

PEDAGOGIA WALDORF E SAÚDE: UM DIÁLOGO POR MEIO DO DESENHO DA FORMA

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Resumo: Este estudo aborda o movimento a partir da prática do Desenho da Forma, realizado com 89 crianças de escolas Waldorf, com idades entre 7 e 11 anos, e considera o movimento como meio de interseção em ambientes sociais como a escola, e fisiológicos como seres humanos. As medidas foram realizadas no início e no final do ano letivo, em relação à postura e ao equilíbrio estático e dinâmico. As crianças desenvolveram linhas retas e curvas, e as incursões respiratórias foram medidas em três momentos do ano. Um questionário com 25 questões foi elaborado para avaliar cada criança, investigando sua concentração, organização e movimento. O estudo apresentou resultados significativos principalmente nas medidas de incursões respiratórias ($p < 0,001$), avaliação postural ($p < 0,001$) e concentração ($p < 0,001$), os quais foram corroborados pela observação dos cadernos. Todas as práticas pedagógicas Waldorf têm como premissa a arte de educar com ênfase na saúde humana, principalmente por meio do Desenho da Forma.

Palavras-chaves: Pedagogia Waldorf. Saúde. Desenho de Formas.

WALDORF PEDAGOGY AND HEALTH: A DIALOGUE THROUGH THE FORM DRAWING

Abstract: This study approaches movement from the practice of Form Drawing, carried out with 89 children from Waldorf schools, aged between 7 and 11 years, and considering movement as a means of intersection in social environments such as school, and physiological as human beings. Measurements were taken at the beginning and end of the school year, in relation to posture, and static and dynamic equilibrium. The children developed straight and curved lines, and respiratory incursions were measured at three moments of the year. A questionnaire with 25

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questions was created to evaluate each child, investigating their concentration, organization and movement. The study showed significant results particularly in the measures of respiratory incursions ($p < 0.001$), postural assessment ($p < 0.001$) and concentration ($p < 0.001$), which were corroborated by observation of the notebooks. All Waldorf pedagogical practices are premised on the art of educating emphasizing human health, particularly through the Form Drawing.

Keywords: Waldorf Pedagogy. Health. Form Drawing.

PEDAGOGÍA WALDORF Y SALUD: UN DIÁLOGO A TRAVÉS DEL DIBUJO DE FORMAS

Resumen: Este estudio aborda el movimiento a partir de la práctica del Dibujo de Formas, realizado con 89 niños de escuelas Waldorf, con edades comprendidas entre los 7 y los 11 años, y considera el movimiento como un medio de intersección en entornos sociales como la escuela, y entornos fisiológicos como el ser humano. Se tomaron medidas al inicio y final del año escolar, en relación a la postura y equilibrio estático y dinámico. Los niños desarrollaron líneas rectas y curvas, y se midieron las incursiones respiratorias en tres épocas del año. Se diseñó un cuestionario de 25 preguntas para evaluar a cada niño, investigando su concentración, organización y movimiento. El estudio mostró resultados significativos principalmente en las medidas de incursiones respiratorias ($p < 0,001$), evaluación postural ($p < 0,001$) y concentración ($p < 0,001$), que fueron corroboradas por la observación de los cuadernos. Todas las prácticas pedagógicas Waldorf tienen como premisa el arte de educar con énfasis en la salud humana, principalmente a través del Dibujo del Formas.

Palabras clave: Pedagogía Waldorf. Salud. Dibujo de forma.

Introduction

In this article, we want to collaborate to explain the thought built from Waldorf pedagogical practice observed through the science of humanities and medical science. An interaction proposed by the work is centered on the movement and its trail.

By developing the knowledge present here, we will be dealing with the human body image in a growing state of transformation. Because the body is socially projected, we will be investigating characteristics of the movement which alludes to human activities from an early age, providing a bodily flow and with this the resulting manifestation of thought.

The Waldorf School is premised on consistent and continuous observation of the child in a constant state of change. All curricular elements are exercised in order to collaborate with the healthy development of the body, emotions and cognition. Thus, the principle of activities is governed by the bodily movement from childhood to formal education during the first five years of schooling. The child jumps, runs, climbs, descends, twists, distorts, turns and walks, until images arise from the movement performed and these are channeled into artistic activities, and later cognitive ones. The whole body collaborates in the constitution of the image, and that there is a close concurrence between body gestures, nerve centers and symbolic representations (DURAN, 2002, p. 60).

Teaching done in a way in which the ontogenetic structure manifests itself, therefore adequate, was considered by specialists as a healing art (GLOCKER, 2002). The body, once experienced in its complexity, sensitivity, ability and capacity, overcomes cognitive loneliness when it does not find communication with the human being as a whole. During educational activities at Waldorf schools, the teacher, in the early school years, allows, encourages and drives multiple orders in the sequence, sometimes of games, sometimes of rhythmic exercises as a pedagogical procedure to structure and enable the physical body, emotions and the active manifestation of volition childish. All activities start from bodily movement, act on feelings and unfold in thoughts.

The investigation of our research enters the Waldorf school practice. There, the exercise of drawing straight and curved lines with variable meaning transposes an artistic activity, raising the understanding that each educator has about the human being so that, over the time the child is with them at school, they can prepare for it to happen in freedom. This freedom starts in the body and the body promotes movement. These movements can be traced through the lines, giving the smoothness to the configuration of a drawing in which the content, with all the scope of difficulties, exposes the corporeal nature of each human being, of each child.

It is understood that from this tracing, the path to cognitive and artistic activities can characterize a universe of possibilities. The resourcefulness for the conquered trait emerges from overcoming a difficulty, because through posture, balance and breathing, we realize how much one is ready to listen, read, calculate, for the continuous and rhythmic exercise of school activities. This should allow for free movement in order to gain attention and the deepening step to maintain concentration.

Thus, what children do with their hands only when they paint and draw, when they sing, must be gradually transferred, poured, drained into spatial movements, it must be a continuation of what human beings develop within their bodies during teaching. So the education of the body, of movement, is obtained from school teaching, being in intimate harmony with it (STEINER, 2014, p. 133).

For Steiner, the body must reflect the production of movements performed by the hands, for example, so that every organism can perceive it. Rocha reminds us that neural activity, as the interior signal of the cerebral luminous movement, indicates the close relationship between the movement that promotes the action and that exponent of language (ROCHA, 2009). The muscles act together, ascending a field of action for the body, sometimes exposing gestures, sometimes presenting ideas through oral language. They are surrounding movements.

