AN EXPLORATION OF INDIVIDUAL DIFFERENCES IN TEACHERS' TEMPERAMENTS AND MULTIPLE INTELLIGENCES

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Abstract

For this study on individual differences, predictions were made from the literature on the four temperaments in order to examine how teachers with particular temperaments might use their multiple intelligence strengths in their approaches to teaching and learning. From a cohort of 336 beginning teachers it was found that temperaments and multiple intelligences are two separate constructs. The differences in patterns of intelligence strengths confirm that each of the four temperaments is distinct from the other. Teachers adopting a Catalyst Temperament have above average strengths in Linguistic, Musical, Interpersonal and Intrapersonal Intelligences. Those with a Stabilizer Temperament display above average strengths in Logical-Mathematical and Interpersonal Intelligences. Teachers adopting a Theorist Temperament demonstrate strengths in Logical-Mathematical, Linguistic, Spatial and Intrapersonal Intelligences. Those with an Improviser Temperament show below average strengths in all except Bodily-Kinesthetic Intelligence.
Key words: *multiple intelligences, four temperaments, teaching styles.*

Introduction

Over the past two decades the individual qualities held by teachers have been increasingly recognised as having a major influence on their capacity to create opportunities for effective learning for the students that they teach. Gardner (2006, p.196) comments that „while differences among individuals have always been noted in both lay and scientific circles, of course, these differences have either been viewed along one dimension (more or less intelligent) or in a very general way (individuals have different personalities, temperaments, styles, and the like)."

Purpose: In this paper we report on an investigation of two constructs related to individual differences that are relevant to understanding how the particular talents of teachers are related to each other. This study examines the relationship between the construct of temperament detailed by Berens and that of Gardner's construct of multiple intelligences. The study attempts to differentiate the particular intelligences called on by teachers adopting a particular temperament. It is possible that these constructs are overlapping and the study aims to ascertain any such relationship.

The paper first outlines the theory of the four temperaments, then describes the ideas about the seven multiple intelligences, and subsequently develops hypotheses about the relationships between the four temperaments and the seven multiple intelligences.

Temperament Theory: There are many ways of explaining human differences. One approach distinguishes four distinctive patterns or psychological types. Giovannoni, Berens & Cooper (1990) described this temperament theory of human behaviour. Their analysis was based on the concepts of Keirsey and others who noted regularities in observations of behaviour pat-

terns. These patterns have a long history from the times of Hippocrates through to the four spirit keepers of American Indians, and to the investigations of Kretschmer and Spranger.

The study of the four temperaments „examines themes and core values of a personality and its configuration as a whole… Temperament, or the pattern which is there to begin with, unfolds through a process of differentiation rather than through an 'adding on' or 'reorganisation' of parts or traits" (Giovannoni *et al*, p.3). Keirsey & Bates (1978) observed that „one's temperament determines behaviour because behaviour is the instrument for getting us what we must have, satisfying our desire for that one thing we live for" (p.30). In temperament theory, behaviours cluster into distinctive activity patterns that can be organised around core themes or values specific to each temperament.

A useful instrument to identify which of the four temperaments is at play is the Myers-Briggs Type Indicator® (MBTI) (Myers, McCaulley, Quenk & Hammer, 1998) developed using patterns of preferences identified by Myers drawing on the work of Jung on differences in the use of cognitive processes. Each temperament represents a pairing of either a concrete or abstract attitude with a theme that is either based on affiliation or pragmatism. A shorthand code is often used to indicate the particular cognitive processes.

According to Kroeger & Thuesen (1995) the first letter of a temperament pair represents a preference for either S (Sensing) or N (Intuition) to describe one's preference for the information gathering process. The second letter is determined by what the first letter is. If it is S (Sensing) the preference for gathering information is concrete and tactile, and the next most important question is what one does with those perceptions – do you organise them, J (a Judging function), or continue to take them in or perhaps even seeking more, P (a Perceiving function)? This leads to the first two temperament groups: SJ and SP. If the first letter is N (Intuition), the preference is for gathering data in abstract and conceptual ways. The second most important preference is how you prefer to evaluate the data you have gathered, either objectively T (Thinking) or subjectively F (Feeling). This leads to the second pair of temperaments NT and NF.

