

**TEACHERS' REPORTS ON STUDENT'S PERSONALITY
PROFILE: Validity and Reliability of School-Age
Temperament Inventory**

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This study aimed to assess the reliability of the Teacher School-Age Temperament Inventory (T-SATI) in a Caribbean context. A principal component analysis using varimax rotation was performed on data provided by 16 teachers who reported on 163 elementary school students. The results from the study supported four temperament dimensions which could be described as representing negative reactivity, task persistence, distractibility, and withdrawal. Cronbach alphas for the dimensions ranged from .774 to .920. The T-SATI can provide teachers with the means of recognizing the temperament of students so that teachers can better select behavioural management strategies in providing goodness-for-fit classroom context for children.

Introduction

In a single class, teachers are likely to encounter children with different dispositions who respond to the same situations differently. They are likely to find children who are sociable, easy going or, conversely, easily distressed and upset, as well as children who have difficulty following directions, getting along with others or controlling negative emotions, such as anger and distress (Goldsmith, Lemery, Aksan, & Buss, 2000; Raver, 2003; Zentner & Bates, 2008). These individual characteristics may influence teachers' perceptions of children's academic ability and their classroom management strategies (Bogges, Griffey, & Housener, 1986; Hughes & Coplan, 2010). According to Lyons-Thomas and McClowry (2012), "responsive teachers understand that the individual characteristics of their students' influence their classroom-related behaviour in a multitude of ways" (p. 25). A student's temperament contributes to the complexity of classroom management in the teaching-learning process. Classroom teachers must be equipped to identify the variations in students' temperaments to effectively respond to the various

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situations in the classroom. The Teacher School-Age Temperament Inventory (T-SATI) provides teachers with a tool for knowing and understanding their students' behaviours and decreases the likelihood of the teachers merely reacting to students' actions through their perception as teachers. The purpose of this study is to examine the validity and reliability of the Teacher School-Age Temperament Inventory (T-SATI) in a Caribbean context. The results of this study will ultimately assist researchers and teachers in gaining a better understanding of children's characteristics, and serve to enhance behavioural management strategies in the Caribbean classroom.

Student temperament is one attribute that contributes to the variations in classroom behaviour. Temperament has been defined as "early developing individual differences in tendencies to experience and express emotions" (Goldsmith et al., 2000, p. 2). Other authors (McClowry, 2014) define temperament as "the consistent reaction style that a child demonstrates across a variety of settings and situations, particularly those that involve stress or change" (p. 3). The concept of temperament is used to describe the early development of personality. An individual's temperament, which is the early appearance of individual differences in reactivity and self-regulation, will eventually evolve into personality as the individual grows and matures (Berk, 2014; Rothbart, 2007). Rothbart (2007, p. 207) explains that "temperament and experience together 'grow' a personality, which will include the child's developing cognitions about self, others, and the physical and social world, as well as his or her values, attitudes, and coping strategies". Therefore, the experiences that children's environments provide, can have a profound effect on their ability to regulate and control their behaviour as they grow older. So, while temperament narrowly defines consistencies that appear earlier in life, personality defines a broader range of consistencies that emerge later in life (Shiner & DeYoung, 2011).

Temperamental characteristics are related, in predictable ways, to how children perceive and react to their environments (Rothbart, Ahadi, & Hershey, 1994). Several researchers have identified distinct categories or dimensions of children's temperament (De Pauw, Mervielde, & Van Leeuwen, 2009; Keogh, Pullis, & Cadwell, 1982; Rothbart, Ahadi, & Evans, 2000; Rothbart & Mauro, 1990). Drawing on Thomas and Chess' (1977) work, Rothbart et al. (2000), and Rothbart and Mauro (1990) highlighted the following dimensions: activity level, fear, irritability, effortful control, positive affect, and attention span/persistence. De Pauw et al.'s (2009) analysis generated six dimensions: sociability, activity,

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conscientiousness, disagreeableness, emotionality, and sensitivity. Zentner and Bates (2008) included emotion regulation as a component of temperament. Several studies have demonstrated that young children vary in their ability to regulate their emotions (Chess, 1990; Goldsmith et al., 2000; Raver, 2003; Zentner & Bates, 2008). Rothbart's (2007) definition of temperament also included individual differences in emotional reactivity. Rothbart (2007) expanded her definition to include differences in "motor, and attentional reactivity measured by latency, intensity, and recovery of response, and self-regulation processes such as an effortful control that modulates reactivity" (p. 207). These descriptors allow for the understanding of individual differences.

