Chapter-II

Review of Related Literature

Research scholar has made sincere efforts to gather the ideas related to the present study. The investigator has tried his level best to collect and quote the findings on the relative studies conducted in the directions temperamental traits.

The research scholar also gone through the numerous studies, which have been conducted on temperament variables with various co-relative components in a different manner. The research scholar also attempted to review the literature available with the various libraries related to physical education, sports, education and psychology in different part of Haryana, Punjab and Chandigarh. Some of the most important studies which were found out by the researcher from the libraries like Department of Physical Education, M.D.U., Rohtak, K.U. Kurukshetra, NSNIS Patiala and P.V. Chandigarh, along with the help of personal collection of various literatures, books, research journals, research articles, magazine and newspaper etc.

The researcher has tried to scan the available literature to selected studies, which were directly related to the present study. An attempt has been made to present a summary review of literature, which may be help in understanding and bringing out meaningful outcomes from this study. The following related references has been reviewed as under:

- Plomin (1976)\(^1\) has studied the sociability and impulsivity components of extroversion. It was found that neither sociability not impulsivity in unitary. Corrections among there sociability and impulsivity factors and the MPI extraversion items indicated that MPI extraversion in essentially a measure of one aspect of sociability: the quantity of social relationship.

- Although temperament researchers had originally believed that temperament systems would be in place very early in development and change little with passage of time, we have since learned that temperament systems follow a developmental course. Thomas and Chess (1977)\(^2\) developed the concept ‘goodness of fit’ to describe how well children’s characteristics, capacities and temperament meet the expectations and demands of the environment. Maintenance of classroom order is a priority for

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teachers. When teachers are presented with behaviour potentially disruptive to classroom routine, they must make quick decisions about how to manage and respond to this behaviour. Poor fit can result when children’s expectations of acceptable behaviour.

Rowe and Plomin (1977)\(^3\) in their study observed that the structure of temperament prospered by the New York Longtilded study (NYLS) of A. Thoma et al (1963)\(^4\) was compared to Buss and Plomin’s (1975)\(^5\) EASI (Emotionality, Activity Sociability) temperament theory. A similar sociability factor emerged from both the NYLS and EASI systems but other temperaments were unique.

Other researchers (e.g., Werner & Smith, 1982)\(^6\) have studied temperament as a potential resilience factor in an environment characterized by high psychological stress and poor parenting. Positive child temperament characteristics, such as sociability and adaptability, appeared to protect children from later difficulties by attracting warmth and responsiveness from adults who guided the children’s development. Thus, the influence of temperament was mediated through the mentor relationship. Support for a mediational model was also found by Katainen, Paikkonen, Keskivaara and Keltikangas-Jarvinen (1999)\(^7\) in a study of almost 400 6- to 15 year-olds. Using structural equation modelling, low maternal role satisfaction and ratings of the child as difficult (i.e. high on activity, low on sociability and high on negative emotionality) at 6 years of age predicted hostile maternal child-rearing attitudes (emotional rejection, strict discipline and feeling that the child is a burden) at 9 years, which in turn were significantly related to adolescent-reported depression at 15 years. Although the fact that mothers provided both the temperament and parenting data limits the confidence with which mediated effects can be inferred, it appears that

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temperament affected parenting which led directly to the social development outcome of depression. Such mediational models deserve further research attention.

Braitwaite el al. (1984)\(^8\) examined that Psychometric properties of Buss and Plomin EASI – III (emotionally, sociability and impulsivity) temperament survey. They found that impulsivity emerged as a multidimensional construct, but its components were related to other temperaments in different ways. The preliminary analysis also suggested that the EASI – III can be used to measure other constructs, the most important of which are neuroticism and extraversion. In particular, the simplicity and clarity of the items and the well articulated sampling framework for their selection.

Cultural differences may influence the nature and stability of the connections between temperament and social development. One of the most often-quoted findings in the temperament field is the unexpected relationship between difficult temperament and lower infant mortality among the Masai of East Africa during a famine (DeVries, 1984)\(^9\). Difficult temperament was thought to increase chances of survival in this extreme environment because higher levels of fussing and crying increased the likelihood of being fed. These findings, although on a small number of children, serve as a dramatic reminder of the importance of goodness of fit. Similarly, Korn and Gannon’s (1983)\(^10\) finding that difficult temperament did not lead to the development of behaviour problems for a sub-sample of children from Puerto Rican families in New York, unlike the main white American sample, was interpreted as support for the notion of goodness of fit. It was postulated that the more flexible and relaxed Puerto Rican home environment facilitated a more accommodating parental response to child difficulty, and lessened the likelihood of coercive exchanges and processes developing. However, behaviour problems began to develop among this subgroup once they encountered the mainstream environment of school.

