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Buffering and ambiguity effects of maternal warmth on associations between psychological control and child attachment in a cross-national perspective

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Although warmth and psychological control are core parenting dimensions, their combined effect on child attachment is not well recognized, yet needed to understand complex parenting processes that may lead to the development of attachment security and insecurity in childhood. Results of previous studies support two mechanisms. Firstly, the *buffering model* reveals that parental warmth mitigates the negative effects of maternal psychological control on child attachment. Secondly, the *ambiguity model* indicates that parental warmth boosts negative effects of psychological control on child attachment. Studies also suggest that the eco-cultural context of parenting may explain when and why one of these models is more adaptive than the other. Building on previous studies, it was hypothesized that the ambiguity model will be evidenced in the Netherlands and Norway, whereas the buffering model in Turkey, Belarus, and Poland. To test the hypothesis, two data sets utilizing a multi-informant, multi-measure, and multi-age approach were analyzed. It allowed us to compare reports of the current maternal parenting experience in middle childhood (Study 1) against retrospective memories of maternal parenting in adulthood (Study 2). Data were collected from 758 Dutch, Polish, and Turkish mother-child dyads in Study 1, and from 307 adults in Poland, Belarus and Norway in Study 2. Results supported the ambiguity model in middle childhood in the Polish and Turkish mother-child dyads, and in the Norwegian group of adults. The buffering model was supported in the Dutch mother-child dyads, as well as in the Belarusian and Polish samples of adult children who recalled their childhood parenting experiences following the collapse of communism in Poland and during the ongoing dictatorship in Belarus. These results extend previous studies highlighting the importance of socio-political context of parenting and cultural specificity of attachment development.

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Attachment security is the foundation for personality that fosters a sense of one's mastery, adaptive emotion regulation, and positive relationships with others (Sroufe, 2016). Attachment quality develops early in childhood within the parent-child relationship (Bowlby, 1969) and is established by two security and two insecurity-related aspects. Security refers to one's ability to view their attachment figure (e.g., a parent) as a safe haven providing sheltering protection in times of distress (e.g., by support provision) and as a secure base enabling one to explore the world when distress is absent (e.g., Ainsworth et al. 1978; Cassidy, 2016).

Attachment security is the primary attachment strategy infants learn to use in relation to their caregivers. However, when security may not be a viable option (e.g., the parenting quality does not meet the child's needs), infants may develop secondary attachment strategies marked by two facets of attachment insecurity, anxiety and avoidance (e.g., Kerns and Brumariu, 2016). Attachment anxiety is associated with worries about not being loved or accepted by the attachment figure and may manifest through behaviours such as clinging or excessively seeking reassurance. While attachment avoidance is characterized by the self-protective avoidance of closeness with attachment figures in times of distress (Fraley and Shaver, 2000). Even though the attachment quality formed in infancy has been shown as relatively stable in later stages of life, across close relationships (Fraley, 2002; Pinquart et al. 2013) and cultures (Mesman et al. 2016), it continues to be sensitive to parenting quality in childhood and its eco-cultural context (e.g., Keller, 2013). Two parenting dimensions, warmth and psychological control, play a meaningful role in this process.

Parental warmth, psychological control and their combined effects in development

Warmth is grounded in parental acceptance (versus parental rejection) and refers to the affection, love, care comfort, appreciation, kindness, regard, and support or nurturance parents can feel or express toward their children (Khaleque, 2013; Skinner et al. 2005). Furthermore, parental *positivity* may be treated as related indicator of warmth. It is visible in parental love expressions (e.g., verbalization), physical closeness with the child (especially when the child is small), interest in the child's issues, and time spent together (Lubiewska et al. 2022). The developmental outcomes of parental warmth are positive, as it promotes healthier emotional (Pastorelli et al. 2021), social (Yavuz et al. 2022), and cognitive development (Holochwost et al. 2020) in children and fosters the development of traits such as empathy (Zhou et al. 2002) and self-esteem (Wang et al. 2023). Studies also reveal that warmth protects children against factors threatening their secure attachment (Darling and Steinberg, 1993; Hughes et al. 2005; Karavasilis, Doyle, and Markiewicz, 2003; Kerns et al. 2011; Lippold et al. 2016; Rothenberg et al. 2020a and 2020b),

Psychological control, also referred to as *coercion* (Skinner et al. 2005) is another parenting dimension central to a child's development. It is based on a set of parenting strategies where a parent aims to emotionally manipulate, invalidate, or inhibit their child in order to gain their compliance (Barber, 1996). This includes parenting tactics such as guilt induction or love withdrawal, as well as behaviours that disregard and restrict a child's autonomy (Choe and Read, 2019; Skinner et al. 2005). Contrary to parental warmth, the developmental consequences of psychological control are negative, as it has been linked to an increased prevalence of internalizing (Pinquart, 2017a; Chyung et al. 2022) and externalizing (Pinquart, 2017b) disorders. Moreover, these effects remain consistent across diverse cultural contexts (Scharf and Goldner, 2018). Studies also reveal that parental psychological control introduces a threat to a child's optimal development, including the risk of insecure

attachment (Barber et al. 2005; Hughes et al. 2005; Karavasilis et al. 2003; Koehn and Kerns, 2018; Kim et al. 2021; Leondari and Kiosseoglou, 2002; Levitt et al. 2020; Wang et al. 2021).

