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Larissa M. Gaias
Bowdoin College

Katri Räikkönen
Helsingin Yliopisto

Niina Komsu
Helsingin Yliopisto

Maria A. Gartstein
Washington State University Pullman

Philip A. Fisher
Oregon Social Learning Center

See next page for additional authors

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Authors

Larissa M. Gaias, Katri Räikkönen, Niina Komsa, Maria A. Gartstein, Philip A. Fisher, and Samuel P. Putnam

Development and Aging

Cross-cultural temperamental differences in infants, children, and adults in the United States of America and Finland

LARISSA M. GAIAS,¹ KATRI RÄIKKÖNEN,² NIINA KOMSI,² MARIA A. GARTSTEIN,³ PHILIP A. FISHER⁴ and SAMUEL P. PUTNAM¹

¹*Bowdoin College, Brunswick, Maine, USA*

²*University of Helsinki, Helsinki, Finland*

³*Washington State University, Pullman, Washington, USA*

⁴*Oregon Social Learning Center, Eugene, Oregon, USA*

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Cross-cultural differences in temperament were investigated between infants ($n = 131$, 84 Finns), children ($n = 653$, 427 Finns), and adults ($n = 759$, 538 Finns) from the United States of America and Finland. Participants from both cultures completed the Infant Behavior Questionnaire, Childhood Behavior Questionnaire and the Adult Temperament Questionnaire. Across all ages, Americans received higher ratings on temperamental fearfulness than Finnish individuals, and also demonstrated higher levels of other negative affects at several time points. During infancy and adulthood, Finns tended to score higher on positive affect and elements of temperamental effortful control. Gender differences consistent with prior studies emerged cross-culturally, and were found to be more pronounced in the US during childhood and in Finland during adulthood.

Key words: Temperament, cross-cultural, United States, Finland, infants, children, adults.

Sam Putnam, Department of Psychology, Bowdoin College, Brunswick, ME 04011, USA. E-mail: sputnam@bowdoin.edu

INTRODUCTION

Temperament has been defined as individual differences in reactivity and self-regulation, influenced by heredity, maturation and experience (Rothbart & Derryberry, 1981), where reactivity refers to tendencies to become aroused to stimuli and self-regulation modulates reactivity (Rothbart, 1989). Differences in temperament are found as early as infancy and have been shown to remain relatively stable thereafter. Although the genetic basis of temperament is often emphasized, temperament and personality profiles in individuals from different cultures may also be shaped by societal norms, moral climates, group dynamics, typical child-rearing practices and values, and expectations regarding traits, which differ substantially across cultures. Although Western samples are typically used as norms for understanding developmental trends, it is important to recognize that generalizability of such trends may be limited if no consideration is given to the differing values and practices experienced in different countries. Since US samples are often used to establish such norms, cross-cultural research often focuses on comparisons between the US and other countries of interest.

The current study examines differences in temperament between Finnish and American infants, children and adults. To our knowledge, only a single study has compared temperament attributes between individuals from the United States and Finland. Miettunen, Kantojarvi, Veijola, Jarvelin, and Joukamaa (2006) examined differences in adults across multiple countries on the dimensions of novelty seeking, harm avoidance, reward dependence, and persistence, as assessed with the Tridimensional Personality Questionnaire (TPQ; Cloninger, 1987) and the Temperament and Character Inventory (TCI; Cloninger, Svrakic &

Przybeck, 1993). When compared to Finns, American adults scored much higher on persistence and reward dependence, but individuals from the two countries were almost identical in terms of harm avoidance and novelty seeking. Additional temperamental comparisons in infancy have been studied between the United States and Finland's neighbors to the east: Russian infants scored significantly lower on vocal reactivity and positive emotionality, but higher on measures on fear and negative affect than American infants (Gartstein, Slobodskaya & Kinsht, 2003; Gartstein, Slobodskaya, Zylicz, Gosztyla & Nakagawa, 2010).

According to Rothbart, Ahadi, and Evans (2000), temperament is the genetic endowment that informs individual differences in personality as one develops. Therefore, temperament measures have been used to gain a deeper understanding of personality traits, especially those outlined in models referred to as the "Big Five" or "Five Factor Model" (FFM), which have emerged as prominent models for classifying personality (Goldberg, 1990; McCrae & Costa, 1987). Confirming the integrated nature of these constructs, significant similarities have been found between temperament and personality instruments and their resulting factors (Rothbart *et al.*, 2000). Because personality is presumed to emerge from temperament, cross-cultural variability in personality should inform expected differences in temperament. As argued by Markus and Kitayama (1998), personality can be influenced by a given culture's view of the importance of expressing particular personality traits or even the value of an individual's personality in the context of the larger society in general. To our knowledge, no research in this vein has explicitly compared Finns to Americans. Comparisons have been made, however, between FFM scores of Americans and citizens of Finland's geographical neighbors. McCrae and Terracciano (2005) found that individuals from

other Nordic countries tended to score higher than Americans on Neuroticism, Openness to Experience, and Agreeableness, but lower on measures of Extraversion. Similar results emerged for Russians, except that Russians scored lower than Americans on Openness to Experience.