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Chapter II  

Review of Related Literature

Sebej, Mullner and Farkas (1984)\textsuperscript{11} while performing a difficult sensor motor task, anger was induced by providing false feedback to the subjects regarding their performance. They found that more arousing person (according to their train associability scale scores) evidenced greater around (i.e. diastolic pressure) in response to experimental manipulations that induced frustration and/or anger.

Temperament has been found to contribute to many facets of children’s lives at school. In the main, researchers have investigated direct effects, although some evidence is emerging of interactive and mediated effects. There has also been a concerted effort to examine goodness of fit in the school context (e.g. Lerner et al., 1986)\textsuperscript{12}.

While a number of researchers have identified additive effects in which both temperament and parenting make independent contributions to social development (e.g., Bates & Bayles, 1988\textsuperscript{13}; Sanson, Oberklaid, Pedlow & Prior, 1991)\textsuperscript{14}, fewer studies have looked at how temperament and parenting may interact with one another to affect social developmental outcomes. Such multiplicative effects are regularly postulated but not so frequently detected empirically. An elegant example of both theoretical and empirical work on temperament by parenting interactions is that of Kochanska and colleagues in the development of conscience. They emphasized the importance of the interaction between child temperament (especially reactivity and self-regulation) and parenting (e.g. Kochanska, 1993)\textsuperscript{15}. For example, Kochanska (1997)\textsuperscript{16} found that for fearful toddlers, a gentle style of maternal discipline facilitated conscience development at preschool age. For fearless toddlers, the experience of

higher attachment security and higher maternal responsiveness in toddlerhood predicted later conscience.

In contrast to inhibited children, temperamentally sociable children tend to have more positive relationships with friends and are more popular with peers (e.g. Skarpness & Carson, 1986). Stocker and Dunn (1990) investigated concurrent relationships between temperament and peer relationships (as well as children’s friendships) in 5 to 10 year-old children. Children who were rated by their mothers and teachers as temperamentally more sociable were also rated as more popular with peers and higher on peer leadership. These results are in contrast to some emerging from non-Western cultures and described in more detail in Section 6; for example, shy children in China scored higher on peer leadership than their more sociable counterparts (Chen, Rubin & Li, 1995).

Davis (1989) studied the reliability of psycho-physiological assessment with in temperament group. He found that skin conductance level (SCL) was consistently reliable index for extraverts but not for introverts.

In one study, Martin (1989) reported that children distractible and low in attention received more criticism from their teachers. Pullis (1985) discovered that when teachers thought children were capable of, but not practicing, self control, they were more likely to discipline the children with more punitive and coercive discipline techniques. Increasing teachers’ awareness of how children’s temperament dimensions might contribute to the situation can lead to reduced conflict (Pullis, 1985) and to the development of appropriate strategies specific to the temperament dimensions involved. When children are accepted and respected as individuals, the

focus moves from one of accusation to one of support; children fed less compelled to expend energy defending their positions and they are more inclined to consider alternatives for resolving problems. Children whose parents have given unconditional support are more likely to have more stable positive self-evaluations; children whose parents have been rejecting or conditional in their acceptance are likely to be less resilient (Harter, 1998).

Windle (1989) investigated the factor reliability of a 54 item, multifactorial self report measure of temperament for a cross-validation sample of young adults. Findings were: firstly, high congruity for the factor of activity level general, activity level, sleep, approach/withdraw, flexibility – rigidity, mood, rhythmic city sleep, rhythmicity – eating and distractibility. Secondly, items related to a distinct persistence factor in the original sample loaded on the distractibility factor in the cross validation sample. Also, rhythmic city – daily habits did not retain its factor integrity in the cross validation sample.

Windle investigated the interinventory nation of controls measured by the revised dimensions of temperament survey (DOTS – R); the emotionality, activity, sociability, impulsivity (EASI – II) temperament measure, and Eysenck’s personality inventory (EPI). Regarding this study moderate to high correlations were found between similarly labeled attributes of the three measures.

Connections between temperament and school adjustment and achievement have been viewed as an example of goodness of fit. In this view, children’s functioning at school is influenced by the congruence between temperament characteristics and contextual requirements, rather than temperament style by itself. In a series of studies investigating this issue, Lerner and colleagues found that when there is good fit, achievement and adjustment are enhanced (Lerner et al., 1986). As one example of this research, children with high correspondence between self-ratings

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of temperament and teacher ratings of desirable temperament characteristics, especially reactivity, were found to have higher achievement levels and were rated as of higher ability than children with poorer fit (Lerner et al., 1985). In another study, low fit adolescents, assessed by comparing self-ratings of actual temperament with parents’ and peers’ ratings of ideal temperament, had poorer teacher-rated academic competence and more parent-rated externalizing and school problems than high fit adolescents (Talwar, Nitz, & Lerner, 1990). The fit between self and ideal ratings on the mood and approach-withdrawal dimensions was particularly important.

