

# Temperament differences in boys and girls from 3 to 5 years old

## Abstract

The present study tried to determine if there are differences between temperament dimensions of boys and girls between three to five years old. The sample includes 406 participants: 221 boys and 185 girls, from 9 pre-schools districts (Arequipa-Peru). The study was descriptive and correlational, trying to find the relationship between dimensions of temperament in boys and girls. The Buss and Plomin scale of temperament: emotionality, activity and sociability (shyness) (EAS), and a demographic card built by the researchers were used. Significant differences were found in favor of girls in the dimensions of sociability and activity. On the other hand, there are no significant differences in relation to the different ages of the participants.

**Keywords:** temperament, emotionality, activity, sociability, shyness, boys and girls

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## Introduction

Human behavior is influenced by numerous variables that act in different ways according to each person, the genetic endowment of the parents that facilitates the type of responses emitted by the human being and the parenting style of the parental figures are the main factors in the personality development of the human being.<sup>1,2</sup> Allport<sup>3</sup> referred that personality is the dynamic organization within the individual of the psychophysical systems that determine his characteristic behavior and thinking; character is the mark or stamp of a man, his set of characteristics, his life style, Europeans used to prefer the term instead of personality and temperament is a mental constitution or habit that depends especially on the physical constitution or is related to it. It is a kind of raw material with which the personality is constituted Izquierdo<sup>4</sup> Over time, the term character has ceased to be used, prevailing only the term personality and temperament, although it has not disappeared, when it is mentioned it is considered as a part of personality to refer mainly to the biological or constitutional bases of personality. It can be said that temperament has more biological roots and personality more social influence and that temperament refers more to the period of childhood and personality to adulthood. Since a few decades ago there are authors who are again renewing research on temperament, in the USA Thomas and Chess and Buss and Plomin and in Russia Teplov and Merlin.

Thomas and Chess<sup>5,6</sup> & Thomas et al.<sup>7</sup> made a great impact when they argued that the child was not a passive recipient of environmental influences, they showed that the child brought a number of genetic characteristics, such as temperament, which in turn influence the performance or impact of environmental pressures. Individual differences appear to be present from birth and are influenced, but not determined by postnatal experiences.<sup>8</sup> Studies with identical twins reveal a number of similar temperamental traits (activity level, sociability, shyness), with more similarities than fraternal twins and indeed other siblings despite shared environmental influences.<sup>9</sup> Generally in adulthood individual differences are conceptualized in terms of personality theories and traits, but in early childhood it is considered better to explain child behavior in terms of temperament.<sup>10</sup> It is claimed that there is correlation between various forms of temperament and characteristics of different personality types in adulthood, there is evidence supporting continuity between infant temperament and adult personality traits.<sup>11,12</sup>

Temperament has been considered in a variety of ways, but they all have in common the recognition that they are non-cognitive and non-motivational characteristics that can explain individual differences in people especially in childhood.<sup>13</sup> These characteristics appear early in the infant, are usually more or less stable and influence how they experience and interpret their world and how they react to their life experiences.<sup>14</sup> Temperament is thought to represent the inherited, neurochemical part that determines emotional reactivity to stimuli<sup>15,16</sup> state that temperament is conceptualized as the constitutional, relatively stable characteristics in the way human beings react in affect, activity and attention in their early stages. Strelau<sup>17</sup> refers that temperament is mostly related to emotions and therefore close to that proposed .

Nasvytiene and Lazdauskas<sup>18</sup> argue that temperament is the characteristic that emerges earliest in people and is relatively stable in the school years as it predisposes the child to interact with his or her environment in a particular and consistent way across diverse situations. The interest in the peculiar styles of functioning of the human species, especially the nature of emotional manifestations was present in Greek medicine. For Hippocrates there are four humors that influence the physiology and psychism of the person: the blood to which corresponds the sanguine temperament; the black bile that gave rise to the melancholic temperament; the yellow bile to the choleric temperament and; the phlegm that is related to the phlegmatic temperament. This ancient concept is somehow present in modern theories that propose the relationship between temperament and neurotransmitters. Kretschmer<sup>19</sup> described three morphological types: leptosome, a thin person; athletic, with good muscular development; and the pycnic, with a soft face and large belly. Later Sheldon also described three morphological types: the endomorph, similar to the picnic, with predominance of visceral activity; mesomorph, similar to the leptosome with predominance of conscious activity and; the ectomorph which corresponds to the athletic with predominance of muscular activity. Recently Cloninger et al.<sup>20</sup> have stated that the innate disposition of children called temperament is strongly influenced by more than 700 genes that regulate associative conditioning for molecular processing of synaptic plasticity, long-term learning and memory.