Parenting researchers often assume that a combination of warmth and control may result in distinct parenting patterns (Baumrind and Black, 1967; Padilla-Walker et al. 2021), yet fewer studies analyzed their combined interaction-like effect on child developmental outcomes. Warmth (aiming to maintain a close relationship) and psychological control (aiming to control the child) fulfil different functions in parenting. Thus their interaction may operate differently and trigger distinct effects in children. It is possible that parental warmth may protect against the negative effects of parental psychological control. Yet, parental warmth may also function as part of a psychologically controlling parenting strategy or operate independently of parental psychological control.

Studies examining the combined effects of both parenting dimensions are inconsistent. Some of them support conclusions about the protective effect of parental warmth against psychologically controlling or negative parenting (Daspe et al. 2019; Nelson et al. 2011; Silva et al. 2020). This *buffering* model was supported by a study conducted by Harper and colleagues (2003) where parental warmth was found to mitigate negative associations between parental control and attachment security of adult children. Other studies did not find support for the buffering model and revealed the opposite, the *ambiguity* model (Etkin et al. 2014; Lubiewska et al. 2018) also in the attachment field (Harper et al. 2003). This paradoxical effect of parental warmth may arise from the ambiguity that a child might experience when a parent uses inconsistent and contradicting positive (warmth) and negative (psychologically controlling) parenting practices (Soenens, 2007). Such a sense of ambiguity may occur when the mother is verbalizing love to the child (warmth) followed by bringing up the child's past mistakes or saying what the child should do (psychological control). As a result, the child might interpret their mother's warmth as part of her psychologically controlling parenting strategy.

Inconsistency in findings supporting both models may depend on various factors influencing the context of parenting, such as the family's emotional climate (Harper et al. 2003; Lubiewska et al. 2018). The cultural background of a child's development and parenting also seem to play an important role, as cross-national studies reveal culture specific patterns of positive or negative associations between parental warmth and psychological control (Lansford et al. 2021; Trommsdorff and Rothbaum, 2008). This set of evidence may suggest that the combined effect of both parenting aspects may be culture dependent. As a result, there may be varying protective (buffering) or enhancing (boosting) effects of maternal warmth on the associations between maternal psychological control and child attachment.

Parenting control, warmth, and their combination as cultural adaptations

Parenting is a cultural adaptation that aims to maximize the fit of children to the adaptational demands and social norms applicable to their environments (Henrich, 2015). Environments differ not only culturally, ecologically but also, as described in classical anthropological works (Benedict, 1946; Mead, 1970; Riesman, 1960), in the pace of social changes (Lesthaeghe, 2010), and the number of opportunities and limitations for human development (e.g., modernization, spread of education, or respect to the rule of law). We propose that in different eco-cultural contexts, the *control-dominant parenting model* or the *warmth-dominant parenting model* are differentially adaptive supporting the buffering or the ambiguity model.

Numerous macro-level indexes may be used to group countries varying in cultural and developmental contexts of our interest.

Following our previous studies on parenting (Lubiewska et al. 2025) the present study targets three interrelated characteristics of national cultures. Firstly, numerous empirical results have consistently revealed the adequacy of using collectivism and individualism as key cultural characteristic explaining cross-national differences in the quality of parenting (e.g., Bornstein, 2022; Trommsdorff and Rothbaum, 2008) and attachment (e.g., Chopik and Edelstein, 2014; Friedman et al. 2010; Keller, 2013; Lubiewska et al. in press; Schmitt et al. 2004). Secondly, the value orientation prevalent in a given society (Inglehart, 1997) may be helpful in explaining differences in preferences for one of the proposed parenting models. Parents in national societies (oftentimes also collectivistic) in which individuals are focused on meeting survival needs, might be more likely to prefer an interdependent orientation in socialization (Keller, 2013; Trommsdorff and Rothbaum, 2008) and a control-dominant parenting model. Parents in societies with cultures focused on self-expression and rational-secular values (oftentimes also individualistic) may be more prone to prefer the warmth-dominant parenting model that is advised in parenting guidebooks. Thirdly, as the characteristics above coexist within the majority of world cultures (Kagitcibasi, 1996), we propose that the pace of social changes in the country may provide further explanation. Social changes in parenting strategies (oftentimes unconsciously used by parents) may occur more slowly than changes in declarative attitudes in a society (e.g., values and individualistic orientation declared by respondents in social surveys e.g., on collectivism). In contexts where social change has progressed slowly over time (e.g., in post-communist countries), the control-dominant parenting model may still prevail over the warmth-dominant parenting model, even though parents may verbally express a warmth-based model. In countries with stable and long lasting democratic traditions, a warmth-dominant parenting model may be preferred.

We propose using the culture fit hypothesis (Friedman et al. 2010), to explain why and how a parenting model preference in a given society may be useful in explaining the occurrence of the buffering or the ambiguity model in the association between parenting and child attachment. Applied to our example, the culture fit hypothesis postulates that when the social endorsement of parental psychological control is more normative (like in the control-dominant parenting model), then its effects on child attachment (and vice versa) are expected to be weaker. Moreover, in societies using the control-dominant parenting model, an overt expression of parenting warmth may be less socially normative and practiced. Thus, the effects of parental warmth on a child's attachment may be stronger than the effects of parental psychological control. This may include a more frequent or normative occurrence of the buffering effect on the association between parental psychological control and child's attachment. Such expectation seems to be supported in our previous qualitative study where we found that maternal strict and punitive control had stronger endorsement by the Polish and Turkish mothers than by the Dutch mothers (Lubiewska et al. 2023). Further evidence comes from another study we conducted (utilizing data from the current Study 1), where the culture fit hypothesis was found as adequate in explaining culture-dependent effects of maternal warmth (child-directed positivity) on child attachment (Lubiewska et al. 2022; Sümer et al. 2023). Specifically, maternal warmth was associated with the child's attachment security and insecurity dimensions more strongly in the Polish than in the Turkish and Dutch children.