Beren's approach to the temperaments: In her update of temperament theory, Berens (2006) has illuminated the four distinctive patterns in a series of portraits, and has developed a new terminology about the SJ, SP, NT and NF concepts to bring their essence to the foreground. This terminology is depicted by the Temperament Matrix shown in Table 1.

**Table 1.   Beren's formulation of the temperament matrix.
            (Source: after Berens 2006, p. 37).**

	Abstract attitude	Concrete attitude
Affiliative roles	„**Catalyst**" NF	„**Stabilizer**" SJ
Pragmatic roles	„**Theorist**" NT	„**Improviser**" SP

Descriptions of the four temperaments: Those persons with the **Catalyst** Temperament rely on the use of the mental processes of Intuition (N) and Feeling (F). These processes can be in either extraverted or introverted modes. They use the Feeling judgement process to give them ways to act in accordance with their value set, and the Intuition perception process to think about what will be or what is significant in the long run. Catalysts seem to be forever on the search to the question „Who am I?" as they establish that what they are doing contributes to some higher purpose and has meaning, and is valued by others. Their key talent is the ability to build bridges between people and use their empathetic skills to help resolve interpersonal conflicts.

Those persons with the **Stabilizer** Temperament have needs for membership or belonging, and for responsibility or duty, and these needs are met through Introverted Sensing. Their reference point is usually what has gone on before and their stored images and impressions (S) inform

their decision making which tends to be logical (J) in focus. Stabilizers have a strong need for connectedness and having clarity about their place in a group. Their focus on traditional ways of doing things expresses their desire for stability. They have a talent for logistics and knowing what the right sequence is to get the right things in the right place, quantity and time to the right people.

Those persons with the **Theorist** Temperament have strong needs for being competent, and their search for expert knowledge and mastery is supported by their use of Intuition (N) and Thinking (T). They are often found dealing with the world of theories and strategy, and prefer making objective decisions. Models, systems, and organising frameworks are used frequently to assist in these processes as they favour logical analysis. Theorists are happy working with a level of abstraction and have a talent for thinking through contingencies and developing multiple plans for them.

Those persons with the **Improviser** Temperament mostly use the process of Extraverted Sensing. This process keeps them in touch with the needs of the moment and the tactical moves they can make to seize opportunities. There is a pairing of Sensing (S) with Perception (P). Improvisers value both their freedom to respond, and their ability to make an impact (here-and-now) through their drive to take action. They are perceived as having a special talent for troubleshooting and being able to „read" a situation.

The dynamics of the four temperaments: The 2x2 format of Table 1 also depicts that each temperament pattern has something in common with the others. These communalities reveal themselves in the ways people communicate: their style of language, preferred roles and focus of attention.

The vertical dimension of abstract versus concrete attitudes illustrates differences in the way we tend to think about things and the way we use words. Language usually reflects our natural (preferred) way of viewing the world. The Catalysts and Theorists share a preference for working with the abstract: talking about concepts and patterns and searching for their meanings. The Stabilizers and the Improvisers both prefer the concrete: talking about tangible realities – those based on their experiences and observations.

The horizontal dimension of affiliative versus pragmatic roles illustrates differences in the way we prefer to interact with others. The Catalysts and the Stabilizers share a common interest in affiliative roles where people act in community with a sense of what is a good outcome for the group. The Theorists and Improvisers are more interested in pragmatic roles where people are guided by what they see needs to be done to achieved desired outcomes.

The two diagonal relationships express the focus of attention on structure versus motive. The Catalyst and Improviser Temperaments share a focus of attention on motive or why people do things. The Theorist and Stabilizer Temperaments share a focus of attention on structure valuing order and organisation. The nature of what is paid attention to is the important distinction, not what people's interests are.

This model of the dynamics of interaction explains why people can become polarized and why they may have great difficulty in communicating and working with others of a different temperament.