Although a definition of temperament accepted by all has not been achieved, it is common to accept that: temperament encloses mostly biological characteristics, they emerge in childhood and represent the

foundation of future personality, it is relatively stable over time, it can be modified by life experiences, such as educational practices, there are not only genetic influences but prenatal, perinatal and postnatal and, the best time to study it is in childhood.<sup>21</sup> Several questions about the stability of development have been considered important by research, it is believed that the temperament with which human beings are born has the possibility of maintaining certain stability over time. In this regard, Rutter<sup>22</sup> states that: Stability without variation, refers to the fact that a behavior learned early does not change or disappear over time, for example, eating with sticks, once learned is not forgotten, this kind of stability is not expected for the characteristics of temperament, it would be expected that the way of crying of a 5 year old child is similar to the way of crying when he was 2 months old. Stability as regular in a pattern of change, as shown in monozygotic or univiteline twins, their pattern of changes in the development of their intelligence is similar; understanding stability in this type of change is important in longitudinal studies with twin populations. Normative stability refers to the extent to which individuals maintain their relative position within a group over time, such as menarche and stature; most temperament characteristics exhibit normative stability. Ipsative stability, the term ipsative is used in psychology to indicate a specific type of assessment in which the respondent can only choose between two or more options. It refers to the regularity of a person's predominant characteristic reactions, e.g., predominant mood over time or temperament characteristics, such as intensity of emotional reactions. Stability of process or structure, mechanisms of possible behavioral transformations, is considered as a way of predicting from a measurement made in childhood to another characteristic measured in later stages demonstrating the continuity of the underlying process even though substantial changes have occurred, for example the temperament characteristic, negative emotionality assessed in childhood may be predictive of the measurement of shyness in youth since both, negative emotionality and shyness have similar underlying bases, therefore negative emotionality may be predictive of other characteristics in the future.

Temperament and its manifestations in children influence the parenting styles that parents use with them, if the child is irritable parents are also more impatient and use physical punishment more frequently since temperament implies a relationship that may have a greater relationship with the child's susceptibility to parental behavior, temperament may be an important factor in the perception that children have about their stressful experiences. Both individual differences in temperament and emotional relationships vis-à-vis parents may determine the reactivity of the stress and regulation system.<sup>23</sup> For many years there has been interest in knowing the origin of personality, it is mentioned that it may be the result of learning, the environment, the child's genes, the history of reinforcement or all these variables together. From birth children present great variability in the way they react to environmental stimuli, some children are fearful pay little attention, cry easily; other children are smiling, enjoy intense games, look for existing events and are not easily distracted, these reactions together with the mechanisms that regulate them constitute the temperament of children.<sup>24</sup>

### Contributions from thomas and chess

The research that contributed most to the revival of the concept of temperament was the work of Thomas and Chess who emphasized the innate aspect of behavior against the environmental theories in vogue. They did a longitudinal study over several decades observing the temperament of children finding nine separate qualities associated with personality and temperament. These qualities are: (a) level and extent of motor activity, the study of temperament has originated

different perspectives, but all have in common the acceptance that the concept refers to individual differences in the way of reacting and their emotional regulation therefore it is an inherited tendency and is present from early childhood; (b) approach/isolation, the level of energy and the capacity for novel responses to people or objects, the child accepts new experiences or does not reject them; (c) adaptation, the child's ability to adapt to changes imposed by the environment; (d) responsiveness, the degree of sensitivity to stimuli; (e) responsivity threshold, the threshold of response to stimuli; (f) rhythmicity, the degree of regulation in functions, e.g., feeding, elimination, sleep- wake cycle; (g) mood quality, the readiness to react with joy or displeasure, pleasure or anger, friendly or confrontational; (h) attention span persistence, degree of attention to persistence in an activity; and (i) distractibility, the degree to which the child is distracted from what he or she is doing. Subsequently, based on these nine qualities, it was found that certain characteristics could be grouped with each other, resulting in three final temperament types. Easy children are characterized by their positive mood, regularity in their bodily functions, low or moderate intensity in their reactions, adaptive capacity and positive approach to difficulties rather than rejection of new situations. In their early stages of development these children quickly establish regular sleeping and eating patterns, are generally cheerful and adapt quickly to new routines, different foods and new people, participate in new activities and adapt easily in school, generally present few problems to parental figures in their care and education;

Difficult children, characterized by irregularity in their bodily functions, intensity in their reactions in a constant manner, without great variations, relative slowness in adapting to environmental changes, generally negative mood, these children are generally irregular in their sleeping and eating rhythms, are slow to accept new foods, take a long time to adapt to new routines or activities and react easily with loud crying, They may react to frustrations with tantrums and therefore in general their parents require a high degree of consistency and tolerance in their upbringing, the characteristics of these children are present from birth, parents must face the irregularities and slowness seeking their adaptation with the family lifestyles, if parents are inconsistent, impatient or punishing in the management of the child is likely that the child reacts with greater negativity than other children, it is likely to take a long time to learn the rules to function better; Children who are slow to become enthusiastic, are relatively low in their activity level, tend to isolate or withdraw at the first exposure to new stimuli so they are slow to adapt to school, their mood is usually somewhat negative and the intensity of their responses or reactions are low, if the parents or teachers of these children pressure them to react quickly to new experiences or situations, it is likely that the insistence will only result in further withdrawal by its very nature, but nevertheless these children need to be encouraged and given the opportunity to face new experiences.