The research on social class differences in temperament style suggests that children from lower SES families are over-represented at the ‘problematic’ end of temperament dimensions, especially relating to child difficulty (Fullard, Simeonsson & Huntington, 1989). Infants in a noisy and crowded home environment (which may be more typical of lower SES families) have also been found to be less approaching, less adaptable and more negative in mood (Wachs, 1988).

Moderational effects may also be important. Maziade et al. (1990) found evidence that parenting moderated the relationship between temperament and adolescent adjustment. They reported that difficult temperament at 7 years of age was associated with an increased risk of developing a psychiatric disorder at 12 and 16 years of age, but only when parenting was dysfunctional, with inadequate behavioural control featuring most prominently. This is one of few studies to examine moderator effects, suggesting a need for more systematic investigation.

In recent decades, it has been increasingly recognized that the child is not a passive participant in parent-child interactions and that what the child brings to the

interaction, particularly in terms of his/her temperament, may influence parenting and parent-child interactions (e.g. Bell, 196831; Lytton, 1990)32. Many models of development also emphasize the potential influence of parenting on child temperament. In this section, the impact of temperament on parenting and of parenting on temperament, along with some of the pivotal research investigating the interactive effects of child temperament and parenting on social developmental outcomes, are reviewed. While it is frequently postulated that child temperament and parenting are linked (e.g. Rubin & Stewart, 1996)33, the exact nature of these associations is often difficult to specify. In addition, the small amount of empirical evidence of such links which is available is often difficult to interpret because of four methodological problems. First, connections between temperament and parenting may be explained by the genetic and biological similarity of parent and child (likely to be reflected to some extent in the child’s temperament), rather than the direct influence of temperament on parenting or vice versa (Scarr, 1992)34. Second, the extensive use of parent report data to assess both child temperament and parenting means that underlying parental characteristics may influence both sets of data. Third, given that child temperament is likely to be influenced by parenting from very early in the child’s life, associations between concurrent parenting and child temperament could be the result of earlier parenting history. Finally, conclusions about the causal relations between temperament and parenting often cannot be drawn because studies have used only co-relational data. Hence, the results of studies reporting links between temperament and parenting need to be interpreted with care.

Some researchers have investigated the associations between temperament (categorized as problematic or not) and both IBPs and EBPs (categorized as the presence or absence of disorder). For example, in a sample of adolescents. Windle

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(1992) categorized high activity, low rhythmic city, poor task orientation, low approach, negative mood and inflexibility as problematic. Temperamental risks for depression were similar for boys and girls and included inflexibility and negative mood (i.e. negative emotionality), as well as low approach. The most notable risks for delinquency were high activity and low task orientation (or persistence) for boys and girls, and for girls only, inflexibility. As the number of problematic temperament styles increased so did the incidence of disorder, particularly for depression. Moderational and mediational models were also investigated and some support for a mediational model was found, in that temperament difficulty contributed to depression and delinquency both directly and indirectly through support from family and friends.

Among research on the contribution of temperament to positive social functioning, the series of studies by Eisenberg and colleagues has highlighted the importance of emotionality and self-regulation for pro-social behaviours and capacities, as well as gender differences in these relationships. For example, Eisenberg et al. (1993) showed that self-regulation capacities and negative emotionality were powerfully related to a composite measure of social skills derived from parent, teacher and observer report, with self-regulations appearing more salient. High negative emotionality was found to be a risk factor for low social skills for both boys and girls, while low negative emotionality was protective, but only for boys. The presence of temperament-by-temperament interactions was suggested by the finding that children who were both highly emotional and poorly regulated had the lowest levels of social skills and peer socio-metric status.

Zentrier (1993) compared recent findings of temperament research with Jung’s observations on the genesis of introversion and extraversion. He found evidence of distinct neuropsychological profile, a notion which agrees with Jung’s

hypothesis that introversion and extroversion have a biological foundation was found with both temperament types. Also similarities between Jung’s theory and the hypothesized correlation between temperament and psychopathology exist.