Aim and hypothesis

In the present study, we aim to answer whether relations between maternal psychological control and child attachment security (indicated by safe haven, secure base and low levels of attachment

Table 1 Country-level Scores of Characteristics of National Cultures.

Country	Survival (year)	Collectivism
Netherlands	2.388 (2022)	−101
Norway	3.031 (2018)	−118
Poland	0.598 (2017)	−22
Belarus	−0.321 (2018)	-
Turkey	−0.704 (2018)	−11

Data sources and meanings of scores: Survival - <https://www.worldvaluessurvey.org/VVVSNewsShow.jsp?ID=467>, scores range from positive to negative with values closer to zero signifying that neither survival nor self-expression values are more dominant in a country; higher scores (above zero) indicate a greater focus on self-expression (e.g., tolerance to others) whereas lower scores (below zero) indicate a greater focus on survival (e.g., emphasizing economic and physical security, such as food, shelter, and safety); Collectivism - scores range from positive to negative with values closer to zero signifying a balance between individualism and collectivism; higher scores indicate higher collectivism (e.g., a greater focus on harmony in groups such as avoiding conflicts, forgiving, conformity) and lower individualism (e.g., prioritizing self-reliance); all of the selected country's scores are negative (below zero) meaning that they lean toward individualism, e.g., lower scores in the Netherlands or Norway reflect lower collectivism and higher individualism (Minkov & Kaasa, 2018).

anxiety and avoidance) are moderated by maternal warmth with a pattern that supports the *buffering* model or the *ambiguity* model in countries differing in: survival (versus self-expression) values (Inglehart, 1997), collectivism (versus individualism) (Minkov et al. 2018) and the recent history of a communist versus capitalist socio-political system.

Based on the characteristics of national-cultures (see country scores and their descriptions presented in Table 1), we hypothesized that maternal warmth will moderate the negative association between maternal psychological control and child attachment security dimensions following the patterns of the ambiguity model in the Netherlands and Norway, and consistent with the buffering model in Turkey, Belarus and Poland.

Testing combined, not single, effects of parenting warmth and psychological control on child's attachment security and insecurity dimensions may extend our knowledge in at least two ways. First, unfolding patterns in cross-cultural differences in the buffering versus ambiguity model may provide evidence that allows us to reformulate and test hypotheses about culture-specific parenting models (e.g., control-dominant and warmth-dominant) in future studies. Second, testing both attachment security and insecurity dimensions in a cross-cultural study may add to our understanding of culture-specific and culture-sensitive parenting-related aspects of attachment development in middle childhood. To test our hypotheses and validate our findings, we analyze data from two studies that used the same child attachment measures but differed regarding: instruments for assessments of maternal warmth and psychological control; recentness of parenting memories (current experience versus retrospective memories); source of parenting information (mother versus child); and child age (see Table 2). Retrospective memories of childhood parenting experienced by our respondents, shortly after the collapse of communism in Poland and under dictatorship rule in Belarus, provide a very specific and unique cultural context to test our hypothesis in Study 2.

Methods

Sample

Study 1. Participants include a total of 758 mother-child dyads from Poland ($n = 258$), the Netherlands ($n = 250$), and Turkey ($n = 250$). Mothers aged between 24 and 50 ($M = 38.5$; $SD = 5.5$) and their children between 8 and 12 years old ($M = 10$; $SD = 1.4$) were included in the sample. Data was collected under the umbrella project titled *Combination of Emic and Etic Approach to Parenting and Attachment* (CEE-PaAtt) by professional survey companies in major cities in Poland, the Netherlands, and Turkey.

Table 2 Summary of Differences in Study 1 and Study 2 Regarding the Sample, Data collection Countries, Sources of Warmth information (Informant), its Indicators, and Type of Information about Maternal Parenting.										
Study	Sample		SEM models	Child attachment indicators	Maternal parenting					
	Respondents	Data collection countries (<i>n</i>)			Warmth			Psychological control		
					Indicators	Informant	Type of information	Indicators	Informant	Type of information
1	Children (between 8 and 12) and their mothers	Poland (258) Netherlands (250) Turkey (250)	Model 1	Security: Mother as Safe Haven and Secure Base	Positivity	Mother	Current parenting	Psychological control (Barber, 1996)	Child	Current parenting
			Model 2	Insecurity: Anxiety and Avoidance in relation with mother	PASQ-Warmth	Child				
2	Adults	Poland (140) Norway (57) Belarus (110)	Model 1 ^a	Security: Mother as Safe Haven and Secure Base	PASQ-Warmth	Adult child	Retrospective memories of maternal parenting	PASQ-coercive control	Adult child	Retrospective memories of maternal parenting
			Model 2 ^a	Insecurity: Anxiety and Avoidance in relation with mother	PASQ-Warmth					

^aModels in the Norwegian sample were tested with regression models not with the use of the SEM method. *SEM* Structural Equation Modelling method. *PASQ* Parents as a Social Context Questionnaire (Skinner et al. 2005).