It is necessary to highlight the statements of Thomas et al.<sup>7</sup> related to the rejection of the concepts of environment versus nature. The researchers wanted to highlight the importance of the temperament that the child brings at birth and that is molded by the upbringing or environment in which he/she develops, shaping his/her personality. Their hypothesis states that personality is molded by the constant interaction between temperament and environment. Therefore, the course of the child's temperament is not immutable; in the course of his development, environmental circumstances can highlight, diminish or modify the reactions and behavior of an evolving child and described their approach as an attempt to distinguish or specify the how of the behavioral style of children in terms of their temperament, but it is

criticized because it does not state the why or does not seek to know the motivational aspects of behavior. Their model also specifies that mood is a continuum that goes from negative to positive, but for some researchers they are independent constructs, and the emotional factor as a component of temperament was not considered very important as the current research indicates Else-Quest et al.<sup>25</sup>

### Contributions from buss and plomin

Modernly Buss and Plomin<sup>26-28</sup> following the ideas identified three temperaments or traits which are the basic structures of personality: emotionality, activity and sociability. They argue that each personality is composed of different amounts of each factor or temperaments. The temperaments combine and form patterns or super-traits such as introversion or extroversion. For temperaments are basically inherited, so they do not change throughout the life cycle and there is little influence of learning derived from social interactions, although Buss and Plomin recognize the importance of environmental factors. When reality forces to deviate from the innate tendency for a long time, conflicts and stress arise. It is affirmed that there is a relationship between temperament dispositions and the five great personality factors. Later Buss and Plomin<sup>29</sup> when creating an instrument to measure the dimensions, included the dimension of shyness, although they pointed out that it can be included within the sociability dimension.

### Emotivity

It is the tendency to be physiologically aroused, easily and intensely, in the face of the three unpleasant situations: distress, anger and fear. Buss and Plomin<sup>27,28</sup> include three subfactors: tendency to distress (undifferentiated distress), disposition to anger, and disposition to fear. Infants aged 2 to 3 months exhibit behavioral patterns that include smiling, vocalizations, and limb motor movements more frequently in social and nonsocial contexts; these reactions tend to be positively related and called socialization, but are better categorized as positive emotionality. The set of reactions that can be denominated as positive emotionality, which are not present in the newborn, have only been adequately observed from 2 to 3 months of age and show a clear increase throughout the first year of life; negative emotionality such as irritability have been detected from 3 to 4 months of age and seem to be related to their sensitivity, lack of softness and tension.<sup>30,31</sup>

### Activity

They are related to energy and physical vigor, it has two conceptually different aspects, one is vigor considered as the intensity or amplitude of the person's behavior. Vigorous acts take a great amount of energy, they are expressed in two ways: looking for activities that comprise behaviors of great intensity or using a great amount of energy in what he/she does. The other aspect is time, the speed of one's activities, can also be expressed in two ways: choosing activities that involve speed of execution or doing activities quickly. Reports of activity stability have been observed from the fourth week and better from 4 months, but not from the birth period; activity intensity at 3 to 6 months predicts activity intensity at 11 to 15 months, it is possible that the level of activity at 12 months presents some future stability; it appears that active children direct more attention to their environment and inactive children direct their attention mostly to their own body.

### Sociability

It is the tendency to prefer to be with other people, to share with them, to receive their attention and to participate in activities with others. It does not mean receiving social reinforcements, these

reinforcements are accepted by all human beings, to be sociable is to intrinsically value the process of interacting with other people. Temperament theories differ in a few aspects, one of them being the number of dimensions that should be included within temperament, the differences are mostly based on whether it includes any type of behavior or whether certain behaviors considered basic are selected. Goldsmith and Rieser-Danner<sup>32</sup> state that there are a number of convergences on conceptualizations of temperament: (a) temperament includes several dimensions that are characterized by individual differences rather than universal developmental patterns; (b) temperament characteristics emerge in early childhood and are the basis for personality development; (c) temperament dimensions are relatively stable over time, studies provide support for long-term temperament stability; (d) it is possible that temperament dimensions have a biological (genetic) basis, (e) expressions of temperament characteristics may be shaped by parenting strategies of caregivers or others. In general all temperament researchers accept environmental influences, such as parental parenting practices, it is possible that environmental influences contribute to stability, as children's temperament may shape the experiences to which they are exposed. All children sleep, but differences are associated, for example, with movements or the positive or negative mood associated with sleep timing or regularity of sleep within other manifestations.<sup>33</sup> Temperament characteristics indicate how children under stressful situations do well, while others who experience mild stressful situations have difficulties. Some children are easy-going and may receive better care, others are demanding and impulsive and may create problems in their upbringing.<sup>34</sup>

### Temperament development

Temperament characteristics have been observed from birth including the fetal stage. Newborns show distress and avoidance movements; at the age of 2 to 3 months, smiles, laughter and body movements that seek approaches to others are evident; anger and frustration are seen at 2 and 3 months; fear in the form of physical inhibition are clear between 7 and 10 months. Rothbar<sup>35</sup> report that the most studied temperamental dimensions in newborns have been negative emotionality, activity level, distractibility, attention spans, and approach and withdrawal.