Girls are consistently found to have higher levels of empathy, sympathy and conscience development than boys and numerous sex differences are apparent in the connections between temperament and these aspects of functioning. In a sample of toddlers and preschoolers, Kochanska, DeVet, Goldman, Murray, and Putnam (1994)\(^{38}\) identified two higher order components of conscience: Affective Discomfort (e.g., anxiety, guilt, remorse about wrongdoing) and Moral Regulation / Vigilance (e.g., confession, reparation following wrongdoing). Consistent with other research, Affective Discomfort was higher for girls than for boys. For girls, it was predicted by higher reactivity and focus / effortful control (i.e., attentional regulation), whereas no temperament dimensions were predictive for boys. High focus/effortful control was associated with higher Moral Regulation/Vigilance for both boys and girls. Different temperament dimensions were related to lower of Moral Regulation / Vigilance, with reactivity being prominent for girls, and impulsivity and sensation seeking for boys. Gender differences in the temperamental predictors of empathy were also found by Bryant (1987)\(^{39}\), with emotional intensity and low suitability associated with higher empathy only for girls. More systematic investigation of gender-specific pathways to positive outcomes is clearly required. A large body of research shows that temperament directly affects peer relationships, the most common finding being that temperamental inhibition predicts withdrawal from peers. Studies on the associations between temperament and peer relationships have extended across a wide age range, beginning in infancy and continuing into adolescence.

A number of researchers have investigated the contribution of temperament to children’s academic achievement, which is outside the purview of this review. In brief, poor achievement has been found to be related to higher activity, distractibility

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and lower persistence, all of which are aspects of self-regulation and lower adaptability (Guerin, Gottfried, Oliver & Thomas, 1994\textsuperscript{40}; Martin, 1989)\textsuperscript{41}, as well as negative reactivity (Lerner, Lerner, & Zabski, 1985)\textsuperscript{42}. These relationships held after intelligence was controlled. Adaptive and problematic classroom behaviours have been linked to temperament style. Martin, Nagle, and Paget (1983)\textsuperscript{43} showed that activity, persistence and distractibility were related in expectable ways to observations of constructive and non-constructive classroom behaviour. Guerin et al. (1994)\textsuperscript{44} found that between 25\% and 30\% of variance in classroom behaviour, assessed by teacher ratings of ability to work hard and appropriateness of behaviour, was explained by temperament style, with persistence being the most powerful contributor and adaptability and approach also featuring. Negative emotionality has also been linked to children’s behaviour in the school context. Teacher-reported EBPs at 8 years of age were strongly predicted by parent-reported negative emotionality at 5 years of age, as were positive social behaviours, although much less powerfully (Nelson, Martin, Hodge, Havill, & Kamphaus, 1999)\textsuperscript{45}.

Further confirmation of the impact of culture on temperament and social development relationships comes from evidence that temperamental inhibition is associated with positive developmental outcomes in China, in direct contrast to North American findings (Chen et al., 1995)\textsuperscript{46}. Children aged 8 to 10 years who were identified by peers as inhibited, were also more accepted by peers and rated more


positively by teachers and peers on ‘honourship’ and leadership than were average or aggressive children. Differing connections between inhibition and parenting style have also emerged in studies of Chinese and Canadian samples (Chen et al., 1998)\(^{47}\). Toddler inhibition was positively related to maternal acceptance and encouragement of achievement in the Chinese sample, whereas the correlations were negative for the Canadian sample. Together, these results suggest a higher valuing of inhibition in the Chinese culture by comparison with the Canadian culture. These findings require replication and are somewhat inconsistent with more recent work concerning social withdrawal using a younger sample of Chinese children (Hart et al., 2000)\(^{48}\). However, they do point to the cultural relativity of the impact of temperament on social development.

Twin studies have been conducted to identify the extent to which genetic and environmental effects are involved. A recent US twin study found that there were no genetic effects on antisocial traits during adolescence, but important genetic effects on antisocial traits during adulthood (Lyons, True, Eisen, Goldberg, Meyer, Faraone et al., 1995)\(^{49}\). The authors concluded that the similarity of antisocial behaviour during adolescence was mainly due to family environments, while the similarity during adulthood, when siblings have left the common family environment, was due to genetic similarity. This evidence underlines the truth of the statement that ‘young children with the highest degree of temperamental and cognitive predisposition (to aggression and antisocial behaviour generally) are usually raised in families that are ill-prepared to provide child-rearing that could prevent the development of antisocial behaviour (Lahey, Waldman & McBurnett, 1999)\(^{50}\).


Some aspect of temperament seem to be general risk factors for maladjustment. Rubin, Coplan, Fox and Calkins (1995)\(^5\) found that a group of poorly regulated, low sociable preschoolers had more IBPs than children in highly regulated, low sociable and average groups. Poorly regulated, highly sociable children had more EBPs than the other groups. These findings suggest that emotional dysregulation may be a nonspecific risk factor for both IBPs and the type of adjustment difficulty exhibited may be influenced by other temperament factors, such as sociability.