Multiple Intelligences: Another approach to studying individual differences comes from the work of Howard Gardner and his ideas about the existence and development of multiple intelligences. As detailed in his book *Frames of Mind*, Gardner (1993) challenges the traditional view of intelligence (in which abilities are often limited to areas such as mathematical and linguistic intelligence) by proposing a theory about the existence of many or multiple intelligences. Gardner (1999, p.33) defines intelligence as „a biopsychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture." He argues that human intellectual competence must entail a set of skills of problem solving and must also entail the potential for finding or creating problems - thereby laying the groundwork for acquisition of new knowledge.

Concerned that traditional ideas about the nature of intelligence failed to take into account large areas of human endeavour, Gardner (2006, p.6) reports that he believes „ that human cognitive

competence is better described in terms of a set of abilities, talents, or mental skills, which I call 'intelligence'". He asserts that human talents are based on distinctive patterns of brain connectivity and that these patterns can be observed as a person encounters and eventually masters an organised activity or domain in their culture. He acknowledges that all normal individuals possess each of the skills he describes as forming an intelligence to some extent, but that individuals differ in the degree and nature of their combination.

The criteria for acceptance as a separate intelligence included skills that were universal to humans and differentiated by brain functioning, e.g. detailed consideration of what happens in the event of brain damage, studies of exceptionally gifted people, identified by a core operation or neural system, and able to be encoded in meaning within a culture.

In the following section each of Gardner's initial formulation of seven intelligences is described.

Linguistic Intelligence involves sensitivity to spoken and written language, the ability to learn languages, and the capacity to use language to accomplish certain goals. This intelligence includes the ability to effectively use language to express oneself rhetorically or poetically.

Logical-Mathematical Intelligence consists of the capacity to analyze problems logically, carry out mathematical operations, and investigate issues scientifically. This intelligence entails the ability to detect patterns, reason deductively and think logically. This intelligence can be nonverbal in that the solution process may be totally invisible before the „aha!" experience.

Musical Intelligence involves skill in the performance, composition, and appreciation of musical patterns. It encompasses the capacity to recognize and compose musical pitches, tones, and rhythms.

Bodily-Kinesthetic Intelligence entails the potential of using one's whole body or parts of the body to solve problems. It is the ability to use mental abilities to coordinate bodily movements, illustrated by ability to use the body to express an emotion such as in dance, to play a game as in sport, or create a new product such as an invention.

Spatial Intelligence involves the potential to recognize and use the patterns of wide space and more confined areas. Successful navigation uses this intelligence as mental pictures form to assist in spatial problem solving. People who are visually impaired use this intelligence through the tactile modality to recognize size and shape of objects.

Interpersonal Intelligence is concerned with the capacity to understand the intentions, motivations and desires of other people. This intelligence allows people to work effectively with others. The intelligence draws on a core capacity to notice distinctions among others.

Intrapersonal Intelligence entails the capacity to understand oneself, to appreciate one's feelings, fears and motivations. This intelligence involves having an effective working model of oneself, and to be able to use such information to regulate one's life.

Gardner's listing of seven intelligences is provisional and in later writing (Gardner, 1999), he considers other candidates, e.g. Naturalist and Existential Intelligences. Gardner (2006, p.27) states, „I think of the intelligences as a mental chemistry set: it is desirable to explain as many human capacities as possible through a combination of the existing elements rather than through the creation of a new one".

Developing hypotheses about the intelligences and the temperaments: Gardner (2008, p.11) asserts that „personality and temperament are at least as important as cognitive powers" and that „human cognitive competence is better described in terms of a set of abilities, talents, or mental skills". Berens (2006) draws attention to the varying talents developed by those with the four different temperaments.

In this section, we review Beren's (2006) statements that are drawn from her research and workshop experiences. The statements are used here as a basis for predicting possible relationships between the four temperaments and Gardner's seven multiple intelligences. We indicate (below) where Beren's statements about talents and skills associated with different temperaments might bear relationships to particular intelligences. These possibilities will be subjected to analysis from the data reported later. These possibilities are best regarded as tentative hypotheses.