The movements triggered by the human body in the child development stage must contribute to the child's full maturation in order to enable the chain of interrelated contents. Thus, the Waldorf school recognizes itself as promoting health, intermediating the categories of human intellection with art and movement.

Movement can thus be understood as not just material, here-to-there bodily transit, but an encounter with vital and often extra-individual processes and flows, some of which are essential to life and well-being. (...) It encourages us to push past the question of "what happens when health is gone" to consider how health is created and maintained daily (SOBO, 2015a, p. 140).

Sobo keeps saying:

Waldorf pedagogy takes an ostensibly non-interventionist approach to learning, contending that academic skills emerge as a child is ready. The teacher's job, accordingly, is to scaffold and optimize this process rather than to impart "knowledge" (SOBO, 2015b, p. 384).

Our research sought to investigate how movement expresses its trail through the Form Drawing in the first part of schooling in children aged 7 to 11 years. This study constitutes the relationship between the act of drawing straight and curved lines with physical posture, balance, breathing pattern and the ability to focus on

pedagogical content in a school environment. It is important to note that Form Drawing is part of the curricular activity in Waldorf schools.

About Form Drawing

In September 1919 the first Waldorf school was founded in Stuttgart, Germany, and with it a new approach to the human being. The curriculum was prepared with an emphasis on the arts as a means of combining intellectual subjects with physical discipline. In this context, two new themes are developed; Eurythmy and the Form Drawing.

The *Ars lineandi* of the Middle Ages is one of the oldest artistic forms of humanity, as well as the cave drawings. The art of the Langobards, the Irish and the illuminations are a historical expression of the *Ars lineandi*, an art manifested by the presence of lines.

The Form Drawing is a kind of representation of this art, above all its structure must be ordered, sequenced and characterized for the pedagogical work in order to collaborate in the maturation of writing, its resourcefulness, aesthetics, harmony and, therefore, overcoming large challenges. Since the lines are elaborated with the dynamic presence of the author's manuality, an exercise in tracing from the body experience is understood, followed by linear and/or surrounding training, with or without flow, but with the presence of spatial awareness and the strength of temporality in the drawn rhythms, through long or short traits.

The dynamism of the movement results in the trace, when it can be traced on a sheet (NIEDERHAUSER; KIRSCHNER, 2008), making room for the observation of the trace, the correspondence to the purpose of its execution and harmony in the achievement of the reticulation. Thus, the representation of the long or short straight is considered, for each one the tracing time, the time in which dedicated attention can vary according to the degree of ability to balance and sustain breathing in an activity of interior movement and, with that, the manual skill in using the pencil to develop a drawing composed of straight and curved lines.

Reaching school life requires bodily maturity and a readiness to listen, to order what was experienced in the body, providing the capacity for intellection without fragmenting attention. Thus, learning acquired the strength to carry out the school contents with meaning. Body geography is developed through the perception of

space and its corresponding learning, freeing up movements, making joints flexible and the body light. With the movements freed, the discipline for listening and for learning, as it is essential, becomes possible.

The child should sit down to write or draw, placing their feet parallel on the floor, in order to keep the spine in its erect axis and, thus, allow the respiratory flow so that through the organism they can feel well being and activate the whole body, uniting at will in performing the task proposed by the teacher. This is the proper posture for Form Drawing on the table, when the body, after the movement, prepares to act at rest.

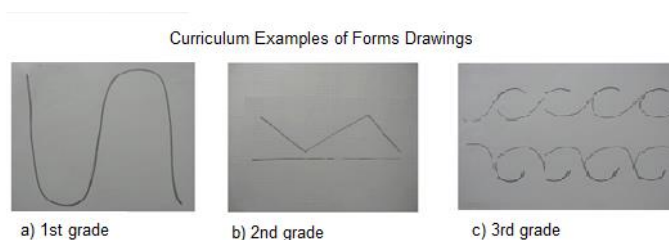
According to Steiner (2003), writing and reading must be taught through art to act in harmony with the bodies. Thus, the child develops the ability to perceive their movements by tracing lines, demanding attention based on the aesthetic and artistic element, so that, through learning, they can subtly present their therapeutic value, acting profitably. “The first elements of drawing and painting must precede writing, as they act on the limbs and chest and only indirectly on the head (STEINER, 2008, p. 131)”.

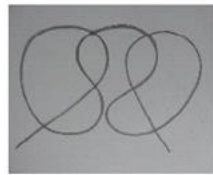
When we observe the child drawing the lines, we assess his breathing and then its expression on the paper through the rhythm, the frequency externalizing the long or short line, which may correspond to the respiratory depth when this indicates the amplitude of the inspiration in relation to the expiration.

Form Drawing enables a contemplative experience for children, preparing them to think and understand geometric laws. Furthermore, the tracing becomes a language as it is harmonized and becomes expressive. Thus, the child stops the external movement and allows it to become internal. An intimate relationship with space.

By way of illustration, figure 1 presents some drawings usually made with children in the practice of Form Drawing, which contain guiding principles of the curriculum mentioned above.

Figure 1 – Examples of Form Drawings worked on in the early years of the Waldorf Schools.





d) 4th grade



e) 5th grade

Methodology

Our study took place during 2018 in three Waldorf schools in the state of São Paulo (Brazil) evaluating, monitoring and observing 89 elementary school children between 7 and 11 years old. It is an observational, longitudinal and prospective approach. The children were distributed as follows: 15 children from the 1st year, 16 children from the 2nd year, 25 children from the 3rd year, 13 children from the 4th year and 20 children from the 5th year. The importance of varying the participating schools is due to the comprehensiveness of the diversity of pedagogical resources in the common physical environment.

The children were measured twice a year, once in March, before starting work with the Form Drawings, and another in November, at the end of the school year. The children were observed in relation to their posture, equilibrium, breathing incursions and the ability to concentrate. For physical measurements, we used the Postural Assessment Instrument (PAI) to assess posture (LIPOSCKI; ROSA NETO; SAVALLI, 2007), Romberg, Romberg-Barré and Untenberger to assess static and dynamic equilibrium (ZACARIAS, 2005; MELO *et al.*, 2017), (NEVES; LEITE, 2016). All of these instruments are validated. Respiratory incursions were measured during the act of drawing shapes at three times (March, August and November 2018).