Wills and colleagues have investigated the connections between temperament and adolescent substance use in several large cohort studies (Wills, DuHamel & Vaccaro, 1995\(^5\); Wills, Windle & Cleary, 1998\(^5\)). Findings consistently indicate indirect linkages, with temperament dimensions such as activity, mood, negative emotionality and sociability being mediated by other aspects of functioning such as self-control (conceptually similar to emotion regulation), maladaptive coping styles, novelty seeking and academic competence and by environmental factors such as negative life events and deviant peer affiliations. Somewhat similarly, examination of the earlier histories of 15 to 16 year old participants in the Australian Temperament Project showed that high negative reactivity, high sociability, low persistence (as well as aggression, school difficulties and deviant peer affiliations) were significant risk factors for later substance use (Williams, Sanson, Toumbourou & Smart, 2000\(^5\)).

Gender differences in the associations between temperament and peer relationships have been somewhat under-examined. For example,Sans, Smart, Prior and Oberklaid (1996)\(^5\) examined the preschool temperament characteristics that

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differentiated children classified (on the basis of parent, teacher and self-report) as having problematic, competent or average peer relationships at 11 to 12 years. Low persistence and poor task orientation (low self-regulation), assessed from 1 to 3 years onwards, differentiated between problem boys and average or socially skilled boys, but not girls. Higher irritability and inflexibility (aspects of reactivity) between 1 to 3 and 9 to 10 years discriminated between the problem group and other groups for both sexes, but more powerfully for boys than for girls.

Mehrabian, Yound and Sato (1998)\textsuperscript{56} reviewed the literature on emotional emphatic tendency, defined as an individual’s characteristics inclination to respond with emotions similar to those of others who are present. They found that more emphatic persons were found to be more aronsable and more pleasant. Greater skin conductance and heart rate responses of more emphatic persons to emotional stimuli confirmed their greater reusability.

In contrast to findings that parents withdraw from temperamentally irritable and demanding children, others have found that parents invest more positive efforts with their irritable and demanding children. For example, Rubin, Hastings, Chen, Stewart and McNichol (1998)\textsuperscript{57} reported that very young boys with poor behavioural and emotional regulation (i.e. low anger / frustration tolerance and low self-control) received higher levels of both maternal warmth and negative dominance (negative control and hostile affect). Sanson and Rothbart (1995)\textsuperscript{58} argued that age of child and parental attributions may be critical factors in determining whether parents invest in more or less positive parenting with their ‘difficult’ children. Initially enhanced parenting may be difficult to sustain over time, and parents may come to perceive ‘difficulty’ as intentional rather than intrinsic. The differing ways in which parents respond to their child’s ‘difficult’ temperament are likely in turn to impact on the child’s social developmental outcomes.


Mehrabian (1998) studied differentiation of anxiety from depression. It was found that both anxiety and depression shared unpleasant and submissive temperament characteristics but different because anxiety involved more arousability than depression.

There is good evidence of a strong genetic component in liability for hyperactive behaviour, attention span, prosocial behaviour and the ability to inhibit behaviour during infancy, toddlerhood and the preschool period.

Few studies have investigated links between temperament and depression, Katainen, Raeikkoenen and Keltikangas-Jarvinen (1999) investigated pathways from 15-year-old temperament and perceived social support to depressive tendencies at 20 years of age. Pathways to depression differed for males and females. After controlling for the effects of depression at 15 years, low sociability predicted depression for boys, whereas for girls the pathway from low sociability to later depression was indirect and mediated by social support. These findings emphasize the importance of investigating both direct and indirect effects of temperament on social functioning, as well as examining gender differences.

In a study of multiple social development outcomes (EBPs, IBPs and social skills), Paterson and Sanson (1999) investigated temperament by parenting interactions, as well as the ‘goodness of fit’ between the characteristics of 5 to 6 year-old children and their environments. ‘Good fit’ was conceptualized as a child processing characteristics which matched the demands of his/her environment (e.g. parental expectations). Fit was assessed by seeking parent reports of social, behavioural and cognitive child characteristics that they would find ‘bothersome’, as well as ratings of their own child on these characteristics. ‘Poor fit’ occurred when a child displayed a high frequency of behaviours rated ‘bothersome’ by the parent. Both additive and interactive effects were found for EBPs, with temperamental inflexibility (including negative reactivity) and punitive parenting directly predicting EBPs, as did

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the interaction between these two variables (i.e., the combination of high inflexibility and high punitive parenting). For combined parent and teacher reports of social skills, greater attention regulation (or persistence), higher levels of parental warmth, and better ‘fit’ predicted high levels of social skills. For aggregated parent-teacher report of IBPs, only inhibition was predictive.