Temperament is shaped both by heredity and the environment. Several authors have discussed the biological bases of temperament (Auerbach, Faroy, Kahana, & Levine, 2001; Lyons-Thomas & McClowry, 2012; Posner, Rothbart, & Sheese, 2007; Rothbart, 2007). These results give support to the stability of an individual's temperament and the likelihood that temperament is a persistent characteristic. While there is some evidence for the biological basis of temperament, it is important also to recognise that children's environments may serve to enhance their ability to regulate their temperamental dispositions. Given this, it is imperative that educators understand that the goal of dealing with children's misbehaviours is not to change children's temperament but rather to assist children in learning to manage their temperamental dispositions so that the negative reactivity of their temperament does not overwhelm their interactions with others, but instead enhances their positive attributes.

Given differences in temperament, it is difficult to reach all students with a single approach. The goodness-of-fit model purports that the classroom and school environments should be adaptable to children's differences (Berk, 2014). Difficult children who withdraw from new experiences and have strong negative reactions frequently experience the poor-fit environment. Lyons-Thomas and McClowry (2012), however, noted that "responsive teachers understand that the individual characteristics of their students influence their classroom-related behaviour in a multitude of ways" (p. 25). It is also important to note that children's early academic and social success during early childhood is essential for their long-term success (Alexander, Entwistle, & Dauber, 1993; Hamre & Pianta, 2001). For example, some research has suggested that the teacher-student relationship is a unique predictor of academic and behavioural outcomes in early elementary school, which persists through the eighth grade (Hamre & Pianta, 2001). Orne and Jones (2009) found

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that a reactive temperament has a high, positive correlation with conflict in the teacher-student relationship. The quality of the teacher-student relationship does affect the students' school adjustment. Al Hendawi (2013) reviewed 71 studies with the goal to examine the role of temperament in academic achievement and school adjustment. His examination revealed that children's temperament had a significant relationship with school adjustment, such that, children with high levels of negative emotionality were more likely to exhibit inappropriate behaviours, and to experience difficulties regulating their emotions in response to the demands of the classroom context (Al-Hendawi, 2013).

In identifying students' temperament, teachers are able to plan their classroom management behaviour strategies more adequately by anticipating the aspects of their students' behaviour that are likely to be problematic for individual students and, thereby, tailor their behavioural management strategies to minimise behavioural problems and maximise learning in the classroom (Lyons-Thomas & McClowry, 2012). Teachers' assessments of their students' temperaments are largely influenced by their perceptions rather than their understanding of students' strengths and constraints (Lyons-Thomas & McClowry, 2012). For example, teachers who perceive children as disengaged, tend to rate their academic skills as lower than their peers, regardless of their actual performance (Hughes & Coplan, 2010). In fact, there are few differences between shy children and their non-shy peers in performance on standardised assessments of academic skill development, yet significant differences are found in teacher reports (Hughes & Coplan, 2010). As early as kindergarten, teachers expect their students to participate in classroom activities and to interact socially with their peers. Instead, shy children, for example, are reluctant to volunteer or answer questions, and often are not assertive in their interactions with peers and adults (Rudasill & Konold, 2008). The bashfulness of temperamentally shy children, results in less behavioural engagement in the classroom compared to their peers. Behavioural engagement refers to students' effort, persistence, concentration and interest in classroom activities (Skinner, Kindermann, & Furrer, 2009). Shy children may be perceived as having lower levels of behavioural engagement and the cause for lower levels of academic skills (Hughes & Coplan, 2010). The demands of the school environment can exacerbate shy children's social reticence and self-consciousness, inhibiting their behavioural engagement (Evans, 2001). It is clear that, because of their inherent characteristics, not all children enter school with an equal opportunity to succeed. Some characteristics of children may either

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promote or hinder children's success in school (Curby, Rudasill, Taylor, & Pérez-Edgar, 2011).

