

## Developmental Aspects of Self-Regulation in Germany and Chile: Links among Maternal Warmth, Children's Self-Regulation, and Social Competence

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### Abstract

The present study investigated relations among maternal warmth, children's self-regulation (i.e., behavior and emotion regulation), and prosocial behavior. The assumed relations were studied in Germany and Chile, two socialization contexts differing in socio-economic and cultural factors. The sample consisted of 76 German and 167 Chilean fourth graders, their mothers, and teachers. Maternal warmth was rated by mothers with the Parenting Practice Questionnaire (PPQ). Children reported the use of emotion regulation strategies on the Questionnaire for the Measurement of Stress and Coping in Children and Adolescents (SSKJ 3-8). Mothers' and teachers' ratings on the Strengths and Difficulties Questionnaire (SDQ) were used to measure children's behavior regulation and prosocial behavior. Regression analyses revealed positive relations of maternal warmth to children's problem-oriented emotion regulation and of behavior regulation to prosocial behavior in Germany and in Chile. Moreover, mediation analyses revealed indirect positive effects of self-regulation on the relations between maternal warmth and prosocial behavior. These indirect effects occurred for different aspects of self-regulation in Germany (i.e., behavior regulation) and in Chile (i.e., problem-oriented emotion regulation). Results are discussed from a cultural informed developmental perspective.

### Introduction

“Self-regulation” is understood as the ability and motivation to regulate behavior and emotions in order to achieve individual and social goals successfully (Trommsdorff, 2009). Previous research has underlined the function of self-regulation for positive social, emotional, and cognitive development in European and Northern American contexts. However, the development of self-regulation and its relation to prosocial behavior has been rarely studied in other cultural contexts (Trommsdorff, 2012). This study aims to investigate associations between maternal warmth, children's self-regulation, and prosocial behavior in diverse cultural contexts (i.e., Germany, Chile). We focused on behavior and emotion regulation as distinguishable but interrelated aspects of self-regulation. While behavior regulation is defined as the ability to inhibit impulsive behavior in order to comply with social demands (Calkins, 2007), emotion regulation comprises

processes that aim to regulate emotions (Gross & Thompson, 2007).

Self-regulation is important to achieve individual and social goals (e.g., prosocial behavior). Thus, children with the intention to benefit another person, but with low skills to regulate themselves accordingly, are less likely to act prosocially. Behavior and emotion regulation can facilitate prosocial behavior in various ways. Whereas behavior regulation allows to delay a personal need in favor of a prosocial deed, emotion regulation promotes other-oriented empathic responses that motivate prosocial behavior (Heikamp, Trommsdorff, & Fäsche, 2013; Trommsdorff, 2005).

Past research suggested relations of parental warmth to children's self-regulation and prosocial behavior. Warm parenting behavior creates contexts of mutual reciprocity that promote children's sensitivity for others' needs and prosocial behavior. These contexts not only provide learning opportunities (e.g., role modeling) for social competences but also foster the general motivation to engage in positive social interactions with others (Davidov & Grusec, 2006). This is also in line with the finding, that in warm parent-child-interactions children are more motivated to regulate themselves to meet maternal standards and values because they aim to maintain the positive experience of reciprocal interaction; in turn they are more likely to be rewarded (e.g., praise) for behaving in a self-regulated manner (MacDonald, 1992). In summary, past findings suggest that warm parenting fosters not only the motivation for prosocial behavior but also promotes the development of the ability to regulate behavior accordingly. A recent longitudinal study by Eisenberg, VanSchyndel, and Hofer (2014) showed that maternal warmth during childhood was positively related to social behavior in early adulthood. Thus, maternal warmth during childhood seems to play an important role for children's social competence even in further life-span development.

Accordingly, on the one hand positive relations between self-regulation and prosocial behavior were expected (hypothesis 1). On the other hand, it was proposed that maternal warmth is associated positively with both children's self-regulation (hypothesis 2) and prosocial behavior (hypothesis 3). Thus, it was expected, that self-regulation mediates the relation between maternal warmth and prosocial behavior (hypothesis 4). In order to gain insights about the developmental conditions of self-regulation and prosocial behavior in diverse cultures, the assumed relations were studied in Germany and Chile.

As parenting behavior is part of a cultural niche which is influenced by culturally shared beliefs and impacts the individual development of the child (Super & Harkness, 1997), we investigated whether German and Chilean mothers differ in their maternal warmth (research question 1). Furthermore, we assumed that the development of self-regulation and prosocial behavior both are influenced by cultural values and cultural specific parenting practices. That is why we were interested whether German and Chilean children differ in self-regulation (research question 2) and in prosocial behavior (research question 3). Finally, we explored whether there are cultural differences in the



relations between maternal warmth, children's self-regulation, and prosocial behavior (research question 4).