Studies of negative emotionality have found that newborns who maintain long periods of orientation to the surrounding environment tend to be infants who are less susceptible to distress and that irritability can be combined with excitability and rapidity of development, although there are cultural differences. A demonstration of stability in susceptibility to distress has been found in newborns followed up to 24 months, especially in the activities of feeding, sleeping, orientation, examiner calmness and the application of stressful stimuli. In the level of activity was considered as calm if the reaction lasted no more than 10 seconds and active if it lasted more than 25 seconds, it has been found that some babies show intense activity when the bottle is removed from their mouth; while calm babies continue sucking and fall asleep. When high levels of arousal activity are present in newborns they are frequently correlated with expressions of negative affect. Distraction and attention span as assessed by orienting and remaining responsive to visual stimuli, it has been found that infants who are alert and responsive to various visual stimuli also remain alert and responsive when interacting with their mothers during feeding periods, similarly in social engagement and social competence at 3 years of age. Approach and withdrawal, newborns not only react to internal and external stimuli, they also regulate their own experiences. It has been noted in newborns certain approaches associated with the presentation of low intensity stimuli, but if their reaction to high



intensity stimuli is clear, especially to visual and auditory stimuli plus if these are added or added and perhaps represent an adaptive combination of reaction and self-regulation of temperament, it is possible that their evaluation allows predicting inhibition rather than later approach.

Fear in infancy may predict general fearfulness and low aggression; anger predicts frustration and aggression; physical approaches are seen when motor development allows, usually between 4 and 6 months. Fear is a reactive dimension that is also related to regulatory components, although fear serves to inhibit approach and aggression can also serve to attract attention. The attentional control system allows greater flexibility in both inhibition (e.g., not eating a tasty dessert) and action (eating more necessary vegetables); likewise, this dimension allows for error detection and improved planning. At around 30 months, children already show some consistency and stability in the execution of certain activities. Puonti et al.<sup>36</sup> report that some of the temperament dimensions proposed by various authors correlate with the five major personality dimensions: control effort with conscientiousness; negative affectivity with neuroticism; extraversion with extraversion; affiliation with openness. Gartstein et al.<sup>37</sup> studied early temperament development in four cultures: Japan, the United States, Poland and Russia, and found that American and Polish children had higher rates of positive affectivity, sensitivity, approachability and verbal reactivity, and Japanese and Russian children had higher rates of fearfulness, with differences according to gender and age.

Brody<sup>38</sup> states that although biological differences play an important role in the differences between boys and girls, the researcher argues that cultural values and attitudes influence the development of temperament. In general when the demands of caregivers are in excessive conflict with the temperament characteristics of the child a great deal of stress is likely to be generated, this implies that both parents and teachers need to recognize or identify what a child can and cannot do. A high-activity child cannot be required to sit quietly on a journey of many hours; he or she will have to make periodic stops to get some activity. Another child who is very focused on an activity of his or her liking will be difficult to react positively to a first call. Understanding the temperament of the child is also crucial in school work, according to the temperament of the child, the teaching process and the way in which the interactions of the child with the teacher and the child with other children are presented must be adapted these researchers note that a group of children in their research did not fit into any of the three groups indicated of particular interest has been the study of temperament as a contributory variable in the occurrence of psychological problems, strong extroversion is related to externalized problems, with outwardly directed behaviors and few internalized problems (anxiety).<sup>39</sup> Angry temperament and frustrations is related to both externalized and internalized problems Sanson et al.<sup>40</sup> It is being accepted that temperament differences are good predictors of internalized or externalized problems in childhood and adolescence.<sup>41</sup>

## Temperament and gender

Temperament can be studied from different perspectives such as behavioral style, psychobiological style and biotypological style (sex differences). While differences are made between the term sex mostly referring to biological aspects (hormones, chromosomes, genitalia) to determine whether one is male or female, and the term gender to refer to social or cultural aspects.<sup>42</sup> When studying temperament and sex differences in children from 1 to 10 years of age, it was found that boys were more active, aggressive, irritable and less sociable than girls, accompanied by differences in the parenting system.<sup>43</sup> In

Brazil, children with normal development were studied and it was found that boys had higher ratings than girls in negative emotionality, impulsivity, activity and openness, while girls obtained higher ratings in the dimensions of fearfulness, cooperation and positive mood. Interestingly, found that there are significant differences when the assessment of temperament and gender are made by parents or teachers, for example, for parents, if the level of activity is high, it favors girls in their social competence, whereas if the level of activity in boys is high, it disfavors social competence; if irritability is high, it disfavors girls and favors boys. However, if the evaluation is made by teachers, there are few gender differences when considering the relationship between temperament and social competence.<sup>44</sup> For the present study, the term boy and girl or male and female will be used because of the way in which parents categorize them according to their biological characteristics, without differentiating between the terms gender and sex.