Study 2. Data from 320 young adults aged from 18 to 35 years old ($M = 25$; $SD = 5.18$) from Poland ($n = 140$), Belarus ($n = 110$), and Norway ($n = 57$) were collected in Study 2 via Facebook groups and word-of-mouth.

In both studies, participants answered questions in either Turkish, Dutch, Polish, Russian, or Norwegian, depending on the country. If the already validated versions of the scales were not available, translation and back-translation into English were completed by native speakers of each language. Ethical committee approval was obtained for both studies.

Measures. The same attachment security and insecurity instruments were used in Study 1 and Study 2 (Table 2). Two scales assessing maternal warmth were used in Study 1 and one of them was also used in Study 2. Maternal psychological control was assessed using different instruments in Study 1 and Study 2.

Child attachment

Attachment security. Two 3-item-subscales of the Network of Relationships Inventory-Behavioural Systems Version (Furman and Buhrmester, 2009) were used to assess the extent to which children treat(ed) their own mother as a safe haven in times of distress (e.g., “How much do you seek out your mother when you’re upset?”) and a secure base for exploration (e.g., “How much does your mother encourage you to pursue your goals and future plans?”). Children in Study 1 used a Likert scale ranging from (1) “never” to (5) “always” to respond to these items, while adults in Study 2 used a Likert scale ranging from (1) “little or none” to (5) “the most”. Reliability was acceptable for the safe haven subscale (alphas of 0.873, 0.799, and 0.833 in the Polish, Dutch, and Turkish groups) in Study 1 and in Study 2 (alphas of 0.911, 0.946, and 0.926 in the Polish, Norwegian, and Belarusian groups, respectively). Alphas were also acceptable for the secure base subscale (alphas of 0.770, 0.774, and 0.757 in the Polish, Dutch, and Turkish groups) in Study 1 and in Study 2 (alphas of 0.820, 0.931, and 0.921 in the Polish, Norwegian, and Belarusian groups). Measurement equivalence analyses supported partial

scalar invariance of the scale in Study 1 (after releasing two intercepts from equality constraints differences in CFI was 0.010; χ^2 of 232.360, $p < 0.001$) and study 2 (after adding two modification indices; $\Delta\chi^2 = 12.376$, ns).

Attachment insecurity. The items from the Experience in Close Relationships - Child version (Brenning et al. 2011) were used in Study 1. Attachment anxiety in relation to mother was assessed using 10 items (e.g., “I’m worried that my mother doesn’t really love me”), whereas attachment avoidance was assessed with 9 items (e.g., “I get nervous when my mother wants me to share really close moments”). Children reported their agreement with items using a Likert scale ranging from (1) “totally disagree” to (5) “totally agree” and from (1) “totally disagree” to (4) “totally agree” in Study 2. Reliability in Study 1 was acceptable for anxiety (alphas of 0.934, 0.869, and 0.902 in the Polish, Dutch, and Turkish groups) and avoidance (alphas of 0.918, 0.881, and 0.891 in the Polish, Dutch, and Turkish groups). Measurement equivalence analyses supported partial scalar invariance of the scale (Lubiewska et al. 2022).

Three anxiety items (e.g., “I’m afraid that this person may abandon me”) and four avoidance items (e.g., “It helps to turn to this person in times of need; recoded item”) from the Experience in Close Relationships - Relationship Structures Questionnaire (ECR-RS; Fraley et al. 2011) were used in Study 2. Reliability of both subscales was acceptable for anxiety (alphas of 0.792, 0.792, and 0.854 in the Polish, Norwegian, and Belarusian groups) and avoidance (alphas of 0.880, 0.889, and 0.884 in the Polish, Norwegian, and Belarusian groups). Measurement equivalence analyses supported partial metric invariance of the scale (after the inclusion of two modification indices; $\Delta\chi^2 = 8.643$, ns).

Maternal psychological control indicators. In Study 1, children reported their evaluation of maternal parenting control by answering eight Psychological Control Scale – Youth Self-Report (Barber, 1996) items (e.g., “My Mother is a person who would like to be able to tell me how to feel or think about things all the

time”). They used a Likert scale ranging from (1) “totally disagree” to (5) “totally agree” to answer.

Confirmatory factor analysis results in the total sample revealed low factor loadings of item 4 (“My mother is a person who acts like she knows what I’m thinking or feeling.”) and in group-specific analysis item number 5 (“My mother is a person who would like to be able to tell me how to feel or think about things all the time.”) had low factor loading in the Turkish subsample. Both items were excluded from further analyses. As the model had poor fit parameters in the Dutch group (RMSEA = 0.092, CFI = 0.865, and SRMR = 0.060) covariance between two items was added to the model and increased the model fit in this group. The final model fit was acceptable in the total sample, RMSEA = 0.053, CFI = 0.988, SRMR = 0.024. Reliability of the scale was good across the Polish and Turkish groups (alphas of 0.878 and 0.804) and acceptable in the Dutch group (alpha of 0.687). Results of measurement equivalence of the scale across groups evidenced metric invariance (differences in CFI of zero; and χ^2 of 9.893, *ns*).

Adults in Study 2 responded to four items of the Parents as a Social Context Questionnaire (Skinner et al. 2005) assessing retrospective memories of maternal coercion (e.g., “My mother was always telling me what to do”) referred to as psychological control (Skinner et al. 2005). Reliability of the subscale was acceptable (alphas of 0.829, 0.787, and 0.845 in the Polish, Norwegian, and Belarusian groups). Measurement equivalence analyses supported scalar invariance ($\Delta\chi^2 = 6.85$, *ns*).