## Method

### Participants

The sample consisted of 76 German (31 boys, 45 girls) and 167 Chilean (56 boys, 111 girls) fourth graders, their mothers, and their class teachers. Children's mean age was 10.21 years ( $SD = 0.44$ ) in the German sample and 10.16 years ( $SD = 0.42$ ) in the Chilean sample. The sample was recruited from four primary schools in Germany and four primary schools (two public, two private) in Chile. The Chilean Sample was recruited in public and private schools to represent socio-economic differences of the Chilean educational system. Mothers and class teachers were asked to complete questionnaires.

### Measures

Class teachers and mothers evaluated children's behavior regulation with the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) by answering five items on a 3-point scale (1 = not true to 3 = certainly true). One item was for example: "The child thinks things out before acting". Reliability analyses revealed satisfying results for mothers' evaluations (Cronbach's  $\alpha$  (Germany) = .83; Cronbach's  $\alpha$  (Chile) = .81) and for teachers' evaluations (Cronbach's  $\alpha$  (Germany) = .76; Cronbach's  $\alpha$  (Chile) = .90). Mothers' and teachers' evaluations of children's behavior regulation were averaged into a behavior regulation score in each sample to increase the validity of the measure.

Emotion regulation was assessed by the Questionnaire for the Measurement of Stress and Coping in Children and Adolescents (SSKJ 3-8; Lohaus, Eschenbeck, Kohlmann, & Klein-Heßling, 2006). Children were asked to imagine being in a stressful social situation (i.e., having an argument with a friend). Then they answered on a scale from 1 (= never) to 5 (= always) how often they use problem-oriented emotion regulation strategies (six items; e.g., "I try to think of different ways to solve it"). Reliability analyses revealed satisfying results (Cronbach's  $\alpha$  (Germany) = .85; Cronbach's  $\alpha$  (Chile) = .84).

Class teachers rated children's prosocial behavior using the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997). One item was for example "The child often volunteers to help others". Teachers answered five items on a scale from 1 = (not true) to 3 = (certainly true). Reliability analyses revealed a Cronbach's  $\alpha$  of .76 in the German sample and a Cronbach's  $\alpha$  of .77 in the Chilean sample.

Maternal warmth was rated by mothers with the Parenting Practice Questionnaire (PPQ; Robinson, Mandleco, Olsen, & Hart, 1995). Mothers answered 11 items, indicating from 1 (= never) to 5 (= always), how often they show certain behaviors when interacting with their children. For example one item was "I express affection by hugging, kissing, and holding my child". Reliability analyses revealed a Cronbach's  $\alpha$  of .78 and

.76 in the German and Chilean sample respectively.

We tested construct equivalence of instruments across the two cultural groups (i.e., Germany, Chile) by employing target rotations (He & van de Vijver, 2012). Tucker's phi coefficients were computed to test to what extent factors are congruent across cultures. Tucker's phi coefficients were above .95 for all measures and therewith met the criteria of construct equivalence across cultures (van de Vijver & Leung, 1997). To test cultural mean differences, analyses of covariance (ANCOVAs) were computed. As tests of cultural mean differences require scalar equivalence (He & van de Vijver, 2012), we standardized scores with the ipsatization procedure to avoid cross-cultural differences due to response bias<sup>1</sup> (Fischer, 2004; van de Vijver & Leung, 1997). As ipsatized scores have properties which can distort statistical techniques involving correlations (Fischer, 2004), the ipsatized values were used for the ANCOVAs only. Relations between variables were tested with unstandardized original values by using the bootstrapping method INDIRECT (Preacher & Hayes, 2008).

## Results

To test cultural mean differences in maternal warmth, self-regulation (i.e., behavior and emotion regulation), and prosocial behavior, analyses of covariance (ANCOVAs) with ipsatized values as well as with unstandardized original values were computed. All ANCOVAs included age as covariate and gender as predictor variable. Means, standard deviations, and cultural mean differences are presented in Table 1. ANOCOVAs with ipsatized values revealed that German mothers reported to use significantly more often maternal warmth than Chilean mothers. According to teachers' and mothers' reports, German in comparison to Chilean children's behavior regulation was significantly higher. German children reported to use problem-oriented strategies more often than Chilean children. Teachers' ratings revealed that German children show more prosocial behavior in the school context than Chilean children. Results of ANOCOVAs with unstandardized original values were consistent with the results of ANCOVAs with ipsatized values for maternal warmth and children's behavior regulation. ANOCOVAs with unstandardized original values showed no cultural mean differences for children's problem-oriented strategies and prosocial behavior.