Associations between peer relationships and other aspects of temperament (e.g. emotionality and self-regulation have also been studied. Dunn and Cutting (1999)\(^6\), using a sample of preschoolers, investigated concurrent relationships between temperament and quality of interactions with a friend. Negative emotionality was positively correlated with several aspects of the interaction, such as ‘coordinated play’ (e.g. agreeing with the other child’s suggestion) and ‘bids’ (unsuccessful attempts to gain attention). While the later is clearly a negative outcome, the surprising association between high reactivity and coordinated play suggests that this type of play may reflect dependency rather than peer competence.

The direct contributions of temperament to children’s capacity for sympathy were investigated by Murphy, Shepard, Eisenberg, Fabes and Guthrie (1999)\(^6\). High negative emotionally assessed concurrently and 2 and 4 years previously was related to low teacher-reported sympathy in preadolescence and concurrently to low parent-reported sympathy. High regulation was related to high teacher and parent reported sympathy. Here, as in Esienberg et al. (1993)\(^6\), self-regulation capacities appeared more salient than negative emotionality. Consistent with the North American studies reviewed above, Australian Temperament Project data have identified attentional self-regulation, sociability and reactivity as predictors of social skills at 11 to 12 years assessed concurrently by parent, teacher and child report, explaining almost half of the variance. Longitudinal predictors of this social skills measure were task orientation and flexibility (attentional and emotional self-regulation) at 5 to 6 and 7 to

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8 years, with 16 to 20% of the variance explained (Prior, Sanson, Smart & Oberklaid, 2000)\(^65\).

The moderating effect of context on connections between temperament and social competence was revealed by Fabes et al. (1999)\(^66\) using naturalistic observations of preschoolers. Individual differences in temperament characteristics were more influential in stressful or intense contexts, with well-regulated children better able to maintain socially competent behaviour. In more low-key, relaxed contexts, most children responded in socially competent ways, regardless of their temperament.

Two influential sets of studies on social withdrawal in early childhood have been conducted by Kagan and colleagues and Rubin and colleagues, respectively. For these authors, social withdrawal (or reticence) refers to consistent displays of solitary, on looking and unoccupied behaviours when with familiar or unfamiliar peers (Burgess, Rubin, Cheah & Nelson, 2001)\(^67\). In attempting to explain the links between temperament and peer relations, some authors (e.g. Kagan, Rothbart) have referred to the physiological theories. Others (e.g. Rubin and colleagues) argue that inhibition gives the child fewer opportunities to interact with others (i.e., peers, adults), particularly if they receive overprotective parenting. Due to their limited interactions with others, these children are less likely to learn how to interact effectively with peers. This may lead to rejection from the peer group and further isolation.

Recent research using more sophisticated methods has documented compelling evidence that early childhood temperament have a pervasive and powerful influence over behaviour and personality structure throughout development (Caspi, 2003).

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In a particularly impressive study, a team of researchers in Dunedin, New Zealand, investigated the health, development and personality of over 1000 children born during a one-year period. These individuals were examined approximately every two years, with an impressive 97% remaining in the study through their 21 birthdays (Silva and Stanton, 1996). Children were classified at three years of age into temperamental types based on examiners' ratings. The researchers found five temperament types, three of which were remarkably similar to those described by Chess and Thomas, although named “Well-adjusted” (easy), “Undercontrolled” (difficult) and “inhibited” (Slow-to-Warmup). The classification of children at age 3 predicted personality structure and a variety of behavior in early childhood. For instance, those judged under controlled at age three were later more likely to have alcohol problems, to be criminals or employed, to attempt suicide, to be antisocial and anxious and to have less social support. Inhibited children were much more likely to become depressed.

Lengua, Wolchik, Sandler and West (2000) also found both direct and interactive effects of temperament and parenting in a study of children who had experienced parental divorce. Low positive emotionality and high impulsivity, together with high parental rejection and high inconsistency, predicted conduct problems, all assessed by composites of parent and child ratings. For depression, high negative emotionality and low positive emotionality, as well as parental rejection and inconsistency, were predictive. There was a stronger relationship between parental rejection and adjustment difficulties (both conduct problems and depression) for children low in positive emotionality than for children moderate or high in positive emotionality. Inconsistent parental discipline had a stronger association with both types of adjustment problems for children high in impulsivity than for children moderate or low in impulsivity.