It has been suggested that the sex of children is a risk factor that emerges in development suggesting that sex plays an important role in the presentation of psychological health problems. Females outperform males on the dimension of control, while males outperform females on the dimension of activity and high intensity of satisfaction. Lahey et al.<sup>45</sup> report that there are differences between male and female infants from the first year of life to adolescence; in the fear dimension, boys showed fewer fears than girls; girls from 3 to 5 years of age scored higher than boys in fearful temperament, especially when faced with strangers; they also found a strong relationship between lack of parental care before 11 months of age and future behavioral problems in boys at 4 to 13 years of age. Boys with high levels of difficult temperament at age 4 years presented greater isolationist behavior and outward- directed behaviors than girls<sup>46</sup> found that boys tend to act with greater emotional volatility than girls and that girls respond with greater negative emotionality, but that they decrease more quickly than in boys.

Most theorists agree that temperament traits have a biological substrate and are heritable, they also agree that they are influenced by environmental or contextual factors, but the existence of gender differences has been inconclusive. But, although the presence of differences between boys and girls from birth is argued, research on 1-year-old boys and girls has shown few differences in temperamental characteristics and perhaps the few differences found are due to the effect of the home environment. Although research on temperament and gender exists, in our environment it is scarce, in Peru, Orihuela<sup>47</sup> when investigating 11-year-old boys and girls found no relationship between Buss and Plomin's temperament dimensions and resilience factors and refer that an important indicator of temperament continuity is the presence of different traits throughout life, differences that are already observed in childhood when observing temperament differences between boys and girls. The researchers examined temperament differences in young adolescent males and females, the study confirmed differences between males and females, but also differences according to the ages of the French participants. Females obtain better values in harm avoidance, reward dependence and cooperation, although only in self- direction was interaction between gender and age consistently found.<sup>48</sup> It has been reported that in Lima-Peru<sup>49</sup> the levels of negative affect and emotional control are better in girls than in boys. The subject of temperament in childhood has been little studied in our environment, the importance of this research, besides filling a gap in the area, lies in the fact that it will try to know the characteristics of temperament of our children between 3 and 5 years old.

## Method

### Participants

The research was conducted in the 8 most important districts of the city of Arequipa- Peru in which 32,530 students from 3 to 5 years of age were enrolled. Using Arkin and Colton's tables León and Montero<sup>50</sup> with a sampling error of + - 5%, the participants were 406, of which 221 were boys and 185 girls. Although the institutions were drawn by lot, the sample was by convenience.

### Instruments

#### Demographic data

This instrument was developed by the researchers to obtain relevant information about the participants and their families. The form consists of three parts: (a) data on the early education center, (b) data on the child, (c) data on the parents or guardians, (d) data on the family structure and dynamics.

Temperament Scale: Emotionality, Activity and Sociability (Shyness) (EAS)

Traditionally there is a certain consensus that this construct refers to individual differences in the reactivity and emotional regulation of each person and that it is a tendency of great biological content and therefore has continuity and temporal stability; therefore, temperament has two characteristics: heredity and its clear presence in early childhood. The EAS scale is the most widely used scale in studies that focus on the characteristics of early-appearing manner of being. The basic dimensions that it evaluates are: (a) emotionality or tendency to become easily and intensely activated (items 2, 6, 11, 15, 19); (b) activity, the preference for displaying a certain level of activity and speed of action (items 4, 7, 9, 13, 17); (c) sociability, the tendency to prefer the presence of other people or to remain alone (items 3, 5, 10, 16, 18). (b) shyness, the tendency to be inhibited in new social situations, this last characteristic is usually considered within sociability (1, 8, 12, 14, 20). It consists of 6 inverted items, 7, 8, 12, 16, 17 and 20. The items, although mainly applied to children, can be used with adolescents and adults. The scale is answered by mothers regarding their children's behavior. Each of its components is evaluated by 5 items with a total of 6 reverse items.

The inter-rater reliability and internal consistency is satisfactory: Cronbach's alpha.78. The validity of the version used in the present investigation was carried out in Spain by Bobes et al.<sup>51</sup> They found by the Cronbach's Alpha method: 0.51 for the total scale; 0.62 for the Emotionality subscale, 0.62 for the Activity subscale; 0.68 for the Shyness scale and 0.31 for the Sociability subscale. Walker et al.<sup>52</sup> conclude that the EAS has acceptable internal consistency and that its predictive and concurrent validity is good. Therefore, it is reliable and useful for the measurement of temperament in childhood and that it is suitable for research, including genetic and longitudinal research in Spanish-speaking countries. In the present study the Cronbach's Alpha statistic calculation of our database was 0.69 for the emotionality dimension, 0.52 on the activity dimension, 0.46 on the sociability dimension, 0.51 on the shyness dimension, and 0.47 on the total scale.