Maternal warmth indicators. We used two self-report scales to assess maternal warmth in relation to the child. In one measure mothers were asked to rate behaviours through which they express positive affect to their child. The average score of items indicating maternal love and her positive child-directed approach was the second maternal warmth indicator used in Study 1 and the only warmth indicator used in Study 2.

Maternal positivity. An emic Maternal Positivity scale was used as one of the warmth measures in Study 1. The scale was developed through interviews with mothers in Poland, Turkey, and the Netherlands in the CEE-PaAtt project (see Lubiewska et al. 2022, for details). The scale consisted of seven items (e.g., “I express positive feelings towards my child by hugging.” or “I express positive feelings towards my child by spending time together.”). Maternal positivity describes a specific behaviour or action that mothers may engage in to convey affection and warmth to their child. Mothers used a Likert scale ranging from (1) “totally disagree” to (5) “totally agree” for their answers. Reliability of the positivity scale was acceptable (alphas of 0.844, 0.834, and 0.900 in the Polish, Dutch, and Turkish groups). Metric invariance was evidenced (differences in CFI of 0.003; and χ^2 of 38.766, $p < 0.050$).

Maternal warmth. In both Study 1 and Study 2, the following two items assessing warmth were used: “My mother lets me know she loves me” and “My mother is always glad to see me”. These items were taken from a subscale of the Parents as a Social Context Questionnaire (Skinner et al. 2005). Children rated their agreement with the statements above using a Likert scale ranging from (1) “totally disagree” to (5) “totally agree” in Study 1; and (1) “totally disagree” to (4) “totally agree” in Study 2. Due to the two-item composite score, the reliability and measurement equivalence of this maternal warmth indicator could not be calculated.

Data analysis strategy. Before reporting the results of the main analyses, we present the results of descriptive and correlational analyses. Scalar and metric measurement equivalence were tested for

each scale in each study across groups. As we were not aiming to test mean level differences in parenting or attachment, evidencing the scalar level of measurement invariance was not necessary.

We used structural equation modelling (SEM) to test our hypothesis in all groups with the exception of the Norwegian group analyzed in Study 2. As the sample size was small in this group, thus not suitable for SEM analyses, we tested our hypothesis using regression models with moderation effects tested in PROCESS SPSS (Hayes, 2022). Four identical SEM models were tested in Study 1 and Study 2. Models differed with attachment; two security (mother as safe haven and secure base) and two insecurity (anxiety and avoidance) dimensions were tested as endogenous variables. In each model, maternal warmth and country denomination were tested as combined moderators of relations between maternal psychological control latent indicators and child’s attachment latent factors. To test the moderated moderation effect, paths between the interaction term and attachment latent factors were constrained equally across country groups, and differences in model fit were investigated. We decided that in case we could not fully support a moderated moderation effect within any of the four tested models, we will further analyze country-group differences in control*warmth effects on attachment to ensure that any clear patterns of results (if these exist) that may be blurred in the total sample results are unfolded.

In all analyses, indicators of latent variables were randomly grouped into three parcels per each latent variable. As our scales are unidimensional this strategy may be used in the present study to decrease number of degrees of freedom in our path models (Kline, 2016) and avoid problems with model estimation (by reducing number of observable indicators used as indicators of the warmth*psychological control interaction term when both exogenous variables are continuous). Latent variables (positivity or warmth score composed of two averaged items) were indicated by one-variable indicators in Study 1 and Study 2. We decided to use one average score of warmth or positivity as an observed variable of the warmth latent factor to avoid problems of collinearity and model estimation that might occur when the interaction term would have many highly intercorrelated indicators (pairwise combinations of all six observable variables). All analyses were run twice for security and insecurity models in Study 1 and repeated in Study 2. We used the R package ‘lavaan’ (Rosseel, 2012) for SEM analyses. Simple slopes were generated to visualize significant moderation effects with the use of the R package ‘semTools’ (Jorgensen et al. 2018). The moderator and independent variable were double-centred before the moderation model was tested.

Results

Descriptive statistics. Results presented in Table 3 revealed moderate to strong relations between all variables analyzed in Study 1. Positivity and warmth showed a moderate positive relationship with child attachment security dimensions and a moderate negative relationship with attachment insecurity dimensions.

The association between maternal psychological control and child attachment security dimensions was negative and moderate, whereas the relationship between maternal psychological control and child’s attachment insecurity dimensions was moderate and positive. Furthermore, positivity and warmth were negatively and moderately related to maternal psychological control. Results of Study 2 are presented in Table 4 and follow results from Study 1.