A primary limitation of existing studies examining cross-cultural differences in temperament or personality is a reliance on a single age group. The current study addresses this shortcoming by examining differences at three different ages spanning a large segment of the lifespan, providing an opportunity to examine how aspects of temperament may develop differently over time in distinct cultures. A second advance represented by the current effort is the utilization of instruments which are more detailed than those used by Miettunen *et al.* (2006) or McCrae and Terracciano (2005). The questionnaires used in the current study were developed in reference to Rothbart's (Rothbart & Bates, 2006; Rothbart & Derryberry, 1981) conceptualization of temperament. Rothbart's approach to temperament is inclusive of a wider variety of influences than those of other temperament theorists, who focus primarily on behavioral tendencies, as opposed to including neural and physiological factors as well. Her integrated approach also allows for a more dynamic concept of temperament, with models that capture early-appearing traits, but allow enough flexibility to recognize developmental change over time (Putnam & Stifter, 2008). This conceptualization, as articulated by Rothbart and Derryberry (1981), provided the basis for a battery of tests to measure temperament across all ages, including those employed in the current investigation. Longitudinal studies have explored stability using Rothbart's instruments between infancy and childhood (e.g., Komsí, Rääkkönen, Heinonen *et al.*, 2008; Komsí, Rääkkönen, Pesonen *et al.*, 2006; Putnam, Gartstein & Rothbart, 2008; Rothbart, Derryberry & Hershey, 2000), but no studies to date have attempted to connect the questionnaires through adulthood.

In infancy, we employed the Infant Behavior Questionnaire (IBQ; Rothbart, 1981), which includes scales assessing Activity Level, Soothability, Fear, Distress to Limitations, Smiling and Laughter, and Duration of Orienting. In childhood, the Children's Behavior Questionnaire (CBQ; Rothbart, Ahadi, Hershey & Fischer, 2001) measures 15 dimensions subsumed within three larger factors: Negative Affect, Surgency, and Effortful Control, which bear similarity to the FFM constructs of Neuroticism, Extraversion, and Conscientiousness, respectively. For adults, the Adult Temperament Questionnaire (ATQ; Evans & Rothbart, 2007) assesses 16 dimensions associated with these same three factors, as well as an additional Orienting Sensitivity factor.

Cultural dimensions and historical influences

Cultural dimensions, as developed by Hofstede (2001), may provide one source of potential hypotheses regarding cross-cultural differences. Hofstede (2001) ranked over 50 countries, including Finland and the United States, on five cultural dimensions: Power Distance, Individualism, Masculinity, Uncertainty Avoidance, and Long-Term Orientation. Substantial differences between Finland and the US have been reported for three of these factors.

The United States scores very high on rankings of Individualism and Masculinity, whereas Finland, although also considered

an individualist country, scores moderately on these dimensions. Previous studies have shown that Individualism and Masculinity, while conceptually distinct, are associated with one another. For instance, Andreja (2003) connected Femininity to interdependent views of self (Collectivism) and Masculinity to independent views of self. Individualistic cultures tend to emphasize independence, exploration, and self-reliance; in contrast, individuals in Collectivist cultures focus on context and are less concerned with consistency and self-enhancement (Triandis, 2001). Relating these cultural dimensions to temperament/personality, Individualism has been linked to high scores on three of the FFM personality traits: Extraversion, Openness to Experience, and Agreeableness (McCrae & Terracciano, 2005). Masculinity has been associated with high Extraversion and low Neuroticism, as well (Francis & Wilcox, 1998).

The Finnish culture was also characterized as higher in Uncertainty Avoidance, relative to the US (Hofstede, 2001). Uncertainty Avoidance refers to the degree to which a country sets strict rules and boundaries with the goal of reducing citizens' exposure to novel or unstructured situations that could incite stress. As expected, McCrae and Terracciano (2005) found that Uncertainty Avoidance was linked to high levels of Neuroticism, and Lynn and Hampson (1975) found associations between Uncertainty Avoidance and anxiety and stress. In two studies examining anxiety levels in Scandinavian countries through examinations of childhood pressures and demographic influences, Finland scored higher than the other countries (Kata, 1975; Lynn & Hampson, 1975).

In sum, based on Hofstede's differential rankings of Finnish and American cultures of Individualism, Masculinity, and Uncertainty Avoidance, we expected Americans to score higher on Surgency, especially its behavioral components, and Finns to score higher on Negative Affect and Effortful Control. Because Hofstede's analyses were conducted with data collected in adults, the results of prior studies may be particularly predictive of adult temperament. However, because these broad social norms may influence individuals' experiences from the earliest days of life, we anticipate that the influence of these cultural norms may extend to all age groups.

Developmental influences

Cultural influences are translated into group differences in personality in several ways. Ecological systems theory (Bronfenbrenner, 1979) suggests that children can be influenced by subtleties in systems ranging from immediate familial relationships to general cultural norms or even historical events, with change in any of these ecosystems causing a ripple effect that shapes the individual. Super and Harkness (2002) have coined the term "developmental niche" to conceptualize how a child's environment is shaped by culture. The developmental niche contains three components: the physical and social settings of the child's life, culturally regulated practices of child-rearing and care, and the psychology of the caretakers. These three components interact with one another, and with the child, to account for individual differences.