To measure the children's posture, a symmetrograph was used. This instrument consists of a matrix formed by crossing vertical and horizontal lines, identified with letters and numbers, which facilitates the reading and recording of the observer. These measures allow us to identify the asymmetries resulting from the postural change. From the notes in the PAI, a score was created through the simple sum of the findings, where the presence of a deviation was computed by 1 and the absence by 0. Thus, the higher the score value, the greater the compromises with the posture of the kid.

The Romberg measure consists of the child standing with legs and feet closed, parallel and eyes closed for at least 60 seconds in a static position. In case there is

imbalance and one of the feet is removed from the initial position so the test is considered as Positive.

In the Romberg-Barré measure, the child places the right foot in front of the left, touching the heel of the right foot to the toes of the left foot, remaining in this position for 60 seconds. If one of the feet moves, with imbalance, it will be considered Positive.

The Unterberguer measure consists of proof of the march without leaving the place. The child closes both eyes and with the arms raised in front, at the height of the shoulders, the legs alternate in march, raising the knees to the height of the hips (in 90°). If the child makes any displacement, to the left or right, it will be considered Positive (MELO *et al.*, 2017).

Additionally, a questionnaire was created, shown in table 1, containing 25 questions. The regent teacher answered it, for each child, based on his observation of the child's ability to concentrate, organize and move. Another questionnaire was produced to assess the children's final performance considering five categories: language, math, global performance, behavior and movement. In each of them the child was ponted as Insuficiente, Regular, Good and Very Good.

Case studies were carried out from the observation, monitoring and comparison of graphic material such as Form Drawings, language and math notebooks, considering the respective school years surveyed, during the measurement period.

To emphasize the research project, and try to isolate some confounding variables, a single and precise method of instrumentalization of work and pedagogical activities was proposed, regarding the theme of Form Drawing, for all participating teachers. We sought, therefore, to reduce the effects of the heterogeneity inherent in the pedagogical procedure, as well as the periodicity of drawing shapes, which sometimes shows up in irregular practice. To conduct a joint study based on the observations made by the teachers, a team of 12 people was formed, including a physician, a physiotherapist and other interested teachers. This study group met bimonthly throughout 2018.

For each class a sequence of Form Drawings was developed. This sequence was worked with each teacher even before applying it to their classes. The consequent observations generated by the team produced the case studies. In this follow-up, it was possible to recognize the needs indicated by each teacher and the difficulties in the applicability of the drawings. In all, the group's specialist developed,

specifically for this work, around 1000 drawings organized in sequences that considered the children's age group and school flow. The drawings were performed daily by all children of study.

Table 1 – Questionnaire designed to assess children's concentration, behavior and ordering.

	Question
1.	How does the child usually sit down to write in the notebook? a. Straight spine and feet on the floor (0); b. relaxed trunk and legs (1); c. lay shoulders and head on the table (3); d. crosses legs (2); and others (3)
2.	After the exercise of writing, the child tends to be: flushed (0) or pale (1)?
3.	Does the child pay attention to listening to the instructions in the class? YES (0) NO (1)
4.	How long can the child remain attentive to the content presentation? Almost never (2) Uncommon (1) Very common (0)
5.	Does the child get up from the chair during class without permission? NO (0) YES - How often? Sometimes (1) Often (2)
6.	Does the child rock in the chair during class? NO (0) Yes how? a. front - back (1), b. side (1), c. only the legs (1), d. only the feet(1), e. only the trunk (1), f. whole body (3)
7.	Does the child usually wear shoes in the classroom? YES (0) NO (1)
8.	During writing and/or drawing activities, how is the student's desk? a. very organized (0); b. Poorly organized (1); c. Disorganized (2).
9.	When the child is given an order in which there is more than one component to be made, does he/she fulfill the entire order in the sequence heard? YES (0) NO - a. it partially fulfills the task (1); b. she doesn't fulfill the task because she forgets the orientation given (2); c. others (3)
10.*	How does it occupy notebook space in drawing and writing? a. Use all the space to draw; b. centers the drawing; c. uses all space to write; d. the font is large and the available space is insufficient; e. centralizes writing; f. the letter is small and there is space left over on the sheet (in this case, indicate the side on which the space is occupied D E; TOP BOTTOM); g. others .
11.	Does the child faithfully copy the text on the blackboard in his notebook, regardless of the spatiality used? YES (0) NO (1)
12.	Does the spatiality of your notebook interfere in the way of conceiving the spelling? YES (0) NO (1)
13.	The time spent by the student for writing is: a. on the average of the class (0); c. above average (1); c. below average (1).
14	Is the child organized with their materials? YES (0) NO (1)
15.	Does the child assiduously fulfill their tasks? YES (0) NO (1)
16.	When she walks into the room does she bump into tables and chairs? a. often (2); b. sometimes (1); c. do not bump (0).
17.	Does the child have any vision problems? YES (0) NO (1)
18.	Does the child have any hearing problems? YES (0) NO (1)
19.	Does the child have any motor problems or difficulties? YES (0) NO (1)
20.	Does the child have flat feet? YES (0) NO (1)

21.	Does the child have a physical disability? YES (0) NO (1)
22.**	Check below the movements, if any, that are performed by the child: a. jump rope; b. walking on a wooden leg; c. climbing trees; d. descend from a tree; e. just jump; f. to spin; g. run; h. walk; i. others.
23.***	Check the organ dominance below: a. Eye D E, b. Ear D E, c. Hands D E, d. Foot D E.
24.	Does the child hold the pencil correctly? YES (0) NO (1)
25.	Does the child draw spontaneously? a. daily (0); b. twice a week (0); c. 3x per week (0); d. sporadically (1); e. does not draw (2)

* In this question, the score depends on age, the values ranged from 0 (when there is no problem), 1 or 2 (when there was a problem).

** If scored from 1 to 3 activities (2), if scored from 4 to 5 (1); marked 6 activities or more (0).

*** In this case the scores follow the following: a. No crosses (0), b. crossover occurs (1); c. there are two crossings (2).

The language and mathematics notebooks were added to the drawings, becoming parameters to observe possible changes in spelling and organization, comparing them at the beginning and at the end of the school year. It is important to emphasize that the notebooks at the Waldorf School do not have lines to write, and the student himself is responsible for directing and organizing his writing.

Ten criteria were considered for observation and evaluation of the notebooks and each item was evaluated as Good, when the criteria are fully satisfied; Regular, when the items fluctuate, sometimes maintaining the criteria of the item and sometimes not reaching the same; or Unsatisfactory, when the requirements were not even partially achieved.