A large scale NICHD study in the US found significant effects of child care related to the quality of the care that the child attended (Vandell & Wolfe, 2000). Not surprisingly, where the quality of care was high, there were fewer reports of behaviour problems than where it was low. However, the longer the child had been in care, the more behaviour problems were reported. Of great concern were findings from the same data set, reported by Belsky, Weinraub, Owen & Kelly (2001) showing that children who attended child care, regardless of its quality, were more aggressive on starting school. In addition, the more hours of care that children attended, the more aggressive they were likely to be on starting school.

Several large longitudinal studies from the US (Campbell, Shaw & Gillion, 2000), England (Deater – Deckard and Dunn, 1999) and Australia (Prior, Sanson, Smart & Oberklaid, 2001) have found consistent correlations between infant temperament, parenting styles and later behavioural problems. Infants with difficult temperament, that is, infants who are irritable, have strong negative emotional reactions, lack persistence, are overactive and difficult to soothe, may be at greater risk for conduct disorder and anti-social behaviour in early and middle childhood. Whether these difficult infants do, in fact, become distressed is assumed to relate to the quality of parenting. Insecure parent-child relationship and / or parenting styles that are harsh, inconsistent and coercive are related to poor outcomes in children. (Belsky, Woodworth and Crnic, 1996; Campbell, Pierce, Moore, Marakovitz & Newby, 1996, Campbell, Shaw & Gillon, 2000).

In general, the focus of studies of links between temperament and parenting has been on distress-related temperament attributes (e.g., irritability, ‘difficultness’, negative reactivity), which tend to covary with parental punishment / power assertion, low levels of positive parenting and general unresponsiveness, and are related to EBPs (e.g. Hemphill & Sanson, 2000\textsuperscript{79}; Hinde, 1989\textsuperscript{80}; Van den Boom & Hoeksma, 1994\textsuperscript{81}). Associations between the child’s positive affect and self-regulation and parental responsiveness, social interaction and use of rewards have also been reported (e.g. Hinde, 1989; Kyrios & Prior, 1990\textsuperscript{82}). For example, Spangler (1990)\textsuperscript{83} found that low levels of ‘difficult temperament’ at 12 months of age (the sum of approach, adaptability, intensity, mood and rhythmicity dimensions) were associated with observed maternal responsiveness at home during the child’s second year, which in turn was related to high levels of observed social competence at 2 years of age (e.g., positive interactions with mother and stranger). Recent investigations have also shown that child inhibition tends to be associated with parental over control and over protectiveness (e.g. Rubin et al., 1997\textsuperscript{84}), which is thought to reinforce social wariness, fostering the development of peer withdrawal (e.g. Rubin & Stewart, 1996\textsuperscript{85}).

Using socio-metric data and assessing a range of temperament dimensions, Walker (2001)\textsuperscript{86} found that preschoolers who were rejected by their peers scored

higher on concurrent teacher ratings of activity and distractibility and lower on persistence than popular children. Compared with popular children, preschoolers in both rejected and neglected groups showed more negative mood and less adaptability at school. Preschoolers classified as controversial (highly liked by some peers but highly disliked by others) were less inhibited than rejected, neglected and popular children. Overall, the more ‘difficult’ temperament characteristics were associated with more negative socio-metric status.

Two studies used a categorical approach to investigate interactions between temperament, family environment and child functioning. Groups were formed on the basis of presence or absence of a problematic temperament characteristics (e.g. reactivity) and / or a problematic parenting style (e.g. low warmth) or poor parent-child fit. Using ATP data, Smart and Sanson (2001)\textsuperscript{87} investigated children’s social competence at 11 to 12 years, assessed via a composite of parent, child and teacher ratings. While competence was related to both temperamental difficulty (e.g. high reactivity, low attention or emotion regulation) and poor parent-child fit from toddlerhood through 7 to 8 years, there were also interaction effects. The group with both problematic temperament and poor fit had significantly lower social skills at 11 to 12 years than the groups with only one of these problems, who in turn had lower social skills than the group with neither problem.

Hemphill and Sanson (2001)\textsuperscript{88} followed a group of 112 children from 2 to 4 years in a study that included detailed laboratory observations as well as parent ratings. High reactive children who showed significantly higher rates of EBPs at 4 years had experienced poorer parenting (low parental warmth, high punishment or low inductive reasoning) at 2 years of age than similarly reactive children who did not show later behaviour problems. Children who scored low on inhibition (i.e., were highly sociable) and who exhibited EBPs at 4 years had received higher levels of punishment as toddlers than highly sociable children who did not show later EBPs. Similar findings emerged from a study of two cohorts of children (infants followed to 10 years of age and 5-year-olds followed through mid-to late childhood by Bates, 


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Pettit, Dodge, and Ridge (1998)\(^89\). They found that temperamental resistance (e.g. continues to play when told to leave objects alone) was more strongly associated with EBPs in children receiving low restrictive control from their parents than children who received high restrictive control from their parents.