Given the long-term effects that teachers' responses to children can have on their behavioural and academic outcomes, it is imperative that teachers are able to understand and identify children's temperament (Lyons-Thomas & McClowry, 2012). Information on temperament can provide teachers with a framework for interpreting the behavioural styles of their students, assisting them to identify classroom management strategies which create a goodness-of-fit environment that is conducive to all their students' temperaments. Another advantage of teachers being able to recognise and adapt to children's temperaments is that such knowledge will aid teachers in counselling each child in the classroom, more from a position of understanding, and less from a position of biases caused by faulty perceptions that teachers may have.

Measurements of Children's temperament

Given the importance of temperament, valid, and reliable measures of temperament must be developed to facilitate teachers' assessment and understanding of their students (McClowry, 1995). Generally, assessment of children's temperament is usually obtained by asking parents to rate their children's behaviours or through observation of children in laboratory settings (Lo, Vroman, & Durbin, 2015; Zentner & Bates, 2008). Few temperament questionnaires solicit ratings from teachers. Thomas and Chess (1977) developed a 64-item Teacher Temperament Questionnaire (TTQ); this was the earliest rating instrument of children's behaviour by teachers (Keogh et al., 1982). Keogh et al. (1982) reduced the TTQ instrument to 23 items. This reduction of items resulted from the administration of the original TTQ scale to a sample of 300, 3 to 6-year-old children who were rated by 35 teachers. The study was conducted in preschools in the Los Angeles area ((Keogh et al., 1982). The factor analysis of this abridged instrument yielded the same three factors with eight dimensions. The result is similar to the factors of the original TTQ scale: task-related factors (persistence, distractibility, and activity), personal social flexibility (adaptability, approach-withdrawal, and positive mood-related to social situations), and reactivity (intensity of response, the threshold of response, and quality of mood). When the items using the abridged scale were grouped and tested, the three factors were .94, .88, and .62, respectively.

McClowry (1995) developed a teacher-based measure of temperament by modifying an existing parent measure of temperament

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that she developed in 1995, the School-Age Temperament Inventory (SATI). Like the SATI, the Teacher School-Age Temperament Inventory (T-SATI) consists of four sub-scales, which respectively measure negative reactivity, approach/withdrawal, task persistence, and activity. The results from the principal component analysis and the Cronbach Alpha gave support to the validity of the T-SATI scale. The explained variance of 70% was further supported by the Cronbach alphas of .90 to .96. The testing of the T-SATI involved 143 regular education teachers who rated the behaviour of 261 students. These students came from 27 elementary schools in the United States. Seventy-one percent of the teachers worked in public schools, while 19% of the teachers indicated that they were at private schools (Lyons-Thomas & McClowry, 2012). While research in North American contexts is valuable, the unique social context of the Caribbean necessitates the assessment of the psychometric properties of all measures. The purpose of this article is to examine the reliability and structure of the T-SATI within a Caribbean context for the first time

Research Questions

- Are there four dimensions which underlie the T-SATI scale in a sample of Caribbean pre-schoolers?
- Does the T-SATI demonstrate adequate reliability in a sample of Caribbean pre-schoolers?