Child care arrangements represent a primary component of physical and social settings. In Finland, parents are provided with financial and professional incentives whether they choose to send

their children to federally subsidized day cares or stay home with them, which allows for greater flexibility when making decisions about early child care. During the first year of life, practically all Finnish children (99%) are cared for by their parents at home, and about 60% of children under 5 years are in daycare (Kauppinen & Niskanen, 2007; MSAH, 2006). On the other hand, only 20% of children under the age of five stay home with a parent in the United States (US Census Bureau, 2005). Children who spend more time in non-familial care tend to score higher in positive social interaction and social confidence (Farber & Egeland, 1982; Rubenstein & Howes, 1983; Schindler, Moely & Frank, 1987). However, childcare can also lead to higher levels of aggression and behavioral problems (Belsky, Burchinal, McCartney, Vandell, Clarke-Stewart & Owen, 2007; Haskins, 1985). Therefore, in comparison to Finnish youth, American infants and children, who are more frequently cared for by non-familial caregivers, may exhibit higher levels of general negativity, but lower levels of social inhibition.

Regarding parental psychology, consistent with the non-gendered nature of Finnish policies allowing for both paternal and maternal leaves, gender roles in parenting are more egalitarian in Finland than in the United States. Whereas Finnish parents take on very similar disciplinary roles within the home, American fathers deal with facts and discipline, whereas mothers tend to emotions and feelings (Paulson & Sputa, 1996; Pipp, Shaver, Jennings, Lamborn & Fischer, 1985; Youniss & Smollar, 1985). In addition, Hofstede (1991) has found that Finland's parents in general tend to be more feminine in comparison to Americans, who score higher on masculine parenting techniques. We can expect that the less emotionally supportive parenting that American children do experience, especially from fathers, may have an effect on temperament. Park, Belsky, Putnam, and Crnic (1997) found that children who had less sensitive fathers at age 2 and more intrusive and negative fathers at age 3 were less inhibited than their peers. Alternatively, harsher and more punitive parenting may activate neural circuitry implicated in fear, known as the Behavioral Inhibition System (BIS; Gray, 1981, 1987), which could result in greater non-social fearfulness and negative affect in American children.

Differences in parental goals can also be seen between the United States and Finland. American children tend to be raised to be exuberant, successful, independent, assertive and autonomous (Lebra, 1994), which could lead to higher levels of extraversion and surgency. On the other hand, Finnish parents tend to regard values of hedonism, the motivation to pursue pleasure and the satisfaction of sensual needs, as most important in child rearing (Tulviste & Ahtonen, 2007), while also promoting patience, thoughtful speech, and proper reservation (Carbaugh, 2005). These parental goals may contribute to high levels of positive affect and effortful control among Finns.

Current study

Whereas cross-cultural examinations of temperament and personality are typically limited to a single age group, the present study hopes to shed light on potential mechanisms influencing individual differences by utilizing temperament data collected from the United States and Finland across three different age groups:

infants, children, and adults. Differential effects across these ages can provide insight as to how cross-cultural distinctions emerge, and possibly change over time. Differences that are consistent across the three time points may suggest genetic factors or stable individual differences shaped by very early rearing differences. Alternatively, if later environmental input influences expression of traits, we would expect to see more pronounced cross-cultural differences in these traits as age increases, as older individuals become more integrated into their culture and adopt specific norms from others around them. Differences that are apparent at certain ages, but not others, may be due to contextual factors that are only relevant at those points in the life course. For instance, the children in our American sample had already begun formal school, whereas compulsory education in Finland had not been initiated at the age our sample was studied. Therefore, we may expect to see differences in childhood as a result of the school context, or lack thereof.

We also anticipate finding gender differences between cultures. The United States is known to be a more gender-polarized country than Finland, with larger distinctions between males and females. Nordic cultures in general tend to express more egalitarian views regarding gender differences than Americans (Kalin & Tilby, 1978). Hofstede (1991) found that Americans are often socialized to accept more distinct gender roles because of their parents' differentiated duties within the home. This modeling leads to emphasizing assertiveness in males and pleasantness in females. Therefore, we predict greater gender differences in temperament between American children and adults than among Finnish individuals.

METHODS

Participants and data collection: Finnish sample

Infants. All Finnish participants were derived from an ongoing study on neonatal and early childhood predictors of hypertension development. The initial sample of 1,049 mothers and their infants was recruited in 1998 from one of the main maternity hospitals in the Helsinki, Finland area, with approximately 4,500 births per year. The dyads were a consecutive series of mothers with singleton healthy births in 1998. Sick and preterm babies were not included in the study. During the first year, a psychological follow-up survey was sent to the first 500 recruits. At this time the infants averaged 6 months of age. The Institutional Review Board at the University of Helsinki approved this project, and the participating parents gave their informed consent (see Stranberg, Järvenpää, Vanhanen, & McKeigue, 2001 for details of the recruitment). Mother-ratings of infants who were exactly 6 months old ($n = 84$, 48 girls) were used in the current study. Mothers' ages ranged between 20 and 39 ($M = 29.7$; $SD = 4.1$). All mothers were Caucasian. At that time, all the mothers were on parental leave, taking care of the infant at home. Infant temperament was assessed along with other psychological questionnaires at home.

Children. A further follow-up survey of the above described longitudinal study was sent to the entire initial sample in 2003. Nine-hundred and six participants' addresses were traced through the Finnish Population Register Centre. Of those contacted, 447 (49%) families returned the follow-up questionnaire, with 427 mothers providing complete data on child temperament (220 girls). At that time, the children were on average 5.5 years old ($M = 65.9$ months; $SD = 2.8$ months). Mothers' ages were between 23 and 49 ($M = 35.5$; $SD = 4.69$). The monthly family income was, on average, between €3,000 and €5,000

(\$3,800–\$5,100) at the times of 6-month and 5.5-year data collection points.