The criteria considered were: 1. Spatial relationship in leaf occupation; 2. Font size; 3. Harmony between the letters that contain stem line and loop; 4. Horizontality in writing; 5. Flow expressed in the connection between letters (cursive); 6. Balance in the continuity of sentences considering the vertical spacing; 7. Relation between the parallelism of numbers in mathematics; 8. Mirroring of numbers and letters; 9. Matching the horizontal plane (top and bottom) to arm the four operations; and 10. Appropriate use of the notebook in terms of continuity of writing and/or exercise from left to right. Data were analyzed using statistical tools suitable for each situation. Since most variables were qualitative or semiquantitative, we used mostly non-parametric statistical tests. Thus, for comparison between two paired samples, we used the Wilcoxon rank test. Categorical variables were compared using the McNemar test (chi-square version for paired data). When the variable was

quantitative, we used ANOVA with repetition to compare more than two paired samples. These analyzes were performed using SPSS and Excel softwares.

This research was approved by the Ethics Committee of the Faculty of Medicine of the University of São Paulo (number CAAE 91085418.2.0000.0065). Each family participating in the research received and signed the Informed Consent Form.

Results

The postural assessment test revealed a gain in the postural quality of the analyzed Waldorf children. The difference shown in figure 2 was statistically significant (Wilcoxon, $p=0,008$).

Figure 2 – Postural Assessment Instrument Score for the Waldorf School.

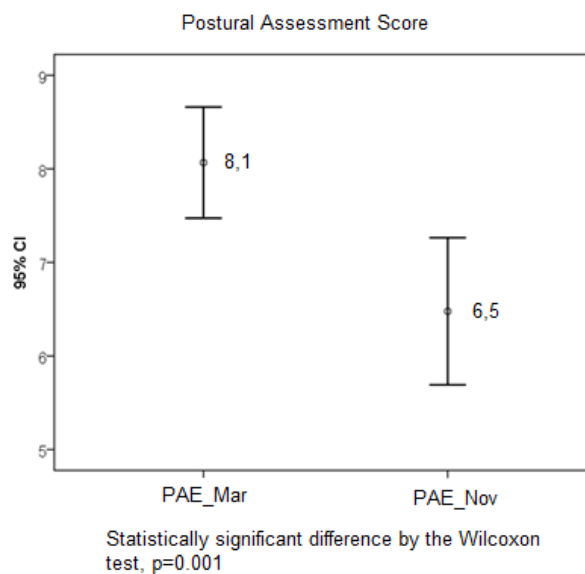
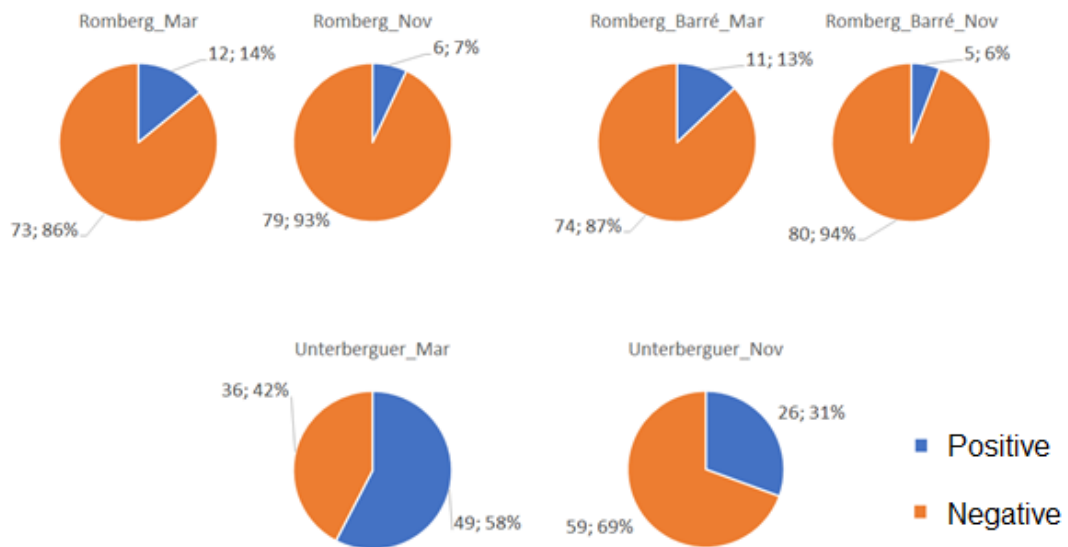


Figure 3 presents the measures measured at the Waldorf school. It regarding static Romberg balance we have, between the first and second measure, an absolute decrease in the sample of 6 percentage points in the number of positives, but this difference is not statistically significant (McNemar, $p=0,146$). A similar situation was observed in the Romberg-Barré equilibrium measure, with an absolute decrease of 6 percentage points, this difference being non-significant (McNemar, $p=0,146$). However, the Unterberguer dynamic equilibrium showed an absolute decrease of 27 percentage points in the number of positives, which was a statistically significant improvement (McNemar, $p<0,001$).

Figure 3 – Equilibrium measures: a, Romberg; b) Romberg-barre; c) Unterberger; at the beginning and end of the school year.



When we consider the concentration questionnaire, we see that the question that showed the greatest difference in time was question 1, which addresses the way the child sits at the desk to write. In March we had 28 children who sat with their feet on the floor and spine erect to write. At the end of the school year, 63 children presented this posture. Figure 4 shows that there was a significant decrease in the concentration score between the beginning and end of the school year (Wilcoxon, $p < 0,001$). This means that the children improved, in the teachers' assessment, their behavior, concentration and organization.

Figure 4 – Concentration and Behavior Score for the Waldorf School.