Moderating effects of maternal warmth

Security model in Study 1. Results of analyses testing the moderation effect of maternal positivity in the total sample revealed, as shown in Fig. 1, a significant moderation effect of the interaction between maternal positivity and psychological control (psychological control*positivity interaction term) on child’s safe haven (interaction

Table 3 Study 1: Descriptive Statistics of Observed Variables.							
Variables	Child attachment				Parenting		
	Safe haven	Secure base	Anxiety	Avoidance	Positivity	Warmth ^a	Psychological control
Safe haven							
Secure base	0.542***						
Anxiety	−0.271***	−0.166***					
Avoidance	−0.494***	−0.364***	0.556***				
Positivity	0.374***	0.372***	−0.328***	−0.388***			
Warmth	0.408***	0.400***	−0.306***	−0.421***	0.334***		
Psychological control	−0.307***	−0.255***	0.688***	0.450***	−0.315***	−0.316***	
Mean values (SD)							
Polish group	3.543 (0.942)	3.746 (0.859)	2.004 (0.860)	2.016 (0.723)	4.195 (0.547)	4.378 (0.699)	2.168 (0.877)
Dutch group	3.256 (0.953)	3.352 (0.836)	1.544 (0.509)	1.933 (0.608)	4.184 (0.513)	4.088 (0.576)	1.822 (0.569)
Turkish group	4.019 (0.936)	4.076 (0.834)	1.842 (0.799)	2.013 (0.838)	4.423 (0.678)	4.170 (0.793)	1.903 (0.731)
***p < 0.001. Mean level differences between groups were not tested. ^a average score of two warmth items.							

Table 4 Study 2: Descriptive statistics of observed variables.						
Variables	Adult child's attachment				Parenting	
	Safe Haven	Secure Base	Anxiety	Avoidance	Warmth	Psychological Control
Safe Haven						
Secure Base	0.607***					
Anxiety	−0.275***	−0.405***				
Avoidance	−0.690***	−0.603***	0.375***			
Warmth (2 items averaged)	0.444***	0.524***	−0.430***	−0.543***		
Psychological control	−0.262***	−0.426***	0.348***	0.368***	−0.383***	
Mean values (SD)						
Polish group	2.973 (1.076)	3.183 (1.009)	1.592 (0.657)	1.826 (0.716)	3.140 (0.678)	2.208 (0.659)
Norwegian group	2.881 (1.167)	3.254 (0.996)	1.433 (0.588)	2.106 (0.777)	3.395 (0.666)	2.325 (0.742)
Belarusian group	2.998 (1.099)	3.138 (1.170)	1.508 (0.568)	1.919 (0.687)	3.144 (0.773)	2.261 (0.624)
***p < 0.001. Mean level differences between groups were not tested.						

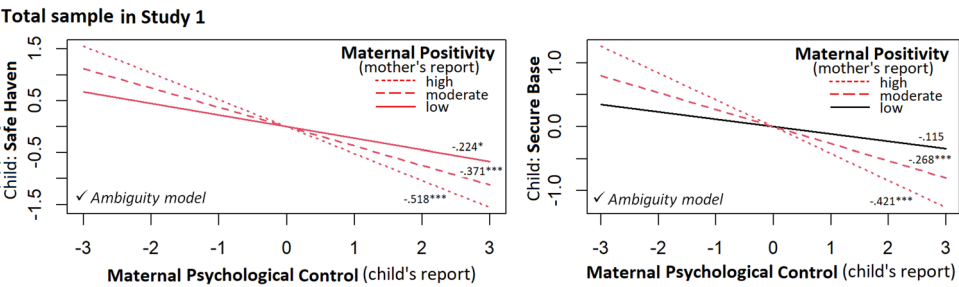


Fig. 1 Relationship between maternal psychological control and child attachment security depending on maternal positivity in Study 1.

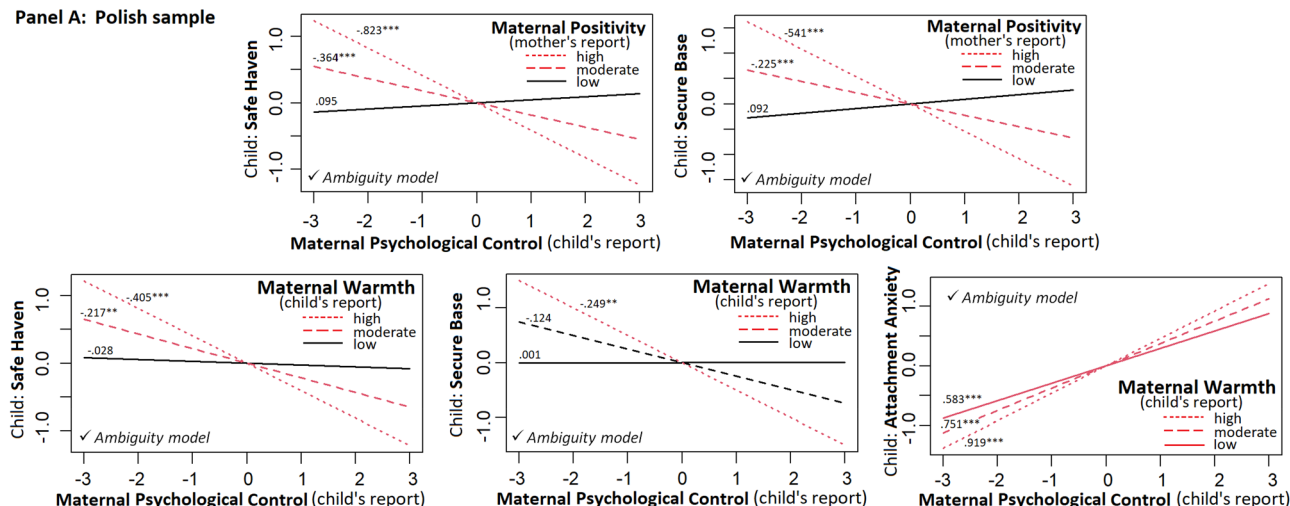
estimate of -0.080 , $p < 0.050$ [-0.155 ; -0.006]), and secure base, (interaction estimate of -0.090 , $p < 0.050$ [-0.169 ; -0.012]). In families where children perceived their mothers as highly positive, associations between maternal psychological control and child attachment security were stronger. In contrast, in families where children perceived their mothers as less positive, these associations were weak or insignificant. These results support the ambiguity model.