### Procedures

The early education centers in the districts were randomly selected according to: (a) they had children 3, 4 and 5 years old, and (b) they had the cooperation of the management and teaching staff; the benefit of knowing how their children function was emphasized, which will facilitate their education. Before initiating the definitive research, the two instruments were applied as a pilot test to 15 participants,

in order to make any necessary readjustments in the administration as well as in the scoring and interpretation of the vocabulary used and its comprehension. The instruments were sent to and answered by the mothers or maternal figures through the teachers, with an introductory message to motivate their participation. Both mothers and teachers were promised and complied with the promise to send them the results, attaching a series of guidelines on parenting and education strategies with their children. Satisfactorily, a return rate of 74% was obtained, much higher than what is usually reported. Once the data were collected, the respective qualification and interpretation was performed. The SPSS Statistics 24.0 program was used for data analysis with the assistance of a statistician.

## Results

The following results are presented in tables with their respective frequencies, percentages and, when possible, results of the chi-square statistical test.

According to Table 1 on temperament dimensions and sex, it can be observed that girls are more emotional than boys (3.7% vs. 1.7%); more sociable than boys (14.3% vs. 7.6%) and more active than boys (31.3% vs. 30.5%); however, boys are more shy than girls (5.7% vs. 5.2%). Table 1 shows that there are only statistically significant differences ( $p > 0.05$ ) in sociability and activity in favor of girls. In shyness and emotionality the differences are not significant.

**Table 1** Differences in the dimensions of temperament according to sex

Cross table of dimensions and sex			Sex		
			Girls	Children	Total
Dimension	Shyness	Count			
		% within Sex	5,2%	5,7%	10,9%
	Emotionality	Count			
		% within Sex	3,70%	1,7%	5,4%
	Sociability	Count	58		
		% within Sex	14,3%	7,6%	21,9%
	Activity	Count			251
		% within Sex	31,3%	30,5%	61,8%
Total		Count			406
		% Within Sex	54,5%	45,5%	100,0%

Shyness:  $\chi^2$  ,267  $p > 0.05$ ; Emotionality:  $\chi^2$  ,150  $p > 0.05$ ; Sociability:  $\chi^2$  ,026  $P < 0.05$ ; Activity:  $\chi^2$  ,0306  $P < 0.05$

Table 2 shows that in the dimension of shyness, at 3 years of age, boys present a higher dimension of shyness than girls (69.4% vs. 31.6%); at 4 and 5 years of age, girls are the ones who present a dimension of shyness with higher percentages 54.5% and 64.3% of girls versus 45.5% and 35.7% of boys. In Emotionality in all ages, girls have higher percentages in the emotionality dimension than boys (66.7%; 57.1% and 77.8% of girls versus 33.3%, 42.9% and 22.2% of boys). In Sociability, as in Emotionality, at all ages girls have higher percentages in the sociability dimension than boys (69.2 %, 58.3 % and 66.7 % of girls versus 30.8 %, 41.7 % and 33.3 % of boys). In Activity at age 3, girls present higher percentages than boys in the activity dimension (56.8 % of girls vs. 43.2 % of boys); at age 4 there are no differences between boys and girls (50.0 % vs. 50.0 %) and at age 5, girls present lower percentages than boys in the activity dimension (46.3 % vs. 53.7 %).

**Table 2** Temperament dimensions according to age and sex of the participants

Dimensions				Age in Years		
				Three years	Four years	Five years
Shyness	Sex	Girls	Count			
			% within Age in years	31,6%	54,5%	64,3%
	Children	Count		5	5	
		% within Age in years	68,4%	45,5%	35,7%	
	Total	Count				
		% within Age in years	100,0%	100,0%	100,0%	
Emotionality	Sex	Girls	Count			
			% within Age in years	66,7%	57,1%	77,8%
	Children	Count				
		% within Age in years	33,3%	42,9%	22,2%	
	Total	Count				
		% within Age in years	100,0%	100,0%	100,0%	
Sociability	Sex	Girls	Count			
			% within Age in years	69,2%	58,3%	66,7%
	Children	Count				
		% within Age in years	30,8%	41,7%	33,3%	
	Total	Count				
		% within Age in years	100,0%	100,0%	100,0%	
Activity	Sex	Girls	Count	42		
			% within Age in years	56,8%	50,0%	46,3%
	Children	Count				
		% within Age in years	43,2%	50,0%	53,7%	
	Total	Count		82	95	
		% within Age in years	100,0%	100,0%	100,0%	

Table 3 shows that in the dimensions shyness, emotionality, sociability and activity, the percentage of counts is lower than the expected value and  $p > 0.05$ , which means that in none of the temperament dimensions there is a significant relationship between the temperament dimensions and the ages of the participants.

**Table 3** Temperament dimensions and participants' ages

Age temperament	Dimensions							
	3 years		4 years		5 years		Totals	
	N	%	N	%	N	%	N	%
Shyness	19	4,7	11	2,7	14	3,4	44	10,8
Emotionality	6	1,5	7	1,7	9	2,2	22	5,4
Sociability	26	6,4	24	5,9	39	9,6	89	22,0
Activity	74	18,2	82	20,2	95	23,4	251	61,8
Total	125	30,8	124	30,5	157	38,7	406	100

Timidez:  $X^2, 155$   $p > 0,05$ ; Emocionalidad:  $X^2, 697$   $p > 0,05$ ; Sociabilidad:  $X^2, 697$   $p > 0,05$ ; Actividad:  $X^2, 416$   $p > 0,05$

Table 4 shows that 240 participants (71.7%) have mothers with higher education; 20 participants (6.0%) have mothers with incomplete higher education; 39 (11.6%) have mothers with technical education; 35 (10.4%) have mothers with secondary education and only one mother with elementary education. If all the percentages of mothers with higher education are added, the percentage is 78.9% of mothers with some level of higher education. Although, the percentage count is less than the expected value, also  $p > 0.05$ , which means that there is no significant relationship between the temperament dimensions and the educational level of the mothers.