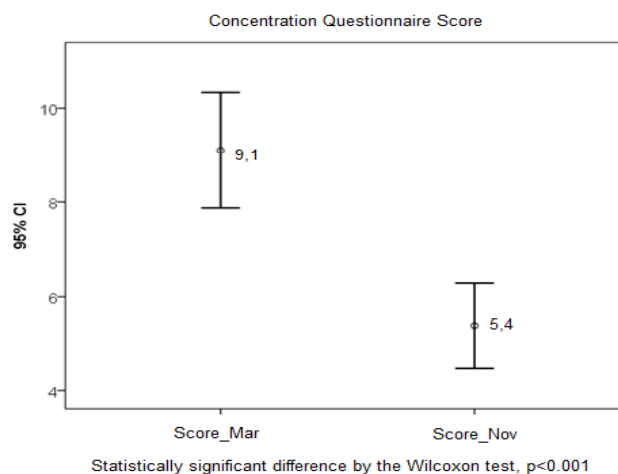
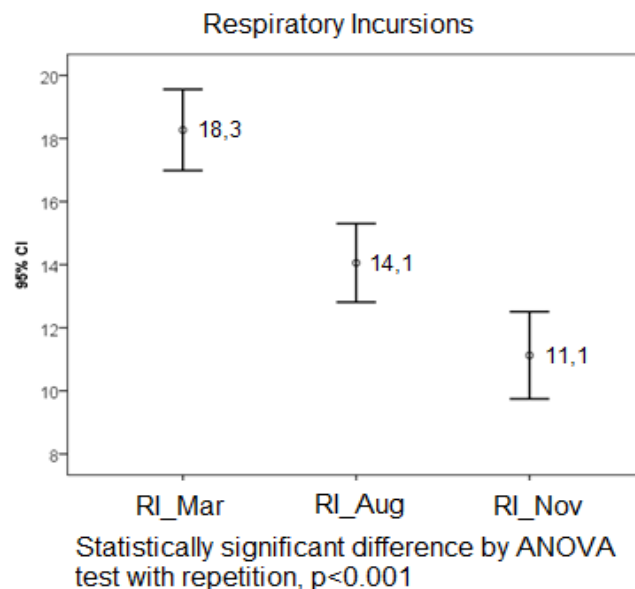


Figure 5 shows the results of the respiratory incursions performed during the act of Form Drawing. We see that there was a statistically significant and progressive decrease in the number of respiratory incursions (ANOVA, $p < 0,001$). This indicates that the children acquired a longer breathing throughout the year while making the drawings. It was reported by the teachers that this calmer breathing pattern extended to other activities developed in the class.

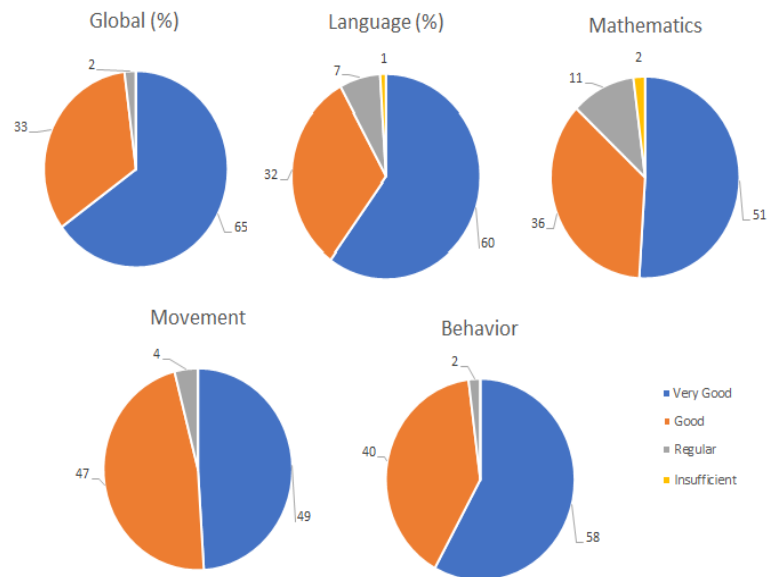
Figure 5 – Breathing Incursions for Waldorf School Kids.



The results for the Final Performance of children at the end of the school term are shown in figure 6. We see that in most categories the children were considered to perform Very Good in a proportion greater than 50%. Overall Performance was considered Very Good for 64.7% of children.

The specific performance of Language and Mathematics show a small difference, the result being better in the assessment of Language performance. The worst performing category was Mathematics. In the Movement category, we see that 97% of children were considered to perform at least Good. The best performance was in the Behavior category. Only in the assessment of Language and Mathematics were there percentiles in the Insufficient classification.

Figure 6 – Waldorf School Children's Performance.



Case Studies – Analyzing the drawing of forms

The case studies are exemplified here through two 1st grade and two 4th grade children. As for the first example of the 1st year, the straight line drawings were registered at two different times (April and September). The language notebooks indicated either single words or phrases. The distance between one track and the other is approximately 4 months, considering a winter break in the middle of July.

In the figure 7a we can see that the child A performs all three parts of the drawing, but in the sequence in which the curve precedes the straight. There is a sinuous tendency to reticulate the line, especially in the center when the curve becomes a central vertical length, detail for the base line lower when the child extends the line as a horizontal extension. We observed the adjustment in the transfer through all lines, but showing breaks. In the second part of the drawing, two of the three vertical lines are in different sizes. In the third part of the drawing, the tracing is retraced and the straight lines are disconnected. The spacing does not equal the same distance proposed by the reference drawing.

In figure 7b, we have the second drawing made in September/2018, containing diagonal lines in the opposite direction. We can see a more centralized image, in which there is no overlapping of lines, giving greater clarity to the drawing. The diagonal lines on the left side are more precise and the spatial distance between them is corresponding. The straight lines show themselves with a subtle sinuosity, exactly as the line was oriented. The distance between the diagonal lines on the right is equivalent, but there is less distance in relation to the opposite side. The stroke was made from top to bottom and broken as expected, but the beginning points do not meet. The drawing is clean, without any erasures. As for the writing carried out in September/2018, we observed a good regularized spacing between the three sentences (quati quer sua quota de queijo) and the search for vertical alignment between them.

Figure 7 – Example of Form Drawings and writing by child A, 1st grade.



Another example of a 1st year child is shown in Figure 8. We see that the drawing made by child B in April/2018 has good equivalence between the lines, as proposed in the drawing (Figura 8a). The lines grow downwards, they are very

reticular and without passing through. The design made in September/2018 is centered, the diagonal lines show regularized space between both sides (right and left), there was no break of the line (Figura 8b). The complete picture is clean, without erasure and sharp.

Figure 8 – Example of Form Drawings and writing by child B, 1st grade.



In child B's writing we have a short sentence containing three parts (Figure 8c). The writing made in March/2018, in capital letters as follows the Waldorf schools program, shows the occupation only at the bottom of the notebook page (A ROCHA ROLA). The letter is in large size but readable; the letter R has a different size in relation to the other letters. The letter A in the word ROCHA, like the letter R, is small and in the word ROLA it remains. The letter O in the first word is open and the second closed, despite the smooth break in the line.