<sup>1</sup>ANCOVAs with ipsatized values as well as ANOCOVAs with unstandardized original values were conducted. Absence of acquiescence bias is ensured when results of ANCOVAs with ipsatized values and unstandardized values are consistent. When results of ipsatized values and unstandardized values differ, there might exist an acquiescence bias.



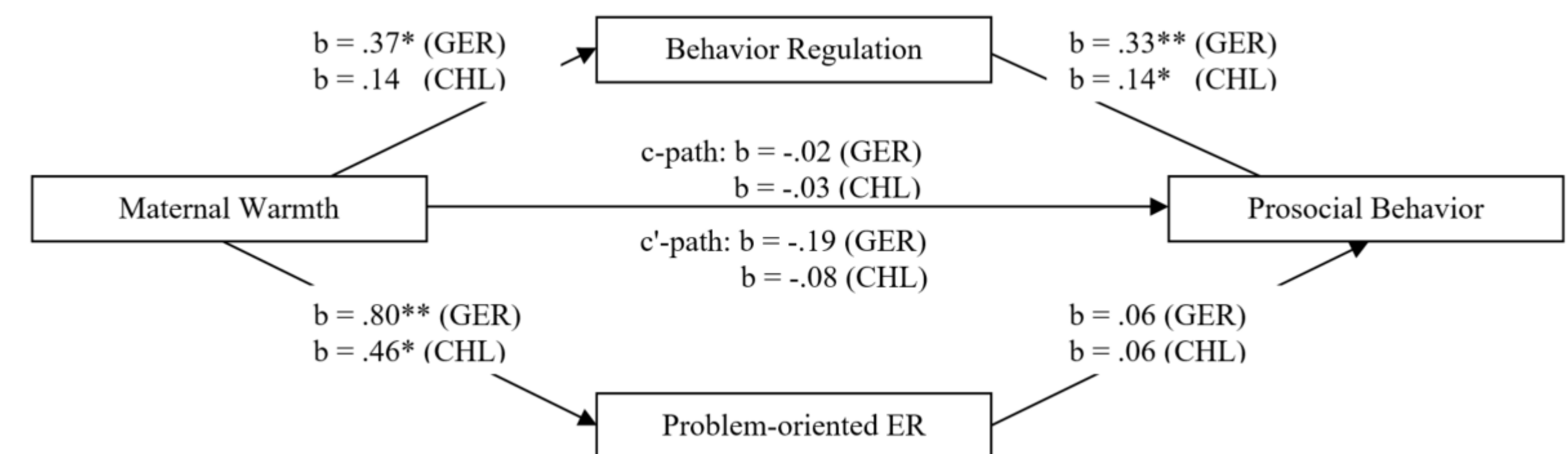
**Table 1**  
Means, standard deviations, and cultural mean differences

Variable	Germany		Chile		<i>F</i> (1,237)	$\eta^2$
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Maternal warmth	3.41 (4.68)	.17 (.33)	3.24 (4.53)	.26 (.42)	24.47** (7.08**)	.09 (.03)
Behavior regulation (M)	1.84 (2.43)	.43 (.48)	1.61 (2.17)	.50 (.55)	15.08** (14.25**)	.06 (.06)
Behavior regulation (T)	3.64 (2.70)	.90 (.41)	2.69 (2.23)	1.10 (.61)	48.28** (38.50**)	.17 (.14)
Problem-oriented ER	2.73 (3.55)	.55 (.80)	2.52 (3.69)	.56 (1.01)	7.03** (1.10)	.03 (.01)
Prosocial behavior (T)	3.45 (2.61)	.52 (.40)	3.21 (2.66)	.59 (.40)	9.20** (1.31)	.04 (.01)

*Note.* Ipsatized values; for reasons of clarity, a constant of 2.00 was added to all ipsatized values. Unstandardized original values are given in parentheses. *N* = 243, *N* (Germany) = 76, *N* (Chile) = 167; (M) = mothers' evaluations; (T) = teachers' evaluations; ER = emotion regulation; \**p* < .05; \*\**p* < .01.

To test relations between maternal warmth, children's self-regulation, and prosocial behavior, mediation models were tested by using the bootstrapping method INDIRECT (Preacher & Hayes, 2008). Indirect effects, based on 95% confidence intervals (CI) derived from 5000 bootstrap samples, are significant when the CI values do not include zero. Gender and age were included as control variables. The mediation model was tested for the German and the Chilean sample separately. Results of the mediation models are presented in Figure 1.