**Table 4** Dimensions of temperament and educational level of mothers

Educational level	Dimensions									
	Shyness		Emotionality		Sociability		Activity		Total	
	N	%	N	%	N	%	N	%	N	%
Superior	16	4,8	11	3,3	49	14,6	164	49,0	240	71,7
Sup Incomplete	1	0,3	1	0,3	6	1,8	12	3,6	20	6,0
Technician	4	1,2	2	0,6	9	2,7	24	7,2	39	11,6
Secondary	8	2,4	7	2,1	9	2,7	11	3,3	35	10,4
Primary							1	0,3	1	0,3
Total	29	8,7	21	6,3	73	21,8	212	63,3	335	100,0

Lost 71

Higher:  $X^2, 817 p>0.05$ ; Higher Incomplete:  $X^2, 535 p>0.05$ ; Technician:  $X^2, 832 p>0.05$ ; Secondary:  $X^2, 381 p>0.05$

As can be seen in Table 5 on temperament dimensions and the degree of education of the fathers, it can be seen that 259 participants (79.0%) have fathers with higher education; 07 participants (2.1%) have fathers with incomplete higher education; 35 (10.7%) have fathers with technical education; 26 (7.9%) with secondary education and only one father with elementary education. If we add the

percentages of fathers with some level of higher education, these reach 91.8%. As with the mothers, the percentage count is less than the expected value, also  $p> 0.05$ , so there is no significant relationship between the temperament dimensions and the educational level of the fathers.

**Table 5** Dimensions of parental temperament and educational level of parents

Educational level	Dimensions									
	Shyness		Emotionality		Sociability		Activity		Total	
	N	%	N	%	N	%	N	%	N	%
Superior	17	5,2	11	3,4	54	16,5	177	54,0	259	79,0
Sup.Incomplete		2,1	2	0,6	1	0,3	4	1,2	7	
Technician	6	1,8	3	0,9	10	3,1	16	4,9	35	10,7
Secondary	5	1,5	4	1,2	8	2,4	9	2,7	26	7,9
Primary		0,3	1	0,3					1	
Total	28	8,5	21	6,4	73	22,3	206	62,8	328	100

Missing Values = 78

Higher:  $X^2, 991 p>0.05$ ; Higher Incomplete:  $X^2, 323 p>0.05$ ; Technician:  $X^2, 980 p>0.05$ ; Secondary:  $X^2, 155 p>0.05$

Table 6 shows that 25.9% of the participants come from nuclear families and the great majority, 61.0%, from extended families; in other cases, only 13.1%. It is necessary to clarify that extended families are formed by the presence of both parents and other relatives. The percentage counts are lower than the expected value ( $p>0.05$ ), which means that there is no significant relationship between the

temperament dimensions and coming from extended nuclear families or others. The temperament dimensions, activity and sociability, are the most associated with extended families (activity: 63.4 %; sociability: 22 %) and similarly with nuclear families (activity: 59.7 %; sociability 21.9 %)

**Table 6** Temperament and family structure dimensions

Family structure dimensions	Dimensions									
	Shyness		Emotionality		Sociability		Activity		Total	
	N	%	N	%	N	%	N	%	N	%
Nuclear	10	11.5	6	6.9	19	21.9	52	59.7	87	25.9
Extended	17	8.3	13	6.3	45	22	130	63.4	205	61
Others	3	6.8	4	9.1	6	13.6	31	70.5	44	31.1
Total	30	8.9	23	6.9	70	20.8	213	63.4	336	100

Missing values =70 Nuclear:  $X^2, 999 p>0.05$ ; Extended:  $X^2, 426 p>0.05$

## Discussion

We set out to investigate whether children from 3 to 5 years of age present different dimensions of temperament than girls of the same ages. The approach was partially verified as shown in Table 1, only in the dimensions of sociability and activity there are significant differences in favor of females and in the dimensions of emotionality and shyness there are no significant differences. It is accepted that the

research contributions emphasized the innate aspect of temperament and its influence on personality development, contrary to the prevailing environmental theories to date. The present study is of a biotypological style between boys and girls and its results are, in turn, similar and different to other investigations, thus, they follow the same line that states that females are more sociable than males, as also found by Lahey et al. (2008) who found that females outperformed males in the dimension of control associated with sociability, but,



unlike the findings of the present research, they also found that males outperformed females in the dimension of activity, although these different results are striking, if the difference is analyzed by age (Table 2) it is observed that it is at the age of three years where females outperform males, at 3 years the levels are similar and at

4 years males outperform females. It is possible that girls, as they have better development than boys, seem more active, but, with time, boys surpass them in being more active. In any case, the present findings, where girls significantly outperform boys, raise important questions related to the influence of the genetic factor, although it is possible that the dimensions found in both groups are genetically influenced, the difference between boys and girls may be influenced by the parenting styles that are more popular in current times.