The second writing (Figure 8d) carried out in October/2018 expresses a sentence in three parts distributed in three different "lines" (HOMERO É HUNGARO HOMEM HONESTO E HABILIDOSO). We observe good spatial regularity. The font size is stable and sharp. A harmonious change is visible in which there is continuity in the layout of the letters and the notion of spatial distribution on the sheet.

In figure 9 we see the drawing made by a 4th grade child. In the 1st week of May 2018, it is misaligned and without spatial organization (figure 9b). These characteristics are overcome in the repetition of the design in the 4th week of the

same month following the same design proposal (figure 9d). In this case, we did not have the child's notebook corresponding to the same period of the drawing.

Figure 9 – Example of Form Drawings by child A, 4th grade.

Exampes of drawing by child A, 4th grade

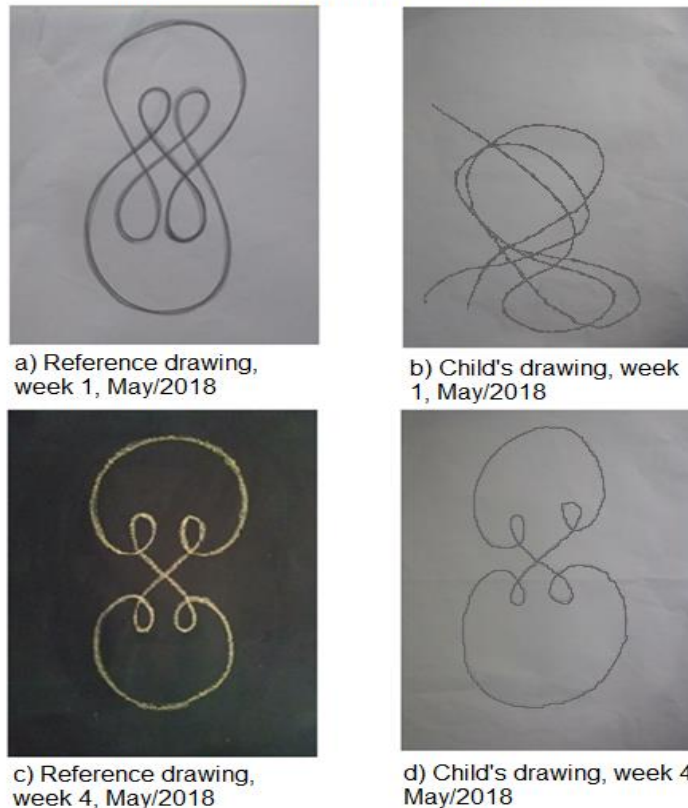


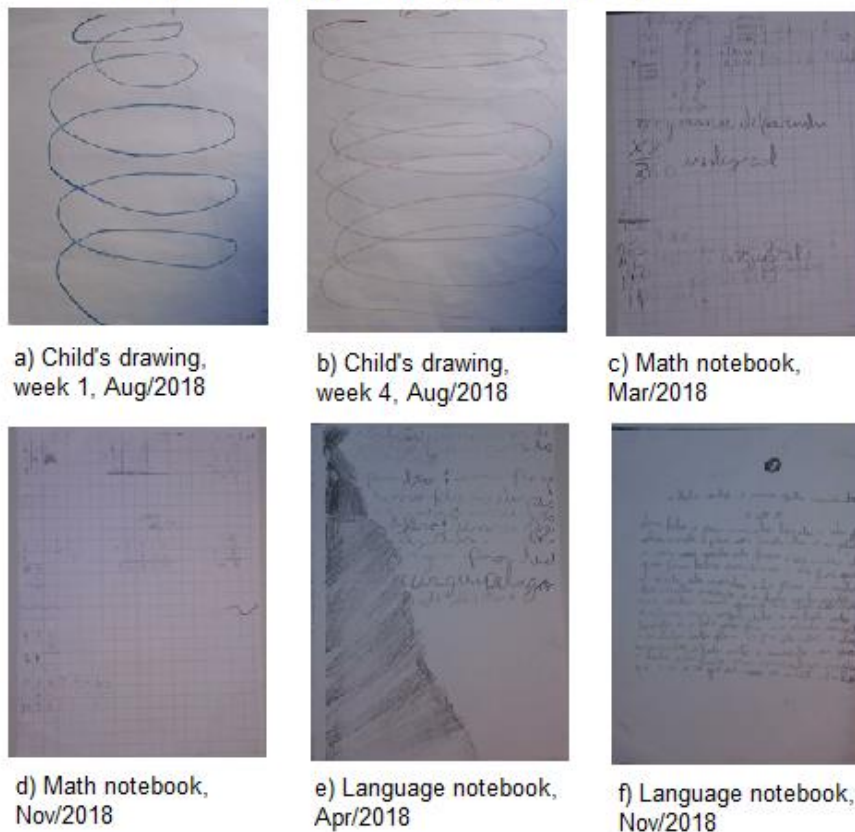
Figure 10 shows children B's drawings and notebooks, also from the 4th grade. The first drawing, made in the first week of August/2018, is a counterclockwise spiral (figure 10a). We see, however, that the lines have greater regularity in the drawing made in the 4th week of the same month (figure 10b). These are centered on the sheet and spaced accordingly. There are no overlaps in the tracing, and it is continuous and clear.

On the other hand, when observing this child's math notebook, we can see that it has a disorganized mathematical writing in March/2018 (figure 10c), without corresponding to the square space of the math notebook. Later, in November of the same year, writing was spatially ordered (figure 10d). Regarding writing, we see that it is not aligned (figure 10e). Written sentences do not obey the spatial distance between the reticular "lines". In the same month, sometime later, the child prepares

his own text for the first time. The result shows greater stability between lines and legibility in words (figure 10f). The language register presents an approximation between the written “lines”, which are spatially equivalent. There was a change in font size between April and November and the words were written with flow.

Figure 10 – Example of Form Drawings and writing by child B, 4th grade.

Examples of drawings and writing by child B, 4th grade



Regarding the evaluations of the notebooks, 18 math notebooks and 32 in Portuguese were analyzed according to the criteria described in the methodology. Table 2 presents the summary of the results, showing the percentage of notebooks classified as good and the percentage of notebooks that improved in the period. We see that in all possible categories there was improvement. The category in which the children showed the best result was Relation between parallelism of numbers, in which all notebooks were evaluated as Good.

The improvement in all categories was above or equal to 43%. In mathematics, we have that six, of the ten categories evaluated, the improvement was 67% or more.