Adults. In 2006, a total of 922 mothers of the initial cohort could still be contacted. Of these mothers, a subsample of 414 families was invited by a letter to participate in a follow-up with a focus on individual differences in physical and psychological development (see Rääkkönen *et al.*, 2009). This follow-up data provides adult's self-assessed temperament of 308 mothers and 230 fathers. Mothers' ages were between 26 and 52 years ($M = 38.7$; $SD = 4.6$), and fathers' ages were between 31 and 50 years ($M = 40.4$; $SD = 4.9$).

Participants and data collection: American samples

Infants. Sixty-six parents of infants (33 females) residing in the US agreed to take part in a study of infant temperament. Mothers of 3-month-old infants were recruited via telephone calls made on the basis of birth announcements published in Eugene-Springfield, OR, local newspapers. Sixty percent of the contacted parents agreed to take part in this work. Mothers declining participation cited concerns with the time demands of a longitudinal study. Participating mothers were asked to complete the infant temperament questionnaire three times over the course of the study, when their children were 3, 6, and 9 months of age. Only the 6 month temperament scores were utilized in this study, to provide a match to the Finnish infant sample. Mothers were able to complete this instrument at home and return it by mail.

Mothers in the US sample were between 20 to 41 years of age. These participants represented a broad spectrum of socio-economic circumstances, with the majority of parents working outside the home (mostly in professional and service occupations). The American infant sample reflects the relative racial homogeneity of the Eugene-Springfield area, with primarily Caucasian mothers responding to the temperament questionnaire.

Children. Two hundred and twenty four (103 females) parents of 5-year-old children participating in a longitudinal study beginning at 18 months completed the CBQ. The data was obtained from parents of 5- and 6-year-old children who had participated in longitudinal studies conducted at the Oregon Social Learning Center (OSLC; see Fagot & Leve, 1998; Fisher, 1993). When their children were toddlers, families were recruited through local newspapers in Eugene-Springfield, OR, and compensation was provided. The sample was 95% Caucasian, which is representative of the Eugene-Springfield area. When their children were five, the majority of both mothers and fathers were employed, with a median income of \$20,000, and a median educational level of some college experience, without degree conference. At age five, 62% of children were living in two-parent homes.

Adults. English speaking parents ($N = 221$, 143 females) of 4-month-old infants from Eastern Washington and Northwestern Idaho were recruited through birth announcements released by hospitals and published in a local newspaper, and through an announcement provided with developmental information to all parents of newborn infants in local hospitals. Potential participants indicating an interest in a study addressing temperament development were contacted by project staff. None of the potential participants recruited through information given through hospitals declined participation, whereas seven families contacted based on published birth announcements decided not to take part in this research. Mothers were mailed questionnaire packets containing the ATQ, along with several other questionnaires not pertinent to the present study, when their infants were approximately 3.5 months of age, and returned completed packets by mail. Mothers participating in this study were between 20 and 42 years of age ($Mean = 28.67$; $SD = 5.27$) and fathers' ages ranged from 20 to 67 ($Mean = 30.38$; $SD = 5.27$). Of both fathers and mothers, 92% were Caucasian and 93% were married. Median family incomes fell in the range of \$30,000–\$50,000, and most mothers and fathers had completed four years of college.

Measures

Infant Behavior Questionnaire (IBQ; Rothbart, 1981). The IBQ was developed by Rothbart (1981) in order to assess individual temperamental differences in infants as defined by Rothbart and Derryberry (1981). The questionnaire is designed to refer to specific behaviors of infants during the previous week (or previous two weeks for some items). The 94-item parent-report instrument assesses six scales: Activity Level, Distress to Limitations, Duration of Orienting, Fear, Smiling and Laughter, and Soothability. In the datasets from which the current samples were taken, alphas ranged from 0.67 to 0.84 for American infants, and from 0.74 to 0.93 for Finnish infants. Items were measured using a seven-point Likert scale with response options as follows: 1 = never, 2 = very rarely, 3 = less than half the time, 4 = about half the time, 5 = more than half the time, 6 = almost always, 7 = always. A non-applicable response option was also available. Scale scores were calculated as the mean of all applicable items.

Child Behavior Questionnaire (CBQ; Rothbart *et al.*, 2001). The CBQ was derived from adaptations of the Physiological Reactions Questionnaire (PRQ; Derryberry & Rothbart, 1988) and the IBQ (Rothbart, 1981), as well as information gathered from parental interviews. The CBQ uses 195 items to analyze 15 behavioral dimensions on three factors: Surgency, which includes Activity Level, Approach, High Intensity Pleasure, Impulsivity, Shyness (reverse scored), and Smiling/Laughter; Negative Affect, which includes Frustration, Discomfort, Soothability (reverse scored), Fear, and Sadness; Effortful Control, which includes Inhibitory Control, Attentional Focusing, Low Intensity Pleasure, and Perceptual Sensitivity. In analyses of a multi-site dataset that included data used in the current paper, Rothbart *et al.* (2001) reported alphas for 4- and 5-year-olds ranging from 0.64 to 0.92. In the Finnish dataset gathered for the current study, alphas ranged from 0.65 to 0.90. A seven-point Likert scale was used ranging from 1 = extremely untrue of your child to 7 = extremely true of your child. A non-applicable response option was also available. Scale scores were calculated as the mean of all applicable items.