Predictions for Catalyst Temperament

Higher than average Linguistic Intelligence:

„Those with a Catalyst temperament tend to develop metaphors easily, and their language is often rich with them. These metaphors are often deeply symbolic."

„They have a talent for explaining to others what people mean or intend, to transform the communication while maintaining the meaning."

Higher than average Interpersonal Intelligence:

„They tend to be gifted at unifying diverse people and helping individuals realise their potential."

„They often seem driven to enlighten or give spiritual or intellectual insight that will help people grow and develop."

„They seem to have an antenna that allows them to know others' deeper motivations and a talent for expressing that knowledge so that others also know it."

Higher than average Intrapersonal Intelligence:

„Those with a Catalyst temperament tend to relate personally and seem to need to feel a personal connection if they are going to learn something or work with something or others."

„Their core needs … want a sense of who they are as individuals „Who am I?""

In Beren's writings, there appear to be no statements for this temperament that relate to other intelligences.

Predictions for Stablizer Temperament

Higher than average Logical-Mathematical Intelligence:

„They seem to have a talent for knowing just what the right sequence is… putting first things first and getting them in order."

„They have a knack for attending to rules, procedures and protocol."

„They know how things have always been done, so they anticipate where things can go wrong."

Higher than average Linguistic Intelligence:

„They make sure the correct information is assembled and presented to the right people".

„Make use of the language of the group to which they belong".

Higher than average Interpersonal Intelligence:

„Those with the Stabiliser temperament take pride in their ability to provide for others, either for their comfort or for their material well-being."

In Beren's writings, there appear to be no statements for this temperament that relate to other intelligences.

Predictions for Theorist Temperament

Higher than average Linguistic Intelligence:

„They want the words chosen to express precisely what is intended and may nitpick over the tiniest nuance of meaning. They are offended by imprecise and vague language."

Higher than average Logical-Mathematical Intelligence:

„Those with a Theorist temperament naturally think in terms of systems. They know that what happens in one aspect of a system affects the rest of the system."

„Researching, analysing, searching for patterns, and developing hypotheses are quite likely to be their natural *modus operandi*."

„No strangers to complexity, theories, and models, they like to think of all possible contingencies and develop multiple plans for handling them."

Higher than average Intrapersonal Intelligence:

„They have a talent for seeing differences…they can hardly stop themselves from seeing differences.''

„Those with the Theorist temperament can be so focussed and very deep in thought that they notice little else… not notice people or events around them.''

„They… tend to seek a sense of inner calm or composure so that they can think more clearly.''

In Beren's writings, there appear to be no statements for this temperament that relate to other intelligences.

Predictions for Improviser Temperament

Higher than average Linguistic Intelligence:

„Those with an Improviser temperament tend to be at the cutting edge with their language.''

„Those with an Improviser temperament communicate best with anecdotes since these story-like vignettes entertain, have impact, and are concrete and contextual.''

„They find a way to produce or present something that has enough impact that people want to respond or use what they've done.''

Higher than average Bodily-Kinesthetic Intelligence:

„They are talented at using tools, whether the tool be language, theories, a paint brush, or a computer.''

„This (skill to adapt) is to make small adjustments to make something fit. Those with an Improviser temperament do this with objects and situations as well as with their chameleon-like selves.''

„When there is a drive for action but waiting is called for, restlessness results. This may take the form of some kind of movement.''

Higher than average Spatial Intelligence:

„Those with the Improviser temperament tend to reference everything to the present context. This tendency allows them to see the relevance of things, how they fit, and to notice when something is awry.''

„They tune into immediate sensory information and vary their actions according to the needs of the moment.''

Higher than average Interpersonal Intelligence:

„They can easily read the situation at hand, instantly make decisions, and, if needed, take actions to achieve the desired outcome.''

„They have an impact on people – motivation and relationship focus''.

„The Improviser role is one of constantly varying your response to what is going on, often making up new responses as you go.''

In Beren's writings, there appear to be no statements for this temperament that relate to other intelligences.