Insecurity model in Study 1. Analyses testing the Insecurity model with interaction between maternal psychological control and positivity in the total sample revealed that positivity was not significantly moderating the association between maternal psychological control and child attachment anxiety.

Results of Study 1, testing maternal warmth (another warmth measure) as moderator of relations between parenting control and child attachment, revealed that the effects of psychological control*warmth interaction on safe haven and secure, as well as on attachment avoidance and anxiety, were insignificant.

Security and insecurity models in Study 2. Results of moderation analyses run in Study 2 revealed a lack of significant effects of warmth on relations between maternal psychological control memories and attachment security (secure base and safe haven) and insecurity (avoidance and anxiety) dimensions. These results do not follow the previous pattern of results and do not support our hypothesis.

Panel A: Polish sample



Panel B:

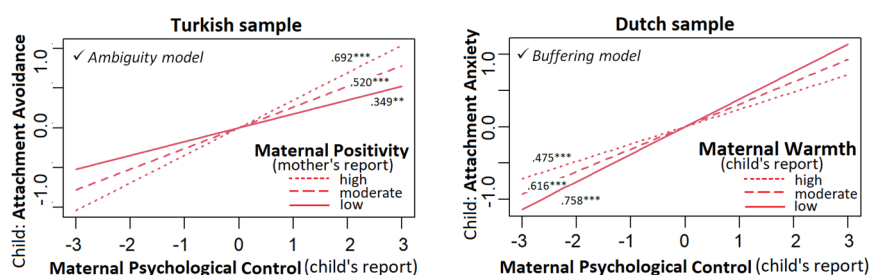


Fig. 2 Relationship between maternal psychological control and child attachment security and insecurity depending on maternal positivity or warmth in Study 1.

Moderating effect of maternal warmth across national groups
Security model in Study 1. Results of moderated moderation analyses revealed a significant moderation effect of country on the relation between the positivity*psychological control interaction term and safe haven ($\chi^2_{\text{diff}} = 10.085$, $p < 0.010$). The moderation effect of country on the relation between the positivity*control interaction term and secure base was also significant ($\chi^2_{\text{diff}} = 5.976$, $p = 0.050$).

Further analysis revealed that the positivity*control interaction term had significant effects on safe haven (interaction estimate of -0.459 , $p < 0.001$ [-0.323 ; -0.113]) and secure base (interaction estimate of -0.316 , $p < 0.010$ [-0.315 ; -0.079]) only in the Polish group. The results shown in Panel A of Fig. 2 support the ambiguity model.

Furthermore, results of analyses testing our hypothesis using warmth (not positivity) as the observable variable revealed that the psychological control*warmth interaction explained attachment dimensions differently at the trend level across groups ($\chi^2_{\text{diff}} = 4.610$, $p < 0.100$). Inspection of interaction effects in each group revealed that associations between warmth*psychological control and child's safe haven (interaction estimates of -0.189 , $p < 0.010$ [-0.254 ; -0.038]) and secure base (interaction estimates of -0.125 , $p < 0.050$ [-0.247 ; -0.007]) were significant only in the Polish group. As also visualized in Panel A of Fig. 2, the pattern of results followed the positivity results and was in line with the ambiguity model.

Insecurity model in Study 1. The effect of the control*positivity interaction term on attachment avoidance was significant only in the Turkish group (interaction estimate of 0.171 ; $p < 0.050$ [0.010 ; 0.251]). Analysis of simple slopes shown in Panel B of Fig. 2 revealed the same pattern of differences as our previous analyses supporting the ambiguity model in the Turkish group.

Results of the Insecurity model revealed two significant and different sign effects. Whereas the effects of psychological control*warmth interaction term on adult child attachment anxiety was positive (estimate of 0.136 ; $p < 0.010$ [0.007 ; 0.167]), visualized in Panel A of Fig. 2 in the Polish group, the same effect was negative in the Dutch group (estimate of -0.237 ; $p < 0.010$ [-0.311 ; -0.073]), visualized in Panel B of Fig. 2). Both patterns of differences in regression slopes support the ambiguity model in the Polish and Turkish groups and the buffering model in the Dutch sample.

Security and insecurity models in Study 2. Results testing our models separately in each group revealed three significant moderation effects of maternal warmth on the relationship between maternal psychological control and attachment dimensions. The psychological control*warmth interaction term was found to be related: (1) weakly and negatively with attachment anxiety of the adult child's in the Polish group (-0.195 , $p < 0.050$ [-0.381 ; -0.010]); (2) moderately and positively with attachment anxiety in the Norwegian group (0.609 , $p < 0.050$ [0.039 ; 1.178]); (3) weakly and negatively with attachment avoidance in the Belarusian group (-0.229 , $p < 0.050$ [-0.401 ; -0.056]). Patterns of simple slopes visualized in Fig. 3 (weakly) followed the ambiguity model only in the Norwegian sample. However, patterns of slopes' differences were in line with the buffering model in the Belarusian sample and in the Polish sample.