Shafer (2001)\(^90\) too examined the relation of big five markers to the EASI temperament scales and the Thurstone Temperament Schedule by using principal components, canonical and regression analysis. In study – I it was found that the EASI sociability, emotionality and impulsivity scales appear to be parallel to the big five extraversion, neuroticism and conscientiousness scales. In Study – II it was found that the Thurstone Reflective and emotionally stable scales appear to be roughly parallel to the big five’s openness and neuroticism scales.

Researchers are unlikely to find simple cause effect links between individual genes and observable child behaviour. Behavioural characteristics such as sociability and emotionally are most likely influenced by multiple rather than of single genes, with individual genes contributing small effects (Plomin, DeFries, Craig & McGuffin, 2003)\(^91\). Even multiple genes operating in concert do not guarantee that a child will exhibit a certain temperamental characteristic; they merely increase the odds that this will be the case. The concept of “constraint” is helpful here. Kagan (2003)\(^92\) suggests that some genetic factors may place a restriction or constraint on the probability of a certain outcome, rather than determining a particular behavioural trait.

The literature provides convincing evidence that physical aggression runs in families. Physical aggression of boys at two years of age was found by Keenan and Shaw (1994)\(^93\) to be predicted by a history of family criminality. Youths who engage

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in high levels of antisocial behaviour are much more likely than other youths to have a biological parent who also engages in chronic antisocial behaviour (Farrington, 1995\(^94\); Lahey, Hartdagen, Frick, McBurneth Conner & Hynd, 1988)\(^95\).

Vilfredo, Enrica, Patrizia and Fabiola (2004)\(^96\) experimentally validated joint sub system hypothesis of Gray’s theory of anxiety and impulsivity. It asserts that anxiety is associated with high sensitivity to signals of punishment and impulsivity with high sensitivity to signals of punishment and impulsivity with high sensitivity to signed of reward. For pleasant and unpleasant target words the following measures were obtained:

1. Peak amplitude and latency of the P3 ERP component.
2. Heat Rate Change
3. Reaction Fine
4. Emotional Feelings Rating

The result showed higher P3 peaks over parietal and occipital leads when target words had an opposite emotional valence to standard ones. Across frontal and temporal recording sites, P3 amplitude was larger in high anxiety subject than in low anxiety ones for unpleasant words, suggesting higher sensitivity to negative emotions. High anxiety subjects also displayed higher emotional ratings. These findings, however, appear in tune with the “joint subsystem” hypothesis that predicts a lower level simitivity to signals of punishment in high impulsivity subjects.

Ane (2004)\(^97\) assessed the factor structure and psychometric problems of the emotionality, activity and sociability (EAS) temperament survey (Buss and Plomin, 1984)\(^98\) for adult women. The results indicated an acceptable fix for the basis


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Theoretical (EAS model, implying that the scale is functioning satisfactory. The results also suggest that the measure could be improved across fine, latent stability factor explained with in scale conversations. Both Latent stability factor and time specific factors accounted for cross sectional covariance between subscales.

Vierikko, Pulkkinen, Kaprio and Rose (2004)\(^9\) examined genetic and environmental contributions to the covariance between aggression and hyperactivity. Impulsivity was related by twin’s teachers and parents. In addition to significant genetic and environmental influences specific to each behaviour aggression and hyperactivity impulsivity share common genetic and environmental etiology.

The purpose of Remireg and Andrev (2005)\(^10\) study was first to offer a few theoretical consideration on the concept of human aggression and its main types and second to analyze the relationship between those types of aggression and other related psychological constructs, such as anger, hostility and impulsivity. This study indicated: most classification in the literature show two kinds of aggression, namely, hostile aggression and instrumental aggression. Anger and different kinds of aggression were positively correlated with hostility but not with instrumental one. In sum, measured by self reports.

Aksan and Joy (2007)\(^11\) demonstrated that temperamentally more fearful children experiencing high level of parental power assertion, should more cheating behaviour during game then did temperamentally less fearful children.

\(^9\)Vierikko, E., Pulkkinen, L., Kaprio, J. and Rose, R.J. (2004), Genetic and Environmental Influence on the Relationship Between Aggression and Hyperactivity – Impulsivity as Rated by Teachers and Parents, Department of Psychology, Jyvaskyla, Finland. 7 (3), 261-274.