Methodology of Research

Sample

The sample of convenience was the cohort of the third year of a teacher education degree course at a University in metropolitan Melbourne, Australia. There were 336 beginning teachers enrolled in a variety of teaching subjects, preparing themselves to teach at primary (elementary) and/or secondary levels of education. Most were less than 25 years of age, but the cohort did contain some mature age students. The specialisations involved included English and Humanities, Science and Technology, Physical Education and The Arts. There were 88 males and 248 females in the cohort.

Instruments

Two instruments were used in this study: the Myers-Briggs Type Indicator (MBTI) to identify temperament, and the Multiple Intelligences Checklist for Adults (MICA) to identify the different intelligence strengths.

The MBTI was scored to identify each student's temperament, and has very adequate reliability and validity to support its use in studies of temperament, see Myers et al (1998).

The MICA was developed for use with Australian teachers in mind, and is well grounded in Gardner's theory and has acceptable face validity. The inventory used in this study (MICA) was developed before Gardner's discussion of Naturalist and Existential Intelligence and thus includes only the initial seven intelligences. The MICA (McGrath & Noble, 1995) is a self-reporting questionnaire developed for adults in which participants are asked to respond to a series of items. The MICA was scored for each of the seven intelligences.

The beginning teachers volunteered to take the MBTI and the MICA as part of their tutorial program about Individual Differences in their Education Studies. The study was conducted following the University's guidelines for ethical research using human subjects. Group feedback sessions were arranged.

Statistical analyses

Analyses were conducted using the Statistical Package for the Social Sciences. The data were subjected to a repeated measure MANOVA with the four temperament groups as the levels of the independent variable and the seven MICA scores as the within-subjects factor.

Results of Research

All multivariate tests were significant ($p<.001$) for the interaction between temperament groups and multiple intelligence scores e. g. Wilks' Lambda 0.85, partial *eta* squared 0.051. These results signified that the observed differences between the temperament groups across the MICA scores were unlikely to be due to chance factors.

Differentiation of the four temperaments. The first set of results examines to what extent the four temperaments could be differentiated by their use of the various multiple intelligences, and reports on the tentative hypotheses proposed between temperaments and intelligences.

In the following Figures the profiles across the multiple intelligences for each of the four temperament groups are presented. The mean standard scores are shown as they allow valid comparisons to be made between each of the variables on a standard measure. Bars above the zero line represent mean scores higher than average, and bars below the zero line represent mean scores that are below average for this sample. A zero score represents the total sample's mean score.

The Figures below show each temperament separately as we were interested in the distinctive patterns of intelligences (talents) that a teacher displaying a particular temperament might utilise.

It can be observed that each of the Figures 1 to 4 are different in form and detail and lead to the conclusion that the temperament groups are dissimilar from each other.
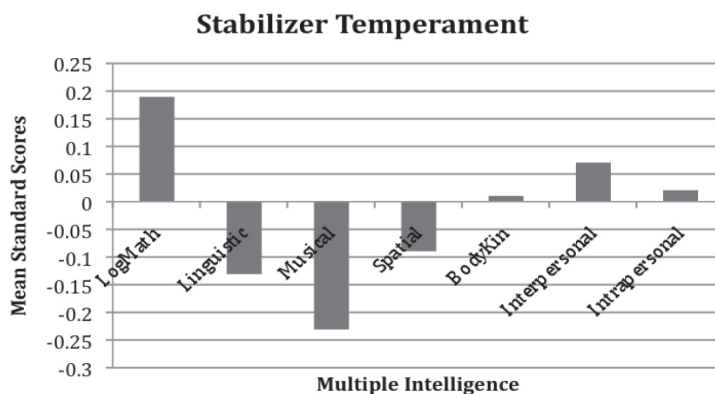
Catalyst Temperament
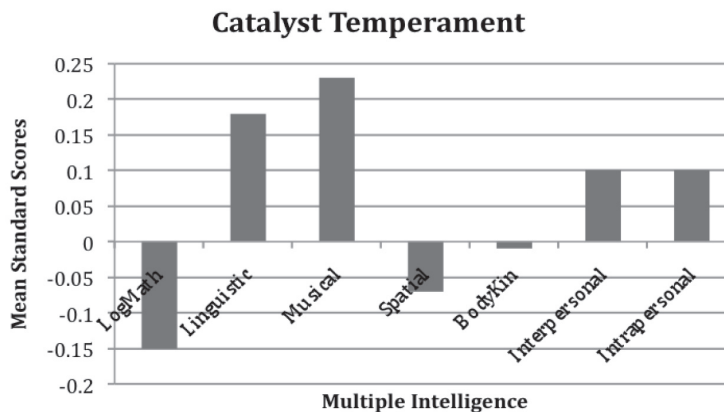
Figure 1.   Catalyst Temperament and strength of intelligences.