Adult Temperament Questionnaire (Short Form) (ATQ; Evans & Rothbart, 2007). The ATQ (Short Form) is a 77-item self-report measure analyzing motivation-emotional and attentional constructs through highly differentiated and specific temperamental scales. A four-factor model emerges from the ATQ, including Negative Affect (Fear, Sadness, Discomfort, Frustration), Extraversion/Surgency (Sociability, Positive Affect, High Intensity Pleasure), Effortful Control (Attentional Control, Inhibitory Control, Activation Control), and Orienting Sensitivity (Neutral Perceptual Sensitivity, Affective Perceptual Sensitivity, Associative Sensitivity). In the datasets from which the current samples were taken, alphas ranged from 0.55 to 0.78 for Americans and from 0.62 to 0.82 for Finnish adults. Response scaling consisted of a seven-point Likert scale, ranging from 1 = extremely untrue of you to 7 = extremely true of you. A non-applicable response option was also available. Scale scores were calculated as the mean of all applicable items.

RESULTS

Two (culture) by two (gender) ANOVA were conducted on each of the 6 IBQ scales, 15 CBQ scales, and 16 ATQ scales. Table 1 contains culture-specific means and standard deviations, and statistics for cultural effects.

Infant Behavior Questionnaire

Regarding culture effects, Finnish infants scored significantly higher than American infants on measures of Smiling and Laughter and Duration of Orienting, and American infants scored significantly higher on Fear. The effect sizes associated with these

Table 1. Differential cultural means on the IBQ, CBQ, and ATQ

Measure	Scale	Finland		United States		F	Eta ²
		M	SD	M	SD		
IBQ	Activity level	4.460	0.090	4.547	0.121	0.336	0.003
	Distress to limits	2.974	0.088	3.196	0.119	2.250	0.017
	Duration of orienting	3.956	0.131	3.335	0.177	7.979**	0.059
	Fear	2.172	0.076	2.677	0.103	15.486**	0.109
	Smiling and laughter	5.406	0.086	4.692	0.116	24.311**	0.161
	Soothability	5.178	0.105	4.830	0.141	3.906#	0.030
CBQ	Activity level	4.736	0.038	4.879	0.053	4.748*	0.007
	Approach	5.269	0.031	5.179	0.043	2.905	0.004
	Attentional control	4.622	0.032	4.889	0.044	24.114**	0.036
	Discomfort	3.709	0.045	4.258	0.062	51.868**	0.074
	Fear	3.665	0.048	3.956	0.067	12.539**	0.019
	Frustration	3.980	0.044	4.471	0.060	43.629**	0.063
	High intensity pleasure	5.040	0.044	5.045	0.060	0.005	0.022
	Impulsivity	4.365	0.041	4.526	0.057	5.341*	0.008
	Inhibitory control	4.968	0.041	5.027	0.056	0.723	0.001
	Low intensity pleasure	5.661	0.028	5.798	0.039	8.010**	0.012
	Perceptual sensitivity	5.265	0.035	5.051	0.049	12.809**	0.019
	Sadness	3.579	0.038	4.222	0.053	96.278**	0.130
	Shyness	3.238	0.056	3.386	0.078	2.401	0.004
	Smiling and laughter	5.797	0.030	5.801	0.041	0.006	0.000
	Soothability	4.973	0.035	4.605	0.049	36.858**	0.054
ATQ	Activation control	4.930	0.036	4.955	0.058	0.132	0.000
	Affective per. sensitivity	4.411	0.041	4.039	0.067	22.529**	0.029
	Associative sensitivity	4.780	0.042	4.619	0.067	4.187*	0.006
	Attentional control	4.881	0.042	4.628	0.067	10.168**	0.013
	Discomfort	3.954	0.048	3.943	0.077	0.015	0.000
	Fear	3.175	0.038	3.397	0.062	9.273**	0.012
	Frustration	3.284	0.042	3.692	0.068	26.228**	0.034
	High intensity pleasure	3.756	0.042	4.107	0.068	19.176**	0.025
	Inhibitory control	4.908	0.035	4.234	0.057	100.998**	0.118
	Neutral per. sensitivity	4.709	0.042	4.880	0.068	4.614*	0.006
	Positive affect	5.114	0.038	4.757	0.061	24.347**	0.031
	Sadness	3.967	0.038	4.013	0.061	0.407	0.001
	Sociability	4.986	0.047	4.846	0.075	2.494	0.003

Note: Bold numerals indicate, for significant cultural effects, the country with higher scores. Df for IBQ comparisons = 1, 127; df for CBQ comparisons = 1, 647; df for ATQ comparisons = 1, 756.

$p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

differences range from medium, for Duration of Orienting, to large, for Smiling and Laughter (Cohen, 1988). A small, marginally significant difference was found on the Soothability scale, with Finnish infants outscoring American infants on this trait.

Significant mean differences were also found between genders for Fear, with girls scoring higher on this measure, $F(1,127) = 6.31$, $p < 0.05$. No significant differences were found for sex or culture for Activity Level or Distress to Limitations, nor were there any significant interactions between sex and culture for any scale.

Child Behavior Questionnaire

American children scored higher than Finnish children on Activity Level, Frustration, Attentional Control, Discomfort, Fear, Impulsivity, Low Intensity Pleasure, and Sadness. Finns scored higher on Falling Reacting/Soothability and Perceptual Sensitivity. The majority of effect sizes were small, with moderate effects for Discomfort, Frustration and Sadness.