Method

Participants

Participants in the study included 160 students and their 16 teachers. Six primary schools and approximately seven infant schools located in both urban and rural participated in the study. The sample consisted of 5-year-olds and grade one students in selected primary and infant schools. In Jamaica, the 0-6 years are classified as early childhood. The children who participated in this study are within this age group (5 & 6 years old). Though 5- and 6-year-old children may be able to exhibit more self-control than a toddler - for example, sitting and listening to a teacher in the classroom for a set time period - they are still early in their character development (Berk, 2010). The schools were selected based on accessibility by the research assistants. The students attended public schools located in low income areas of the selected urban area. The procedure for selecting the participating students was as follows:

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- For each class, the names of the students were obtained on the first visit. After this visit, 10 students (5 boys and 5 girls) were selected to take part in the study by using simple random sampling.
- The classroom teacher for the 10 selected children within each class was responsible for completing the temperament profile on each child. At the start of the study, research assistants were provided with the names of the sampled students. There were two research assistants in each classroom.

Measures

Teacher School-Age Temperament Inventory (T-SATI). The T-SATI is a teacher based measure designed to assess student temperament. It is an adaptation of the parent report SATI developed by McClowry in 1995. The T-SATI is designed to assess the following 4 dimensions of a child's temperament: negative reactivity, task persistence, withdrawal, and motor activity. Teachers are asked to rate children on the 4 dimensions of temperament based on their assessment of the classroom behaviour of each child. The scale consists of 36 items rated on a 5-point Likert-type scale (ranging from *never (0) to always (5)*) (Lyons-Thomas & McClowry, 2012). The T-SATI took approximately 10 to 15 minutes to complete. Past research (Lyons-Thomas & McClowry, 2012; McClowry et al., 2013) has suggested that the T-SATI has adequate internal consistency reliability with Cronbach's alpha scores for the T-SATI dimensions ranging from .70 to .96.

Procedures

Once permission was granted to access the school by the principal, and classroom teachers signed their informed consent forms to participate, parents were recruited. The recruitment of parents involved sending letters, making telephone calls, and conducting brief presentations at parent meetings. Concerning the T-SATI scale, parents who agreed to participate also signed an informed consent form.

Four research assistants administered the instrument. Teachers verbally responded to the questionnaire. Before the implementation of the study, teachers complained that they did not have the time to sit and answer 10 questionnaires for ten students as each questionnaire was estimated to take 10 minutes (10 x 10 minutes = 1 hr. 40 mins.) to complete (McClowry et al., 2013). The estimated time of 10 minutes for completing a questionnaire was reported by McClowry, developer of the instrument. Once the recruiting and selection of teachers and parents were completed, teachers were told that the items were not about a child's one-off response

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to a situation of stress or change, but to the consistent reaction style that the child typically exhibits across some situations and settings. These situations could involve stress or change across contexts. The situations could be in the classroom or on the playfield. The key word was consistent.

Data Analysis

A series of principal component analyses, using varimax rotation, was conducted to explore and confirm the structure of the T-SATI using SPSS ver. 21. Several criteria were used to determine the number of components to retain. These criteria included eigenvalues greater than 1. An inspection of the scree plot of eigenvalues shows retention of at least 30% of the total variability among items, factor loadings of 0.30 or greater, simple structure, and psychological meaningfulness of the components. In addition, a parallel analysis was conducted to identify the number of components to keep. In the parallel analysis, the eigenvalues created from a PCA conducted on a set of random data were compared to the eigenvalues found in the PCA. Components whose eigenvalues were greater than those found in the parallel analysis of random data were retained. Scores on each derived component were created by summing scores on the items that made up each component. These component scores were then correlated with each other.

Ethical Considerations

Ethical approval for this study was obtained from The University of the West Indies Ethics Committee, and informed consent was received from all participating parents and teachers.

Results

Principal Components Analysis

Both the qualitative criteria and the parallel analysis suggested that five components should be retained. However, the fifth component contained only two items, of which the reliability was low. Raubenheimer (2004) notes that “the usual case is that a minimum of three items must load significantly on each factor in a multidimensional scale” (p. 60). As such, a four-component solution was explored. This analysis retained a little more than half of the total variability (52.7%) underlying the items. According to Merenda (1997), this level of total variability is acceptable.