The profile for the multiple intelligences for the Catalyst Temperament in Figure 1 shows four higher than average mean scores and two lower than average with one borderline. Three of the four above average scores were hypothesised for this group, but the highest mean score for Musical Intelligence was not predicted. Those that were indicated as likely from our analysis of Beren's writings about temperament were superior utilisation of Linguistic, Interpersonal and Intrapersonal Intelligences.

These higher scores are in line with the descriptions of those with the Catalyst Temperament using their talents in building bridges between people and using their empathetic skills. The role of language seems to be crucial here, as are the value systems that guide their pursuit of deeper meanings.

One group's strengths are often counterbalanced by areas that are not as highly developed. In the case of the Catalyst group they do not score as highly on Logical-Mathematical and Spatial Intelligences, indicating a relative weakness in dealing with these aspects in their problem solving.

Stabilizer Temperament

Figure 2.   Stabilizer Temperament and strength of intelligences.

The profile for the Stabilizer Temperament shown in Figure 2 differs from that of the Catalyst Temperament shown in Figure 1. Their strength seems to be in their talent for the use of Logical-

Mathematical Intelligence. Other means above the average for the group are fairly insignificant (Interpersonal Intelligence is higher than Bodily-Kinesthetic and Intrapersonal Intelligences which are both close to the sample's average). The higher talent for Logical-Mathematical Intelligence was hypothesised, but the expectation for higher than average Linguistic Intelligence was not confirmed by these data. Two predictions were clearly supported by the analysis for those with this temperament. The profiles show lower than average scores for Musical, Linguistic and Spatial Intelligences for those with this temperament.
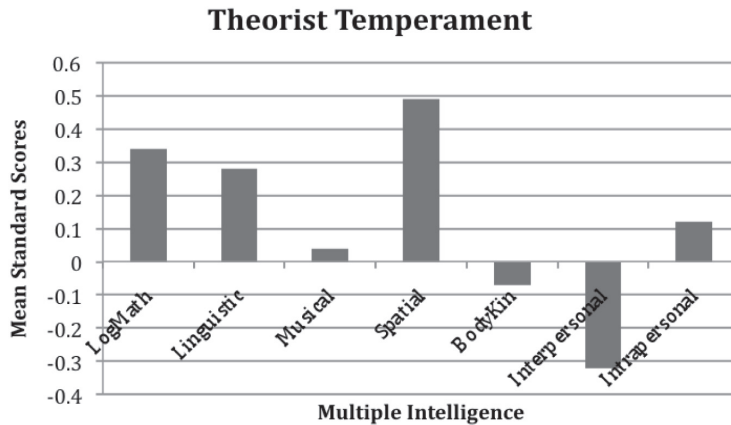
Figure 3.   Theorist Temperament and strength of intelligences.

Again the profile shown in Figure 3 is different in pattern to those already considered. The three highest mean scores for Spatial, Logical-Mathematical and Linguistic Intelligences were all predicted for the Theorist Temperament from our analysis of Beren's writings. A higher than average result for Intrapersonal Intelligence was also observed. The four predictions made were supported.