Gender differences were found for several scales of the CBQ. Girls outscored boys on Attentional Control, Discomfort, Fear, Inhibitory Control, Low Intensity Pleasure, Perceptual Sensitivity, and Sadness, $F_s(1,647) = 16.72, 23.29, 8.45, 17.30, 21.26, 45.41$, and 14.78 , respectively, all $p_s < 0.001$. Boys scored higher than girls on Activity Level and High Intensity Pleasure, $F_s(1,647) = 21.18$ and 14.23 , respectively, $p_s < 0.001$.

Two significant interaction effects between gender and culture were found on the Child Behavior Questionnaire; these interactions concerned the Discomfort scale, $F(1,647) = 6.86$, $p < 0.01$, and the Fear scale, $F(1,647) = 4.10$, $p < 0.05$. *Post-hoc* analyses of simple main effects, utilizing a Bonferroni correction, indicated that American females scored significantly higher than their male counterparts on both Discomfort and Fear, $F_s(1,647) = 21.08$ and 9.24 , $p_s < 0.001$ and 0.01 , respectively. Finnish females only scored marginally higher than Finnish males on Discomfort $F(1, 647) = 3.55$, $p = 0.06$, and no gender differences emerged in the Finnish sample with regard to Fear $F(1,647) = 0.57$, $p = 0.45$ (see Fig. 1).

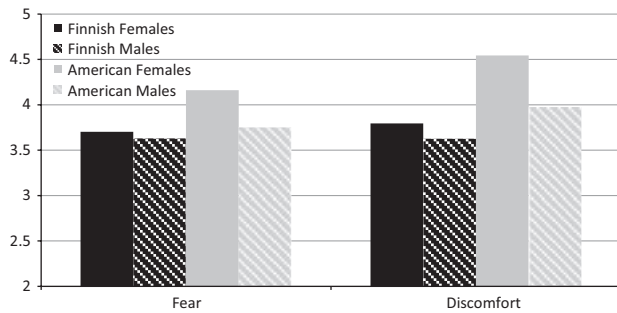


Fig. 1. Means for American and Finnish females and males for temperament dimensions that yielded significant interactive effects on the Child Behavior Questionnaire.

Adult Temperament Questionnaire

Americans reported higher levels of Fear, Frustration, High Intensity Pleasure, and Neutral Perceptual Sensitivity, whereas Finns scored higher on Attentional Control, Inhibitory Control, Positive Affect, Affective Sensitivity, and Associative Sensitivity. The effect for Inhibitory Control was moderate, whereas all other effect sizes were small.

Females scored higher on Fear, Sadness, Discomfort, Sociability, Positive Affect, Neutral Perceptual Sensitivity, and Affective Sensitivity, $F(1,756) = 129.90, 156.61, 46.69, 35.27, 32.79, 11.55,$ and $23.14,$ respectively, all $ps < 0.001,$ whereas males scored higher on High Intensity Pleasure, $F(1,756) = 53.14,$ $p < 0.001.$

Interaction effects were found for Frustration, Sadness, Discomfort, Attentional Control, Inhibitory Control, Neutral Perceptual Sensitivity, and Associative Sensitivity, $F_s(1,755) = 8.11, 5.58, 8.12, 5.67, 5.14, 7.50$ and $9.33,$ $ps < 0.01, 0.05, 0.05, 0.05, 0.05, 0.01$ and $0.01,$ respectively. See Fig. 2 for mean scores for men and women from Finland and the US.

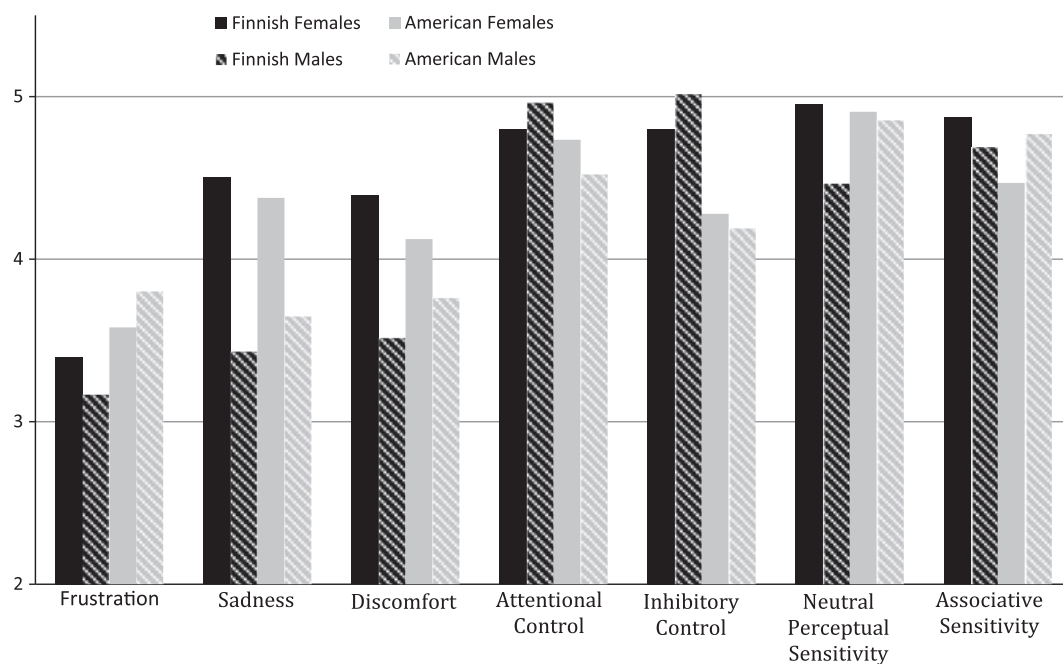


Fig. 2. Means for American and Finnish females and males for temperament dimensions that yielded significant interactive effects on the Adult Temperament Questionnaire.

