M., Mancini, G., Trombini, E., Baldaro, B., Mavroveli, S., & Petrides, K. V. (2012). Trait Emotional Intelligence and the Big Five: A study on Italian children and preadolescents. *Journal of Psychoeducational Assessment*, 30(3), 274–283.

Scafidi Fonti, G., La Grutta, S., and Trombini, E. (2015). *Elementi di psicodiagnostica. Aspetti teorici e tecnici della valutazione.* Milano: Franco Angeli

Schweighofer, A., & Coles, E. M. (1994). Note on the Definition and Ethics of Projective Tests. *Perceptual and Motor Skills*, *79*(1), 51–54. https://doi.org/10.2466/pms.1994.79.1.51

Skybo, T., Ryan-Wenger, N., & Su, Y. (2007). Human Figure Drawings as a Measure of Children's Emotional Status: Critical Review for Practice. *Journal of Pediatric Nursing*, *22*(1), 15–28. https://doi.org/10.1016/j.pedn.2006.05.006

Søndergaard, E., & Reventlow, S. (2019). Drawing as a Facilitating Approach When Conducting Research Among Children. *International Journal of Qualitative Methods*, *18*, 160940691882255. https://doi.org/10.1177/1609406918822558

Swenson, C.H. (1957). Empirical evaluations of human figure drawings. *Psychological Bulletin*, 54, 431-436

Tressoldi, P. E., Pedrabissi, L., Trevisan, M., & Cornoldi, C. (2010). Un'indagine sull'uso dei test in età evolutiva: scelte basate sulla qualità o su pratiche condivise?. *Psicologia clinica dello sviluppo*, *14*(1), 125-129. DOI: 10.1449/32007

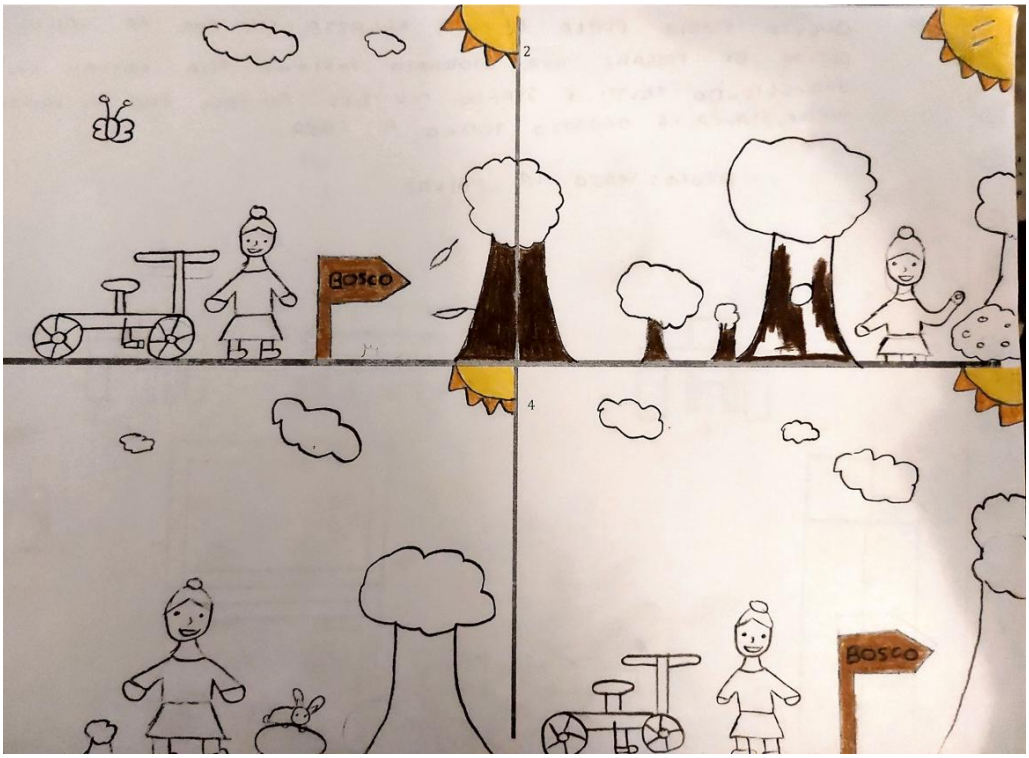
Trombini G. (1994) (a cura di). *Introduzione alla clinica psicologica*. Bologna: Zanichelli.

Trombini, E., Montebarocci, O., Scarponi, D., Baldaro, B., Rossi, N., & Trombini, G. (2004). Use of the Drawn Stories Technique to Evaluate Psychological Distress in Children. *Perceptual and Motor Skills*, *99*(3), 975–982. https://doi.org/10.2466/pms.99.3.975-982

Yang, G., Zhao, L., & Sheng, L. (2019). Association of Synthetic House-Tree-Person Drawing Test and Depression in Cancer Patients. *BioMed Research International*, *2019*, 1–8. https://doi.org/10.1155/2019/1478634

Figure 1.

Example of Positive Outcome



Description: A girl who loves nature walks happily in the wood with animals and picks some fruits

Figure 2.

Example of Negative Outcome

Description: A monster named "Siren head meets a child and kills him

Figure 3.

Example of Compensated Positive Outcome

Description: In a primary school class there was a very good teacher. One day her evil sister locked her in a closet and took control of the class making the life of the students a hell. The good teacher manages to break free, making the world a better place.