The rather low mean score for Interpersonal Intelligence indicates that taking others into account is not a strong feature of those with the Theorist Temperament.
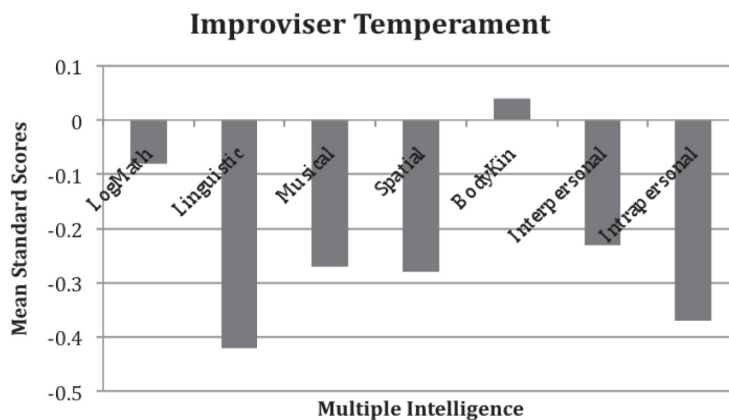
Figure 4.   Improviser Temperament and strength of intelligences.

The final Figure to be presented confirms the conclusion that each temperament has a distinctive pattern of their multiple intelligences. The scores for six of the multiple intelligences for

the Improviser Temperament are all below the sample's means. Only one mean score is marginally above the average. This was for Bodily-Kinesthetic Intelligence, which confirms only one of the predictions. However the predictions for higher than average Linguistic, Spatial and Interpersonal Intelligences for this temperament were clearly not supported by these data. Improvisers have the lowest mean scores for Linguistic and Intrapersonal Intelligences of all the groups and this may signify rather undeveloped intelligences.

The profiles for three of the temperament groups depicted in Figures 1 to 4 largely support the writings of Berens, but those for the Improviser Temperament in Figure 4 stand out because of their many negative mean standard scores. Such a finding is unusual as it could be expected that patterns of use of multiple intelligences might show some variation, but that a pattern of some strengths and some weaknesses could be expected for any group. It is possible that the items used in the MICA are not sufficiently broad to effectively sample the domains, and that the Improvisers have somehow missed out on displaying their strengths. However another line of thought suggests that the observed patterns may reflect the capacity of the Improviser to act on the spur of the moment creating a quick solution to a problem, but this action not necessarily being the most effective long term solution valued by the community.

The dynamics of the four temperaments. In this second set of the results we report the trends found in the data across the dimensions and diagonals shown in Figure 1 illustrating the dynamics of the four temperaments. It will be recalled that the format of the 2 x 2 arrangement argued that each cell bears something in common with other groupings.

In terms of the vertical dimension the Abstract versus Concrete distinction, the results showed that for Linguistic and Musical Intelligences, the Abstract group (Catalysts and Theorists) had significantly higher scores ($p<.001$). This appears to relate to this group's preferences for talking about concepts and patterns, and their search for meaning. This distinction was also observed for Intrapersonal Intelligence scores ($p<.05$). The higher scores for Bodily-Kinaesthetic and Logical-Mathematical Intelligences for the Concrete group (Stabilizers and Improvisers) did not reach statistical significance.

In terms of the horizontal dimension, it was observed that those preferring an Affiliative role (Catalysts and Stabilizers) had significantly higher scores for both the Interpersonal and Intrapersonal Intelligences ($p<.01$). This is consistent with the adoption of roles in which people act in community with what is perceived to be good outcomes for the group. Both results are consistent with the thrust of this distinction of differences in the way in which we prefer to interact with others. Scores were also higher for Musical and Linguistic Intelligences for the Abstract group ($p<.05$). By way of contrast those with the preference for a Pragmatic role (Theorists and Improvisers), their higher scores on Logical-Mathematical and Spatial Intelligences were not statistically significant. These temperaments associated with the Pragmatic role are guided by what they see needs to be done to achieve desired outcomes.

The diagonal aspects of Figure 1 contrast the groups in a different way, i.e. their focus of attention on either structure or motive – an interest in „why people do things". It was found that the Theorists and Stabilizers had significantly higher scores on Logical-Mathematical Intelligence ($p<.001$), giving credence to the attention this pair of temperaments place on order and organisation. The Catalyst and Improviser group had significantly higher scores for Musical Intelligence ($p<.05$).