The results on age are interesting (Table 2), regarding the shyness dimension, at 3 years of age the boys are more shy than the girls, but, at 4 and 5 years of age the girls become more shy than the boys, that is, as they get older they become more shy: at 3 years of age 31.6 %; 4 years 54.5 % and at 5 years 64.3 %. On the other hand, in children the process is the other way around, the older they get the less shy: 3 years 68 %; 4 years 45.5 %, at 5 years 35.7 %, there is the possibility of being influenced by the upbringing. In the emotionality dimension, girls are more emotional than boys in all the ages studied and although the differences are not significant, they are important in percentage terms: at 3 years of age: girls 66.7% vs. boys 33.3%; 4 years of age: girls 75.1% vs. boys 42.9%; at 5 years of age: girls 77.8% vs. boys 22.2%; in this dimension, the genetic influence seems to be clear.

In the sociability dimension, girls are superior at all ages; but, in the activity dimension, as noted in previous paragraphs, only at 3 years old girls are more active than boys (girls: 56.8% vs. boys: 43.2%); at 4 years old: girls and boys present the same percentage (50.0% vs. 50.0%); but at 5 years old boys are more active (53.7%) than girls (46.3%), it is noteworthy found that boys at 4 years of age presented more outward-directed behavior (activity) than girls.

The results of the present research are apparently highly controversial, but they follow the line of what stated that although temperament has biological roots it is also influenced by environmental factors, fundamentally by the new trend of raising boys and girls without major differences; therefore, they seem to be right when they stated that the existence of temperament differences according to sex is not very conclusive.

It should be recalled that considers temperament as the biological or constitutional basis of personality that has more social influence and that temperament is a concept more applied to childhood and personality to adulthood and that current research on temperament and its conceptualization is not free of controversy. When we tried to assess the relationship between the ages of the participants and the temperament dimensions (Table 3), it is noticeable that the activity dimension is the one with the highest presence at 3, 4 and 5 years of age, but, although the percentage values are much higher, they are not statistically significant. The other dimension that predominates in the participants is sociability, but in this, as in none of the other dimensions, there are significant differences in relation to age. Temperament characteristics should be taken into account by the people who raise or educate children, in the present research 10.8% show shyness, a dimension that makes them vulnerable to fears, although the percentages are low it is necessary to take them into account so that unnecessary fears are not taught, it is known that most fears are learned and can be generalized in the future, although certain fears serve to inhibit the approach to potential dangers. Emotionality (5.4 %) is associated with irritability, anger, frustration that derive in

possible anger and aggression; it should be taken into account that around 30 months of age children already show certain consistency and stability in the execution of certain reactions. As shown in Table 3, a large number of children are active (61.8%) and sociable (22.0%) very important characteristics at the age when children attend early education, therefore, all educational programming should take into account these characteristics, also at home, it is easy for them to be excessively engaged in activities provided by technological advances that if not properly used are to the disadvantage of child development.

Therefore, the demands and challenges faced by caregivers are in conflict with the temperamental characteristics of infants, which generates stress that requires teachers and parental figures to identify what a child can and cannot do. A high-activity child cannot be required to sit quietly in his or her work folder or remain in one corner for many minutes, especially in activities that are not of interest to him or her. Knowing and understanding children's temperament is important in school work, in how he or she should interact with teachers and peers in early education. It is interesting that the educational level of both mothers 89.3% and fathers 91.8% is at a higher level, which is unusual in relation to the educational level of the Peruvian population. However, it is noteworthy (Table 4 and Table 5) that, of these percentages, 78.9% for mothers and 80% for fathers are associated with the dimensions of activity temperament and sociability of their children. It is possible that the good educational level in these families favors the development of these dimensions that can be considered positive for the development of human beings in their initial stages.

The predominant structure of the families in the sample studied is the extended family, 61.0 % followed by the nuclear family 25.9 %, although it is important to point out that extended families are formed by the presence of both parents and other relatives, generally grandparents and uncles; other diverse forms 13.1 %. The temperament dimensions of activity (63.4 %) and sociability (22.0 %) are the most frequent in extended families; similarly in nuclear families the dimension of activity (59.7 %) and the dimension of sociability (21.9 %) are the most frequent. Although in Western culture the nuclear family is the predominant one, in our culture, due to the influence of our ancestors, the extended family is the most frequent. Therefore, it can be affirmed that the participants in the sample studied generally live in a family environment that can more easily provide them with emotional support and security. Only in the dimensions of sociability and activity are there significant differences in favor of girls. In the dimensions of emotionality and shyness there are no significant differences between boys and girls.

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## Conflicts of interest

The author declares there are no conflicts of interest.

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