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He stated that, “Whether the determination is made from the original or the rotated factor or component matrix, the proportion of total variance will be the same, a rule of thumb to follow is that for the number of “real” factors or components , the proportion should be at least .50 [50%](p. 158).The four-component solution resulted in four clear components which could be labelled negative reactivity, distractibility, withdrawal, and task persistence (Table 1). Two items (“Smiles or laughs with new adult visitors” and “Approaches children his/her age even when he/she doesn’t know them”) did not load on any component. Inspection of the items suggested that the distractibility and task persistence items were grouped such that the task persistence items were positively worded and the distractibility items were negatively worded.

Table 1. Rotated component loading matrix from the four component principal components analysis without the motor activity items

Component	1	2	3	4
T31 When angry, yells or snaps at others.	.784			
T33 Gets mad even when mildly criticized.	.762			
T5 Gets angry when teased.	.761			
T29 Responds intensely to disapproval (shouts, cries, etc.).	.761			
T12 Reacts strongly (cries or complains loudly) to a disappointment or failure.	.736			
T27 Makes loud noises when angry (slams doors, bangs objects, shouts.)	.722			
T22 Moody when corrected for misbehavior.	.683			
T6 Gets upset when there is a change in plans	.665			
T3 Gets upset when he/she can't find something.	.638			
T25 Has off days when he/she is moody or cranky.	.600			
T17 Gets very frustrated when he/she makes a mistake.	.599			

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T16	Quits routine classroom assignments before finished.	.862	
T32	Leaves own projects unfinished (drawings, written work, models).	.838	
T26	Has difficulty completing assignments.	.812	
T2	Does not complete seatwork unless reminders are given.	.742	
T8	Switches from one activity to another before finishing the first.	.714	
T28	Avoids (stays away from, doesn't talk to) new guests or visitors in the school.		.819
T1	Is shy with adults he/she doesn't know.		.715
T30	Seems uncomfortable when meeting a new student for the first time.		.655
T23	Seems nervous or anxious in new situations.		.653
T14	When meeting new children, acts bashful.		.653
T20	Prefers to play with someone he/she already knows rather than meeting someone new.	.448	
T7	Smiles or laughs with new adult visitors.		
T21	Goes back to the task at hand after an interruption		.801
T18	Stays with seatwork until finished.		.760

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T13	Remembers to do assignments without being reminded.				.723
T10	Returns to responsibilities (written work, projects) after an interruption.				.692

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A third principal components analysis was conducted after the items on the distractibility component were reverse coded. This was done to see if these items would load on the task persistence component as Lyons-Thomas and McClowry (2012) reported. Subsequently, apart from a change in the sign of the loading coefficients, no change in the component structure resulted. Four components with items corresponding to the previous four components were found (Table 1).

The internal consistency reliability of the negative reactivity, distractibility, withdrawal, and task persistence total scores were estimated. The coefficient alpha scores were all acceptably high (Table 2) with alphas ranging from 0.76 (Withdrawal) to 0.92 (Negative reactivity). The four dimensions of temperament were weakly correlated (Table 3). All items had strong item-total correlations for each of the dimensions – Negative reactivity had item-total correlations which ranged from .51 to .77; Withdrawal had item-total correlations which ranged from .38 to .64; Distractibility had item-total correlations which ranged from .61 to .75; Task Persistence had item-total correlations which ranged from .50 to .73.

Table 2. Internal consistency reliability of the temperament dimension scores

Alpha	Coefficient
Negative Reactivity	0.902
Distractibility	0.862
Withdrawal	0.760
Task Persistence	0.774

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Table 3. Correlations between temperament dimension scores

	Negative Reactivity	Attention	Withdrawal	Task Persistence
Negative Reactivity	1.000			
Distractibility	0.027	1.000		
Withdrawal	0.167*	0.119	1.000	
Task Persistence	-0.290**	0.178*	0.079	1.000

Discussion of Findings

Results from the analysis of the data indicated that the T-SATI consisted of four components in this sample of Jamaican children. The four components appear to assess negative reactivity, distractibility, withdrawal and task persistence. Measures derived from the components all had acceptable levels of internal consistency reliability. This pattern of findings was different from that found by the developers of the T-SATI (Lyons-Thomas & McClowry, 2012).