Contrary to expectations, gender differences appeared to be somewhat more pronounced in the Finnish sample. Although women scored significantly higher than their male counterparts in Sadness, $F_s(1, 755) = 199.69$ and 35.64 in Finland and US, respectively, $ps < 0.01,$ and Discomfort, $F_s(1, 755) = 84.58$ and $5.49,$ $ps < 0.01$ and $< 0.05,$ these differences were greater among Finns. Women in both cultures also scored higher in Neutral Perceptual Sensitivity, but this effect was very small in the US and only significant in Finland, $F(1, 755) = 33.99,$ $p < 0.01.$

More surprising were interactions in which gender effects differed by country. For Associative Sensitivity, $F(1, 755) = 4.78,$ $p < 0.05,$ and Frustration, $F(1, 755) = 7.57,$ $p < 0.01,$ Finnish females scored significantly higher than Finnish males, whereas American males were significantly higher than American females for Associative Sensitivity, $F(1, 755) = 5.02,$ $p < 0.05,$ and marginally so for Frustration, $F(1, 755) = 2.72,$ $p = 0.10.$ For Inhibitory Control, $F(1, 755) = 9.23,$ $p < 0.01$ and Attentional Control, $F(1, 755) = 3.93,$ $p < 0.05,$ Finnish males scored significantly higher than Finnish females, but these sex differences were non-significant and in the opposite direction in the American sample.

DISCUSSION

This study addressed differences in temperament between Americans and Finns across infancy, childhood, and adulthood. Overall, Americans reported higher levels of Negative Affect across all three age groups. Additionally, as expected, Americans reported more tendencies toward behavioral aspects of Surgency whereas Finns expressed higher levels of positive affectivity and more Effortful Control. However, these results were not consistent across all three ages, suggesting the influence of age-dependent contextual factors, as explored below. Analyses of interaction

effects revealed some findings regarding gender differences between countries that were contrary to our expectations. Whereas we predicted that gender differences would be more pronounced in the American sample, gender discrepancies were actually more prominent between Finnish adult males and females for some dimensions of negative affect.

Cultural differences

In all three age groups, Americans scored higher on many aspects of negative affect than Finns. In childhood, Americans outscored the Finnish sample on all dimensions of negative affect. This level of consistency may be due to genetic differences. This explanation, however, is problematic, given findings of greater levels of fearfulness in blue-eyed than brown-eyed Caucasian US children, which have been speculatively linked to differing evolutionary pressures in northern and southern Europe favoring fearfulness in Scandinavian populations (Kagan, 1994). Additionally, a close comparison of effect sizes does indicate change over time with regard to negative affect. For example, whereas the effect size for fear is quite large in infancy and cross-cultural differences on that dimension remain across all ages, effect sizes indicate that other aspects of negative affect become more exaggerated than fear throughout childhood and adulthood.

Differences between Finnish and American individuals with regard to negative affect may instead be explained through the effects of harsh parenting on systems underlying behavioral inhibition. As compared to Finns, American children are exposed to harsher parenting and are more likely to receive punishment (Hofstede, 1991), which, in a previous cross-cultural analysis, Ahadi, Rothbart and Ye (1993) suggested could determine differences in mean traits in levels of anxiety and negative affect. Furthermore, Shamai (2001) found that parents experiencing greater levels of stress report more negative emotional experiences for both themselves and their children. Parents in the United States, who receive relatively little childcare support from their government, are mandated to return to work earlier than Finnish parents (Ministry of Social Affairs and Health, 2006), and must frequently leave young children with non-familial caretakers, may experience higher stress levels. These factors may have both direct and indirect effects on the fearfulness and negative affect of their infants and children, as well as on themselves. Additionally, the possibility for greater numbers of Finnish mothers to stay at home with their newborns may account for higher levels of Soothability in Finnish infants and children, as compared to Americans. Soothability, above other temperament scales, may reflect aspects of the mother-child relationship (Gartstein & Rothbart, 2003), and Finnish mothers have enhanced opportunities to learn how to soothe their child, while the infant may develop more consistent expectations regarding when and how they will be soothed.

We can find conceptual differences between the aspects of Surgency for which Americans and Finns scored higher. Whereas Americans tended to score higher on more behavioral aspects of Surgency such as Activity Level and High Intensity Pleasure, Finns scored higher on more affective aspects, such as Positive Affect and Smiling and Laughter. This is consistent with our prediction that people in more Individualistic cultures, as determined by Hofstede (2001), will score higher on measures of Exuberance

and Activity Level, due to cultural values placing emphasis on enthusiasm and assertiveness in the United States (Wang, 2001). Similarly, we predicted that Finns would score higher on Positive Affect, since they are raised to be pleasure-seeking (Tulviste & Ahtonen, 2007).

However, Finns did not score higher than Americans on the affective aspects of Surgency in childhood. Infants and adults, but not children, were higher in Positive Affect than their US counterparts, and effect sizes indicated more profound differences with regard to temperamental Surgency in infancy and adulthood than childhood. This finding may reflect contextual factors occurring during childhood, particularly the age at which children enter school. American children start compulsory education at age 5, whereas Finnish children do not begin until they are 7 years old. Through interactions with peers and teachers, American schoolchildren would also be learning how to cultivate the sharing of positive emotions, leading to greater expression of Positive Affect which brings them temporarily to the level of their Finnish peers.