Analyses revealed positive relations between behavior regulation and prosocial behavior in the German and in the Chilean sample. Problem-oriented emotion regulation was not significantly related to prosocial behavior, neither in the German nor in the Chilean sample. In Germany, but not in Chile, maternal warmth was positively related to behavior regulation. In both samples, we found positive relations between maternal warmth and problem-oriented emotion regulation. Although there were no significant direct effects of maternal warmth on prosocial behavior, analyses revealed indirect effects of maternal warmth on prosocial behavior in Germany and in Chile. In the German sample, a significant indirect and positive effect of behavior regulation on the relation between maternal warmth and prosocial behavior occurred (indirect effect = .12, *SE* = .08, 95% CI [.011 .340]). In the Chilean sample, we found a significant indirect and positive effect of problem-oriented emotion regulation on the relation between maternal warmth and prosocial behavior (indirect effect = .03, *SE* = .02, 95% CI [.001 .091]).



**Figure 1**

Multiple mediation test of the relation between maternal warmth and prosocial behavior mediated by behavior regulation and problem-oriented emotion regulation. Models were tested separately for the German and the Chilean samples.

*N* (Germany) = 76; *N* (Chile) = 167; *b* = unstandardized regression coefficient, controlled for age and gender; GER = German sample, CHL = Chilean sample; ER = emotion regulation; \**p* < .05; \*\**p* < .01.

Furthermore, to test whether relations between maternal warmth, self-regulation, and prosocial behavior were moderated by culture, we used PROCESS bootstrapping method (Hayes, 2013). The moderated mediation model was conducted with culture (i.e., Germany, Chile) as moderator variable. Gender and age were included as control variables. The analyses showed that culture does not moderate any of the direct and indirect effects of the model (see Table 2).

**Table 2**

Interaction effects of moderated mediation models with culture as moderator variable

	Outcome Variable	<i>b</i>	95% CI
Maternal Warmth × culture interaction	Prosocial Behavior	-.10	-.42, .23
	Behavior regulation	.20	-.17, .56
	Problem-oriented ER	.23	-.51, .97
Behavior regulation × culture interaction	Prosocial Behavior	.22	-.04, .48
Problem-oriented ER × culture interaction	Prosocial Behavior	.01	-.12, .13

*Note.* *N* = 243, *N* (Germany) = 76; *N* (Chile) = 167; ER = emotion regulation; *b* = unstandardized regression coefficient, controlled for age and gender.

## Discussion

As hypothesized, behavior regulation was positively related to prosocial behavior in Germany and in Chile. This result underlines the important role of behavior regulation



for social competences.

Maternal warmth and problem-oriented emotion regulation were positively related in both samples, while maternal warmth and behavior regulation were positively related only in the German sample. Therefore, results for the German sample are in line with previous findings regarding maternal warmth and the development of self-regulation (e.g., MacDonald, 1992). For the Chilean sample, maternal warmth appears to be related primarily to emotion-related aspects of self-regulation. It should be considered that relations between maternal warmth and self-regulation could be bidirectional (e.g., Kochanska & Aksan, 1995). That is, children's self-regulation could also influence maternal warmth. Future research based on longitudinal designs is needed to investigate the directions of the relations between maternal warmth and self-regulation.

Contrary to our hypotheses, we found no direct relations between maternal warmth and prosocial behavior. Nonetheless, indirect positive effects via self-regulation occurred. This result is in line with Eisenberg, Fabes, and Spinrad's (2006) notion that the relation between maternal warmth and children's prosocial behavior sometimes is only discovered through mediation. The results of the present study indicated that maternal warmth has an indirect effect on prosocial behavior mediated by self-regulation. Further, depending on the cultural context, only specific aspects of self-regulation might mediate the relation between maternal warmth and prosocial behavior. While in the German sample behavior regulation indirectly affected the relation between maternal warmth and prosocial behavior, in the Chilean sample the relation was affected indirectly by problem-oriented emotion regulation.

Regarding cross-cultural analyses, we found cultural mean differences as well as cultural similarities. German mothers showed more maternal warmth than Chilean mothers. Behavior regulation, problem-oriented emotion regulation, and prosocial behavior were higher for German children than for Chilean children. We are aware of the difficulty to interpret cultural mean comparisons for children's problem-oriented strategies and prosocial behavior as scalar equivalence is not ensured for these scales and there might exist an acquiescence bias. Relations between maternal warmth, children's self-regulation, and prosocial behavior were partially similar and not moderated by culture.