Discussion

The findings of this research highlight some interesting and some surprising results. It is clear that temperament and multiple intelligences are two separate constructs. Each of the four temperaments as identified by Berens is linked to a specific pattern of multiple intelligence strengths. Conversely, the observed differences in the patterns of the intelligences confirm that each of the four temperaments is distinct from each other. Therefore it can be concluded that the use of both constructs adds value to each one taken separately.

The teachers in this study come from a variety of teaching specialisations but the NF-

Catalyst Temperament has the highest frequency. However each of the temperaments are well represented indicating that the temperaments can be used to describe teacher characteristics. Drawing on the different patterns of intelligence strengths we can now extend these descriptions.

The particular pattern of intelligences utilised by a teacher displaying a particular temperament has significance for both the teacher and the learner. A teacher who displays the Catalyst Temperament, i.e. uses empathetic skills to resolve interpersonal conflicts, will do so using their strengths in Linguistic, Musical, Interpersonal and Intrapersonal Intelligences. One can expect that Catalyst teachers will be motivated by their need to feel special, to have a purpose and be engaged in empathetic relationships. This is likely to be indicated in a caring style with the needs of learners the main focus of attention. The strength of their Musical Intelligence was not predicted from the literature but resonates with their feeling preferences in regard to decision-making. Perhaps it is the emotional impact of the musical experience that appeals to the Catalyst Temperament.

However, a teacher who displays a Stabilizer Temperament, i.e. who knows what the right sequence is to get the right things into the right place, will be supported by their strength in Logical-Mathematical Intelligence but will be challenged when trying to communicate those ideas due to their lesser strength in Linguistic Intelligence. Stabilizer teachers will respond very positively to being part of a team and to having clear responsibilities. They are very likely to want to contribute to achievement of concrete outcomes. Their approach to learners is very likely to be matter-of-fact with their presentation of organised sequential studies being an observable characteristic. Their strength in Interpersonal Intelligence was not predicted from the literature.

A surprising result for the Theorist teachers is their comparatively high score for Spatial Intelligence that was not predicted from the literature on temperament. The Theorist teacher has a need to be viewed as competent and they value their autonomy and intellectual independence. Their teaching is likely to appeal to students with the same temperament. Their teaching will be thoughtfully presented, stimulating learners thorough exploration of concepts and a divergence of outcomes. In terms of their intelligence strengths it could be expected that Theorist teachers would demonstrate strengths in Logical-Mathematical, Linguistic and Intrapersonal Intelligences in addition to the observed strength in Spatial Intelligence.

Another surprise of the results was not predicted from the literature. The pattern of intelligence strengths related to the Improviser Temperament was exceptional in this respect. The descriptor for this temperament led us to predict that this type of person would have strengths in Linguistic, Spatial, Bodily-Kinesthetic and Interpersonal Intelligences. However the results indicate that, apart from a slightly higher than average strength in Bodily-Kinesthetic Intelligence, all other intelligences were below average and in particular, that of Linguistic Intelligence. The reason for this seemingly 'lack of strength' in the multiple intelligences sampled by the MICA instrument are rather unclear. All that can be concluded from this pattern is that it is unusual and distinctive when compared with the other temperaments. It may be that the lack of clear strengths is associated with a breadth of talents not sampled adequately here. Perhaps their temperament presented issues with further development of a wide range of talents but with limited depth. A teacher displaying an Improviser Temperament will be challenged in their undertaking to seize opportunities and make a drive for action. Challenging too will be their attempts, compared to other teachers, to 'read' situations when venturing to solve problems. As Improviser teachers need freedom to act, to be noticed and to make an impact, they may appear to act more spontaneously than other teachers, quickly adopting a strategy that they feel will not only reflect their own temperament but also designed to meet their need to have an impact on the situation.

Conclusion

The theory behind the four temperaments suggests that individuals will differ in their ways of trying to perform at their best. To this assessment we can now add that they will tend to develop varying patterns of talents (intelligences) that can serve to differentiate the way in which they approach teaching and learning.

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