In language, we have that in six (out of eight categories analyzed) the improvement was also equal to or greater than 67%. A worsening was observed in only two students, both in the math notebooks. One in the Occupation of space in the notebook category and the other in Horizontality in writing. In both cases the child assessed as Good became Regular. On the other hand, the Font Size category was initially the one with the highest number of children with difficulties (13 out of 16). However, at the end of the process, the 13 children showed improvement.

Table 2 – Assessment of math (18) and Portuguese (32) notebooks, both paired.

	MATHEMATICS		LANGUAGE	
	% Good Notebooks	Improvement %	% Good Notebooks	Improvement %
Mirroring letters and numbers and swapping letters	83	50	94	100
Using the notebook for left-to-right writing or exercise	72	100	81	50
Relationship between number parallelism	100	0	—	—
Matching the horizontal plane to arm math operations	61	83	—	—
Occupation of space in the notebook	78	67	72	67
Font size	72	75	56	100
Horizontality in writing	78	0	84	75
Balance and continuity of sentences considering vertical spacing	56	67	63	50
Letter flow *	50	67	50	83
Harmony between stem and loop *	13	50	21	43

* These criteria were evaluated only in the 4th and 5th year notebooks (fourteen notebooks were observed).

Discussion of Results

This study sought to address the observation about the practice of Form Drawing as a research matrix, involving a diversity of physical measurements in children between 7 and 11 years old. Over the course of the year, approximately 1000 drawings were made by the children and observed in this study. These contained a lot of information about the movement of each one, manual movement, distal, postural, balance and consequently the interaction with space especially. In relation to writing and verifying notebooks, we were able to establish questions in order to approximate the tracing to the spelling.

The children measured in our study showed statistically significant changes in the dynamic balance measure. The child's ability to remain active in balance after the orientation was given only once was a relevant aspect in the teachers' report. The children also supported the order heard, through a command in order to generate an impulse promoted by a sequencing of actions. Although active listening was not evaluated in this study, the data presented indicate characteristics of balance present in the spelling sometimes of language and sometimes of arithmetic.

According to the questionnaire answered by the teachers, observing each child, there was a change in their attitude while listening to the guidelines given for carrying out activities in the classroom. Important observations were identified in the notebook writing. Notebooks are part of the important recording material and at the Waldorf school these are devoid of lines. We can suppose an association between listening and attention directed to a specific action, how say Campos: "Whether we are keeping our balance upright or walking, hearing can provide unique and important information to help optimize self-motion perception and therefore support safe mobility (CAMPOS; KHALAWANSINGH; PICHORA-FULLER, 2018, p. 43)".

Balance can be enhanced with signals emitted by the hearing to support mobility. Lubetzky (2020), in his research carried out in Korea with 3,864 adults who underwent the static and auditory balance test, found that those who had moderate hearing loss in at least one ear presented greater balance loss.

Considering the physical, emotional and cognitive development, can we conjecture that there is a possible dialogue between the eye, ear, hands and feet, for greater acquisition of cognitive ability in childhood? Once this dialogue is a reality, is it possible for focused attention to remain active longer?

On the other hand, the item involving body attitude for writing in the notebook showed change, registering an improvement in posture when writing, considering that the children started to put their feet on the floor keeping their spine erect (Question 1, $p < 0.001$ in the McNemer test). The records in the notebook are a fundamental part of learning at Waldorf schools, since they constitute the elaboration through the creative conception of authorship in which writing and illustration make up the image and content of each theme, thus forming a kind of "book". This implies a willingness to listen, record, absorb and process directions, executing them.

In addition, the transformed body attitude was expressed also when the questionnaire indicates changes to the involuntary movement of the feet and legs

when swinging in the chair during the time they remain seated in the class (Question 6, $p < 0.001$). Also, when they raise less in class without permission (Question 5, $p < 0.001$) and reduce the time needed to make copies in the notebook (Question 13, $p < 0.001$).

The results indicate an improvement in the children's concentration, indicated by a significant decrease in the concentration score. This improvement was observed and reported by teachers, and accompanied by a significant change in the time used for recording, which makes us wonder how much the time factor can relate to the space factor. The spatiality of the notebook does not seem to intervene in the spelling. Thus, the space used in the notebook is not relevant in relation to writing, despite the improvement in the correspondence of the written record when this was a copy of the blackboard.

The same occurs with the postural assessment score (PAE), the children showed a statistically significant improvement in postural adjustment at the end of the school year process ($p < 0.001$). This assumes a physical adjustment to walking, sitting, writing, reading and other activities that require proper posture.

Visits were made to Waldorf schools when it was possible to observe the posture and general movement of the measured children. All free movement in the park indicated total flexibility in locomotion, exercising their lower and upper limbs in opposite planes, such as going up and down, curling up and expanding, turning standing up and lying down on the grass, among others. The children, when running in free space during recess, presented a position of the trunk approximately at an angle of 60, which shows us a good balance for free movement.

In the classroom, reading the texts and writing, as well as the illustrations performed, required greater body awareness, as students, in general, kept their feet on the floor and their spine erect. We know that in order to write and read, it is necessary to overcome the transposition from the vertical to the horizontal plane, first done by copying it on a blackboard and later autonomously performing it in the notebook.

An improvement in writing is expected considering that the sheet used for graphing contains no lines. This is the motivation to discover, organize, develop and consolidate the spelling so that the spatiality is felt and experienced with the whole body. Experiencing the graphic letter through the layout allows the encounter of the aesthetic, harmonic and hygienic dimension to improve and cultivate the achievements in this activity. Writing allows for a sensation of rhythmic processes, as

according to Hildebrant, rhythm consists of movement and pause, it is order in time and, therefore, determinant for all healthy functional processes (HILDEBRANT; MOSER; LEHOFFER, 1998).

Considering that the act of drawing straight and curved lines expresses the human movement experienced by walking on the line and then written on paper through an appropriate posture, guided by the teacher, will it be possible to understand how a motor activity, that is absorbed and channeled into the trace, can contribute to the adjustment of the overall physical posture? For acquisition of cultivation in static and dynamic equilibrium? Does Form Drawing contribute to increased concentration and volition in children? Could this pedagogical practice contribute to the development of skills, transforming what was unskillful into skillful, incapacities into capabilities? Marti tells us that rhythm is essential for education: "Rhythmology points to the psychophysiology of development and is essential in the pedagogical work for the child's vitality (MARTI, 2003, p. 14)".