Lyons-Thomas and McClowry (2012) found four clear factors underlying the T-SATI. They labelled these four components negative reactivity, task persistence, withdrawal and motor activity. In the current analyses, four components were also generated from the T-SATI. However, these four components were somewhat different from those found by Lyons-Thomas and McClowry (2012). In the Jamaican sample, the four components appear to assess negative activity, withdrawal, distractibility, and task-persistence. While both contexts produced a negative reactivity component, in the Jamaican sample, the items related to motor activity formed part of the negative reactivity component. To substantiate this result, the motor activity items (as found in the analyses by Lyons-Thomas & McClowry, 2012) were separated from the negative reactivity, and correlated the revised dimensions to each other. This yielded a strong,

statistically significant correlation between negative reactivity and the motor activity items ($r = 0.640$, $p < .01$). This suggests that the items associated with the motor activity dimension in Lyons-Thomas and McClowry's (2012) analysis fit with the negative reactivity dimension. Thus, in the Jamaican context, motor activity did not form a separate factor of temperament. This suggests that in the Jamaican context negative emotional lability is associated with high levels of motor activity. This was further substantiated by the change in internal consistency reliability when the motor activity items were included in the negative reactivity dimension (see Table 3).

While the task persistence dimension was retained in our analysis, we found that the five negatively worded items, which were a part of Lyons-Thomas and McClowry's (2012) analysis task persistence component, formed a separate dimension for the Jamaican context. In the present study, these items were labelled 'distractibility' because the content of the items reflects problems with attention to tasks at hand. The items are: "Quits routine classroom assignments before finished" (Component Loading = .857), "Leaves own projects unfinished (drawings, written work, models)" (Component Loading = .829), "Has difficulty completing assignments" (Component Loading = .80), "Does not complete seatwork unless reminders are given" (Component Loading = .736), and "Switches from one activity to another before finishing the first" (Component Loading = .715). The separation of these distractibility items from the task persistence dimension was substantiated by the high internal consistency reliability associated with the dimension (Alpha = .862). In addition, the correlation of these two dimensions were low ($r = .178$, $p < .05$). This suggests that the items associated with distractibility in the Jamaican context have only small associations to that reflecting task persistence.

The attributes of Keogh's et al. (1982) Teacher Temperament Questionnaire (TTQ) are similar to that of the T-SATI. The results of the TTQ are also similar to those represented in this study. TTQ factors, such as the task-related factor, is similar to the task persistence measured on the T-SATI. The dimensions of the task-related factor are persistence, distractibility, and activity (Keogh et al., 1982), while the dimensions of task persistence are persistence and distractibility (Lyons-Thomas & McClowry, 2012).

Regarding the present testing of the T-SATI in the Caribbean, our results confirmed that task persistence is a factor of the instrument; however, as mentioned before in this study, the items measuring distractibility clustered as a separate factor from task persistence. Also,

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distractibility was not a factor in the TTQ, but was an attribute of the task-related factor. The attributes of the T-SATI are confirmed by those presented in the factor structure of TTQ. Although the labels of the factors and dimensions are similar to T-SATI, in this study, the factor structure is somewhat different in regard to the dimensions of T-SATI.

The differences in the factor structure of the items could be attributed to differences in culture and context. Lyons-Thomas and McClowry (2012) acknowledge that these differences can influence the structure of the instrument. They note that “the validity and reliability of the instrument should be reassessed when used in other studies, especially when applied to a different racial/ethnic group” (p. 31). Though the structure is somewhat different from Lyons-Thomas and McClowry’s (2012), the instrument is useful in helping teachers to understand their students in a given academic year. Teachers should be trained in how to use the instrument to assess students’ temperament as this will assist the teachers in understanding students who may be withdrawn or disruptive in their behaviour, and thereby enable the teacher to be better able to create a goodness-of-fit environment.