Overall, the study underlines the theoretical relevance of approaching self-regulation as a two component concept (i.e. behavior and emotion regulation). This disaggregation of the concept allows for a more comprehensive understanding of the relations between self-regulation and other variables across cultures. Specifically, it allows the description of different pathways between maternal warmth and prosocial behavior for different cultural contexts; and highlights the importance of behavior regulation for prosocial behavior.

### Author note

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### References

- Calkins, S. D. (2007). The emergence of self-regulation: Biological and behavioral control mechanisms supporting toddler competencies. In C. A. Brownell & C. B. Kopp (Eds.), *Socioemotional development in the toddler years: Transitions and transformations* (pp. 261-284). New York, NY: Guilford Press.
- Davidov, M., & Grusec, J. E. (2006). Untangling the links of parental responsiveness to distress and warmth to child outcomes. *Child Development, 77*, 44-58.
- Eisenberg, N., Fabes, R. A., & Spinrad, T. L. (2006). Prosocial development. In N. Eisenberg, W. Damon, & R. M. Lerner (Eds.), *Handbook of child psychology: Social, emotional, and personality development* (6th ed., Vol. 3, pp. 646-718). Hoboken, NJ: Wiley.
- Eisenberg, N., VanSchyndel, S. K., & Hofer, C. (2014). The association of maternal socialization in childhood and adolescence with adult offsprings' sympathy/caring. *Developmental Psychology*. Advance online publication. doi: 10.1037/a0038137
- Fischer, R. (2004). Standardization to account for cross-cultural response bias: A classification of score adjustment procedures and review of research in JCCP. *Journal of Cross-Cultural Psychology, 35*, 263-282.
- Goodman, R. (1997). The strengths and difficulties questionnaire: A research note. *Journal of Child Psychology and Psychiatry, 38*, 581-586.
- Gross, J. J., & Thompson, R. A. (2007). Emotion regulation: Conceptual foundations. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 3-24). New York, NY: Guilford Press.
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: Guilford Press.
- He, J., & van de Vijver, F. (2012). Bias and equivalence in cross-cultural research. *Online Readings in Psychology and Culture, 2*. <http://dx.doi.org/10.9707/2307-0919.1111>
- Heikamp, T., Trommsdorff, G., & Fäsche, A. (2013). Development of self-regulation in context. In G. Seebaß, M. Schmitz, & P. M. Gollwitzer (Eds.), *Acting intentionally and its limits: Individuals, groups, institutions* (pp. 193-222). Berlin, Germany: De Gruyter.
- Kochanska, G., & Aksan, N. (1995). Mother-child mutually positive affect, the quality of child compliance to requests and prohibitions, and maternal control as correlates of early internalization. *Child Development, 66*, 236-254.
- Lohaus, A., Eschenbeck, H., Kohlmann, C., & Klein-Heßling, J. (2006). *Fragebogen zur Erhebung von Stress und Stressbewältigung im Kindes- und Jugendalter (SSKJ 3-8)* [Questionnaire for the Measurement of Stress and Coping in Children and Adolescents (SSKJ 3-8)]. Göttingen, Germany: Hogrefe.
- MacDonald, K. (1992). Warmth as a developmental construct: An evolutionary analysis. *Child Development, 63*, 753-773.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*, 879-891.
- Robinson, C. C., Mandlco, B., Olsen, S. F., & Hart, C. H. (1995). Authoritative, authoritarian, and permissive parenting practices: Development of a new measure. *Psychological Reports, 77*, 819-830.
- Super, C. M., & Harkness, S. (1997). The cultural structuring of child development. In J. Berry, & P. R. Dasen (Eds.), *Handbook of cross-cultural psychology: Basic processes and human development* (2nd ed., Vol. 2, pp.



1-39). Needham Heights, MA: Allyn & Bacon.

Trommsdorff, G. (2005). Entwicklung sozialer Motive: Pro- und antisoziales Handeln [Development of social motives: Prosocial and antisocial behavior]. In J. B. Asendorpf (Ed.), *Soziale, emotionale und Persönlichkeitsentwicklung. Enzyklopädie Serie V, Band 3* (pp. 75–139). Göttingen, Germany: Hogrefe

Trommsdorff, G. (2009). Culture and development of self-regulation. *Social and Personality Psychology Compass*, 3, 687-701.

Trommsdorff, G. (2012). Development of “agentic” regulation in cultural context: The role of self and world views. *Child Development Perspectives*, 6, 19-26.

Van de Vijver, F., & Leung, K. (1997). Methods and data analysis of comparative research. In J. W. Berry, Y. H. Poortinga, & J. Pandey (Eds.), *Handbook of cross-cultural psychology: Theory and method* (2nd ed., Vol. 1, pp. 257-300). Needham Heights, MA: Allyn & Bacon.