The significant decrease in the number of respiratory incursions, pointed out in this work, instigates an approximation between the investigation of these incursions and the dilated capacity to concentrate. If the measured breathing was performed during the execution of the drawing of straight and curved lines, promoting a decrease in time, we can think of a possible relationship between muscle strength and optic nerve, resulting in a joint action to emerge focused and enhanced attention known as concentration.

According to Steiner (2003), the activity flows into spatial movements depending on the way human beings develop within their organism, which establishes a bridge between the child's movement and its concentration. We see that in the period of 8 months, between March and November 2018, there was a significant change in the use of space in the squared notebook of the child referred to in the 4th year study. The order is born and a numerical traced is written respecting the synchrony of the square lines. The same can be seen in the construction of the text. In the executed drawings, we noticed changes in terms of size, centering and flow.

Developing an activity known as Form Drawing presupposes, prior to the stroke, a network of body movement exercises (circuits, jumping rope, cirandas, etc.) guided by the teacher. Before starting the drawing, children from 1st to 3rd grade daily walked on the line drawn on the floor or on a sisal rope. Then, armed with a chalk stick or thick colored pencil, with the two feet parallel on the floor, the erect

column traced the drawing on the A3 size sheet. This job took approximately 15 minutes. Every procedure for carrying out the activity was perceived as part of it and therefore incorporated and represented through the tracing, expressing attention and silence as individual and group behavior. Therefore, it is an activity where space and time are present.

The notion of space, of situating oneself in a place, to provide an outlet and a starting point for their activities, is also presented in language, mainly as a metaphor for spiritual determinations, to explain movement or positions. About the temporal content, its representation, it can be said that it is embedded in a context larger than the spatial representation, because it demands a unifying and separative reasoning that is both analytical and synthetic (CASSIRER, 2001, p. 237-238).

During the time of the activity, silence and stillness prevailed and, according to the teachers' reports, it extended beyond this time, resulting in a more nurturing behavior, more time in paying attention to the contents presented in class, listening and readiness to carry out the guidelines. For teachers, there was a visible change in walking and running, facing and/or overcoming motor challenges for some. These observations were mainly reported by teachers from the 3rd and 5th years, in which children started to perform movements that they could not before, achieving greater balance and postural adjustment. Sobo remember us: "Movement also helps stem disruptions that might be attributed to attention-related disorders in Other settings (SOBO, 2015a, p. 148)".

Checking the description of the performance evaluation, the most relevant is to highlight the movement and behavior category in which the Very Good classification is present. 58% of the children ended the year with a good evaluation in the behavior category, which can mean a kind of control of the bodies when they are in movement, while 49% of the children performed their movements very well, which can portray a percentage of students exercising greater control over their movements.

Teachers at Waldorf schools expect improvement in motor development, cognitive achievements, and overcoming difficulties in social life, as the pedagogical action plan contains a therapeutic aggregating element in order to stimulate, propel and prepare the child to dare to live the challenges of the world. According to a work developed by Marti and Heusser (2009), students from Waldorf schools have a better

quality of life when compared to other scenarios. Hueck (2014), in turn, showed that Waldorf students also have a lower incidence of diseases. According to Marasca (2019), educating and healing are artistic processes.

Final Considerations

Alexandroff us with representation as a result of the ability to internalize images: “Representation is a basic condition for the emergence of thought, as well as the ability to evoke and articulate internalized actions (ALEXANDROFF, 2010, p. 25)”.

The study carried out showed a change in posture, balance, concentration and breathing of the children observed. Teachers working in this research consider drawing as a way of expressing human development. The child experiences the course of this development when picking up the pencil and starting any trace. There is the improvement of the stroke reaching the achievement of writing. The child to write letters and numbers must master the straight and curved lines, the position and the spatial direction; facing literacy, the act of moving becomes fundamental.

Western writing moves from left to right in a continuous flow and when we emphasize the flow we remember the breath, the same measured during the act of drawing shapes. According to Higounet (2003), the direction of writing was also the result of motor learning, as prior to the 8th century BC, writing and reading was done alternately from left to right and from right to left, this sometimes required alternating hands. The writing began on the side that had completed the previous line, reversing the characters, a process known as the boustrophedon. This allows us to suggest a future relational study between this capacity, using the contraction of muscle force channeled by the upper limb, hands and optic nerve, and respiratory activity and human posture.

The erect human being has its point of balance in the sacral region. When the overall posture is harmonic, an alignment of the axis is understood, having as reference the spine supporting the head at rest, the lateralized limbs in a state of equivalence and the feet parallel on the ground, indicating body stability, that is, the body remains in a state of rest feeling internal activity. The cerebellum represents 1/8 of the brain's total weight, it coordinates instructions for motor control to maintain balance and body posture, playing an important role in different forms of motor learning.

When children draw the shapes through a habitual and imaginative procedure, the body prepares to align itself, to develop balance skills, to experience the internally drawn line, which produces a representation through the sensation provided by this willful and guiding act in motor skills.

The children achieved a more harmonic writing, clearer with the presence of flow when was used the cursive letter. Considering the presence of flow in the spelling for writing, which contains curved lines, curves drawn and exercised during the year at different times. Will it be possible to relate the achievement of this skill with the improvement of dynamic balance, as indicated in the Unterberger test? Future works can be dedicated to this and other possibilities of investigation, expanding the study presented here and suggesting new hypotheses. This will be really important to analyze the consequences that the lack of movement may have caused to the children in the post pandemic situation.

The school we have today and the school we want to have must be visualized through a bridge as the image of time; past and future. Social, cultural, emotional, religious and physical elements can contribute to expand these desired capacities and keep human life healthy. We think how much the teacher must be a constant observer and investigator of the motivations leading children to achieve fullness in their development.

We understand the limitations of this work when the main focus was to investigate five classes of Waldorf schools. These are schools in which pedagogy differentiates an educational practice, a practice in which the emotional, cognitive, cultural and physical life of each child is inserted in the teacher's observation, in his methodology and didactics. In future work, it will be interesting to form a control group, that is, a school whose pedagogical practice differs from the premises of Waldorf pedagogy. This will contribute to a deeper understanding of the role that Form Drawing can play in the child's education.

Finally, we want to point out that education, in managing all aspects that translate into bodily, social and cultural harmony, approaches and relates to the concept of health mentioned here. This link can act as a prophylactic action, a preventive path in the formation of human education.

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