Limitations and Future Directions

The students’ sample size was relatively small due to the demand for teachers to rate each child using the instrument. Teachers reported that completing the measure for different students in their classrooms was challenging, even though the measure was administered by a trained research assistant. These findings may not be able to generalise to the larger population of Jamaican school children rated by their schoolteachers.

This study represents the first testing of T-SATI in the Caribbean context. It is also the initial testing of the instrument by researchers, independent of the developers. Therefore, widespread consistency in the factor structure in different countries is yet to be established. The fact that there are differences in the proportion of the total variances of PCA, Lyons-Thomas and McClowry (2012) results indicate 70%, while this present study shows 52.7%), along with fact that motor activity was not a separate factor of temperament suggest that further investigation may be needed with a larger sample size within the context. Also, future studies should assess if task persistence and distractibility can be split into separate dimensions or if they form one dimension, as found by Lyons-Thomas and McClowry (2012). The constraints do not discount the fact

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that the scale can still be used to give classroom teachers insights into the temperament profile of their students (see p. 16).

Conclusion

The T-SATI is a reliable measure that appears to represent four critical dimensions of temperament. T-SATI, as a stable indicator of four dimensions of children's temperament, will be useful in helping teachers to understand their students better in a given academic year. In identifying the different temperaments, both the positives and concerns of specific temperaments can be determined. Teachers will, therefore, be able to create goodness-of-fit environment for their students. Such knowledge can be useful in assisting teachers' understanding of the children with whom they interact in the classroom and, thus, enhance the teacher-student relationship. Therefore, temperament should be included in teacher training programmes and as an in-service training course. The T-SATI may also allow principals to assess whether the classroom environment aligns with students' temperamental needs.

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References

- Al-Hendawi, M. (2013). Temperament, school adjustment, and academic achievement: Existing research and future directions. *Educational Review*, 65(2), 177-205.
- Alexander, K. L., Entwistle, D. R., and Dauber, S. L. (1993). First-grade classroom behavior: Its short- and long-term consequences for school performance. *Child Development*, 64, 801-814.
- Auerbach, J. G., Faroy, M., Ebstein, R., Kahana, M., & Levine, J. (2001) The association of the dopamine D4 receptor gene (DRD4) and the serotonin transporter promoter gene (5 HTTL-PR) with temperament in 12-month-old infants. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 42(6), 777-783.
- Berk, L. (2014). *Development through the lifespan*. Boston, MA: Allyn & Bacon.

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- Bogges, T. E., Griffey, D. C., & Housner, L. D. (1986). The influence of teachers' perceptions of student temperament on managerial decision-making. *Journal of Teaching in Physical Education*, 5, 140-148.
- Chess, S. (1990). Studies in temperament: A paradigm in psychosocial research. *The Yale Journal of Biology and Medicine*, 63, 313-324.
- Curby, T. W., Rudasill, K. M., Taylor, E., & Pérez-Edgar, K. (2011). The role of classroom quality in ameliorating the academic and social risks associated with difficult temperament. *School Psychology Quarterly*, 26(2), 175-188.
- De Pauw, S. S. W., Mervielde, I., & Van Leeuwen, K. G. (2009). How are traits related to problem behavior in pre-schoolers? Similarities and contrasts between temperament and personality. *Journal of Abnormal Child Psychology*, 37, 309-325.
- Evans, M. A. (2001). Shyness in the classroom and home. In W. R. Crozier & L. E. Alden (Eds.), *International handbook of social anxiety: concepts, research and interventions relating to the self and shyness* (pp. 159-183). Westport, CT: Wiley.
- Goldsmith, H. H., Lemery, K. S., Aksan, N., & Buss, K. A. (2000). Temperament substrates of personality development. In V. J. Molfese & D. L. Molfese (Ed.), *Temperament and personality development across the life span* (pp. 1-32). London: Routledge
- Hamre, B. K. & Pianta, R. C. (2001). Early teacher-child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development*, 72(2), 625–638.
- Hughes, K. & Coplan, R. J. (2010). Exploring processes linking shyness and academic achievement in childhood. *School Psychology Quarterly*, 25, 213–222.
- Keogh, B. K., Pullis, M. E., & Cadwell, J. (1982) A Short Form of the Teacher Temperament Questionnaire. *Journal of Educational Measurement* 19(4): 323-329.
- Lo, S. L., Vroman, L. N., & Durbin, C. E. (2015). Ecological validity of laboratory assessments of child temperament: Evidence from parent perspectives. *Psychological Assessment*, 27(1), 280–290. <https://doi.org/10.1037/pas0000033>
- Lyons-Thomas, J. and McClowry, S. (2012). The examination of the validity and reliability of the teacher school –age temperament inventory. *Journal of Classroom Instruction*, 47(2), 25-32.
- McClowry, S. G. (1995). The development of the school-age temperament inventory. *Merrill -Palmer Quarterly: Journal of Developmental Psychology*, 41(2), 271-285.
- McClowry, S. G. (2014). *Temperament-based elementary classroom management*. Lanham, MD: Rowman & Littlefield.
- McClowry, S. G., Rodriguez, E. T., Tamis-LeMonda, C. S., Spellmann, M. E., Carlson, A. & Snow, D. L. (2013). Teacher/student interactions and classroom