School may have a similar impact on characteristics of Effortful Control, as our results regarding elements of this dimension differed across the ages. Specifically, whereas Finnish infants and adults demonstrated greater attentional focus than US infants and adults, this finding was reversed during childhood. Because of the differential age at which children begin compulsory education, the Americans had already spent time in structured interactions in which they were expected to control their attentional processes in an effortful manner at age six, when our CBQ subjects were studied. After Finns begin attending school, cultural norms regarding Uncertainty Avoidance and socialization pressures regarding patience and reservation may lead to the development of greater Effortful Control, revealed in our adult findings.

Gender differences

Several gender differences obtained in this study were found in multiple age groups and are consistent with previous findings (see Bezirgianian & Cohen, 2002; Brody, Lovas & Hay, 1995; Else-Quest, Hyde, Goldsmith & Van Hulle, 2006; Gartstein & Rothbart, 2003). In general, females tended to be rated higher on negative affectivity, and lower on enjoyment of highly intense activities, than males. The consistency of differences in fearfulness and stimulation seeking from infancy through adulthood may indicate support for sex-linked genetic differences in these domains of temperament (Marks, 1969; Seward & Seward, 1980). Tendencies toward other withdrawal-based negative emotions are also consistent with higher rates of depression and other anxiety disorders in females in multiple countries (Kessler, Berglund, Demler *et al.*, 2003).

Curiously, gender differences in Activity Level and aspects of Effortful Control were limited to childhood. These differences may be related to faster maturation rates in females (Campbell *et al.*, 2005; Epstein, 1978; Silberman & Snarey, 1993; Tanner, Whitehouse, Marubini & Resele, 1976), which allow girls greater facility in conforming to societal expectations for conduct consistent with adults' expectations, before boys "catch up" about two years later. Another possibility is that societal expectations for girls to conform to subordinate and dependent positions

are more pronounced in childhood, but might diminish after adolescence (Reid & Paludi, 1993).

Interaction effects

Interaction effects revealed intriguing findings. Consistent with impressions of more egalitarian views regarding gender in Nordic cultures (Hofstede, 1991; Kalin & Tilby, 1978), gender differences in aspects of negativity were more pronounced in American children. Surprisingly, though, these same differences were accentuated among Finnish adults. American children could have been receiving socialization messages concerning gendered acceptability of expression of fear and discomfort through experiences in formal schooling that their Finnish agemates had not yet begun to receive. In contrast, enhanced attention to gender in American culture may have led adults from the US to downplay their gender-typical behavior, whereas in Finland, the decreased salience of gender led to less biased reports of displays of negative affect, as suggested by Schmitt, Realo, Voracek, and Allik (2008).

Also surprising were instances of differing gender patterns between the two cultures, such that American adult males scored higher than their female counterparts on Frustration and Associative Sensitivity, whereas Finnish males scored lower than Finnish females on these dimensions. Additionally, where Finnish males scored higher than Finnish females on Attentional and Inhibitory Control, and lower than females on Neutral Perceptual Sensitivity, limited or no gender differences were found for these dimensions in the US samples. Such differences may speak to disparities in cultural perceptions regarding gender roles in the two countries. Increased opportunities in Finland for fathers to take parental leave (Lammi-Taskula, 2008; Ministry of Social Affairs and Health, 2006) may promote constraint in Finnish males, whereas American men may receive cultural support for the expression of Frustration through the gender roles they are exposed to in a more polarized country.

Limitations and future studies

In addition to providing the first fine-grained analyses of cross-cultural differences in temperament between Finnish and American citizens, the current study represents a contribution to the broader literature regarding cross-cultural differences through the use of samples representing multiple life stages. This promise, however, is tempered by limitations to our project. Our data is completely reliant on parent- or self-reported measures, with no complementary observational data. Schmitt and his colleagues (Schmitt, Allik, McCrae & Benet-Martinez, 2007; Schmitt *et al.*, 2008) have raised concerns regarding the use of questionnaires in cross-cultural studies, because differences might be attributable to external factors, such as social comparison processes, inappropriate translations, or non-identical response styles of people from different cultures, as opposed to true behavioral differences. This critique may be alleviated by research that has shown that parental reports have superior predictive validity, relative to other measures of temperament (Pauli-Pott, Mertesacker & Beckmann, 2004), but future efforts would benefit through the use of other forms of data. Additionally, similar studies using different temper-

ament and personality instruments may be able to provide a more comprehensive understanding of the nature of these cross-cultural differences, especially in trying to gain a sense of the integrated impacts of both individual and environmental influences (Rothbart *et al.*, 2000).

A second shortcoming concerns the comparability of the US and Finnish samples, which were not recruited specifically to match each other. The conception for the analysis came after the data was collected and, therefore, sampling selection procedures were not completely consistent across cultures. As such, replication with samples more carefully identified for comparability will be valuable.

Despite these limitations, as a first analysis using the IBQ, CBQ and ATQ to directly compare temperamental differences between the United States and Finland, our study provides impetus for future comparisons between these and other countries. The reasoning that we provide for the above results are merely speculative, so future research should measure the true social correlates of cross-cultural temperamental differences. Future analyses of aspects of the "developmental niche," including parenting behaviors, child-rearing practices, socialization pressures, and cultural priorities across a variety of countries, will lead to greater understanding of the origins of cultural variability in temperament.

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