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- behavior: The role of student temperament and gender. *Journal of Research in Childhood Education*, 27, 283-301.
- Merenda, P. (1997). Methods, plainly speaking. A guide to the proper use of factor analysis in the conduct and reporting of research: Pitfalls to avoid. *Measurement and Evaluation in Counseling and Development*, 30, 156-164.
- Orne, M. and Jones, I. (2009). The relationships between child temperament, teacher-child relationships, and teacher-child interactions. *International Education Studies*, 2(4), 123-131.
- Posner, M. I., Rothbart, M. K. and Sheese, B. E. (2007). Attention genes. *Developmental Science*, 10, 24–29.
- Raubenheimer, J. (2004). An item selection procedure to maximise scale reliability and validity. *SA Journal of Industrial Psychology*, 30(4), 59-64.
- Raver, C. C. (2003). *Young children's emotional development and school readiness*. Champaign, IL : ERIC Clearinghouse on Elementary and Early Childhood Education. Retrieved from <https://files.eric.ed.gov/fulltext/ED477641.pdf>.
- Rothbart, M. K. (2007). Temperament, development, and personality. *Current Directions in Psychological Science*, 16(4), 207-212.
- Rothbart, M. K., Ahadi, S. A. and Evans, D. E. (2000). Temperament & personality: Origins and outcomes. *Journal of Personality and Social Psychology*, 78(10), 122-135.
- Rothbart, M. K., Ahadi, S. A. and Hershey, K. L. (1994). Temperament and social behaviour in childhood. *Merrill-Palmer Quarterly*, 40, 21–39.
- Rothbart, M. K., and Mauro, J. A. (1990). Questionnaire approaches to the study of infant temperament. In J. W. Fagen & J. Colombo (Eds.). *Individual differences in infancy: Reliability, stability, and prediction* (pp. 411-429). Hillsdale, NJ: Erlbaum.
- Rudasill, K. M. and Konold T. R. (2008). Contributions of children's temperament to teachers' judgments of social competence from kindergarten through second grade. *Early Education and Development*, 19, 643–666.
- Shiner, R. and DeYoung, C. G. (2011). The structure of temperament and personality traits: A developmental perspective. *Human Capital and Economic Opportunity: A Global Working Group*. Chicago, IL: Economic Research Center, University of Chicago
- Skinner, E, Kindermann, T. A. and Furrer, C. J. (2009). A motivational perspective on engagement and disaffection conceptualization and assessment of children's behavioural and emotional participation in academic activities in the classroom. *Educational and Psychological Measurement*, 69(3), 493-525.
- Thomas, A. and Chess, S. (1977). *Temperament and development*.. Oxford, UK: Brunner/Mazel.
- Zentner, M. & Bates, J. E. (2008). Child temperament: An integrative review of concepts, research programs, and measures. *European Journal of Development Science*, 2(1), 7-37.