Discussion

The present study aimed to investigate the complexity of associations between two core aspects of maternal parenting (warmth and psychological control) and child attachment security (safe haven, secure base and low levels of attachment anxiety and

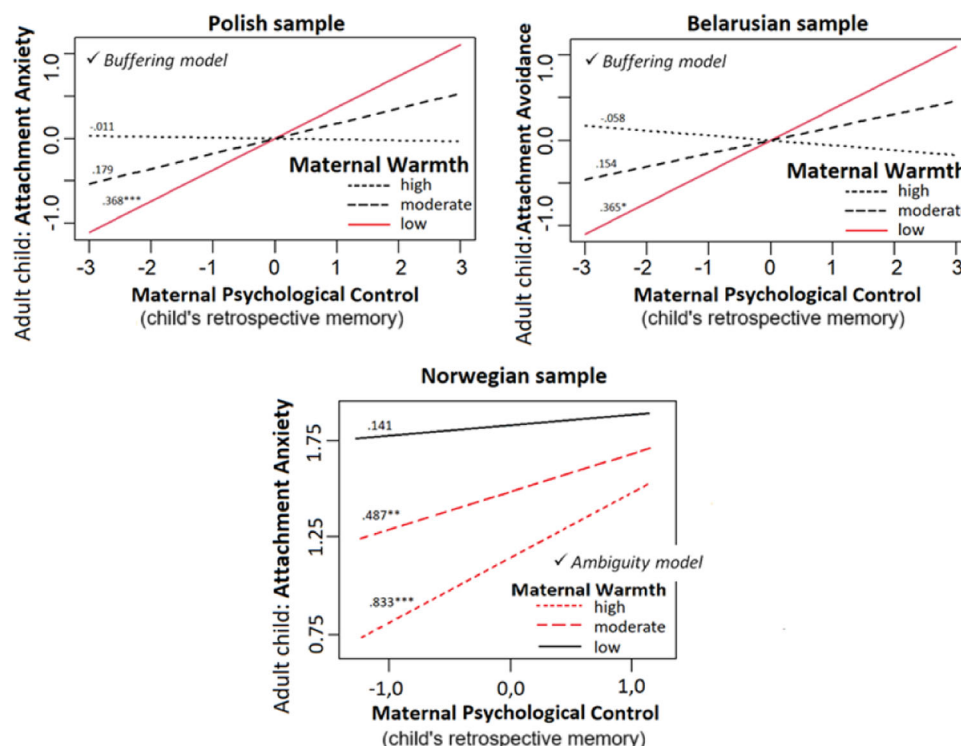


Fig. 3 Relationship between maternal psychological control and adult attachment insecurity depending on maternal warmth in Study 2.

avoidance). In line with previous parenting and attachment studies (Koehn and Kerns, 2018), results of the present study revealed that child's attachment security was positively related to maternal warmth and negatively to maternal psychological control. Yet, the main novelty of our study addressed a deeper exploration of how parental warmth and psychological control may interact in shaping a child's attachment security or insecurity in varying socio-historical and cultural contexts, namely in collectivistic Turkey, post-communist Poland and Belarus, as well as in Norway and the Netherlands, the two countries contrasted by long-lasting democracy and high individualism. Two parenting models were introduced and hypothesized to be differentially revealed in these countries.

First, we proposed that parenting tactics in individualistic cultures with long-lasting democracy and slow but systematic social changes in parenting may be characterized more by parental acceptance and less by social tolerance to psychologically controlling parenting tactics. We hypothesized that in such a context, mother's simultaneous use of both parenting strategies would rather result in a child's interpretation of maternal acceptance as a part of her psychologically controlling parenting strategy. This is described in the present study as the *ambiguity model*. Our expectation regarding the socio-political and cultural background as possibly fostering this model was supported in the sample of adult Norwegian children, where maternal warmth was found as boosting the negative effects of maternal psychological control on child attachment anxiety.

Second, we proposed that parenting strategies implicitly (rather than explicitly) used in more collectivist cultures and countries with a sudden shift from totalitarianism to democracy (where social changes emerged suddenly, like in post-communist countries) may be more based on psychologically controlling parenting strategies and less on parental warmth. As a result, maternal warmth, as not frequently used in such cultures, might be perceived by children as supportive. Thus, it might weaken the negative effects of maternal psychological control on children,

described in the present study as the *buffering model*. Our results provided evidences supporting this model in two samples of adult children in Poland and Belarus. We found that their recollections of maternal warmth in adulthood buffered (weakened) the associations between memories of maternal psychological control and their mother-related attachment anxiety and avoidance.

These findings may reflect the cultural heritage of traditional, control-dominant parenting in these post-communist societies, which may be less present today in the Norwegian sample. There is a saying that exemplifies this heritage, and it is still a commonly heard argument provided by older generations of Poles recalling their own childhood parenting-related memories, "They beat me and that's why I grew into a man." This saying indicates that adults understand the reason why their own parents used psychologically controlling or physically punitive parenting strategies. The buffering effect of maternal warmth, found in the Polish and Belarusian adults, may show such a reflection-based understanding where memories of maternal warmth are viable to shape the interpretation of maternal psychological control, suppressing its negative effect on the current attachment to one's own mother. This (re)interpretation of recalled parenting may not be taking place in the Norwegian adults due to the different culture and long-lasting stability and dominance of the warmth-dominant parenting model. In the Norwegian (as well as in the Dutch) society, a shift in parenting from the traditional control-dominant parenting model to the warmth-dominant parenting model might have taken place earlier than in post-communist countries and without a sudden breaking point in 90 s, when the iron curtain's fall that opened the minds of parents to Western parenting theories highlighting the importance of parental warmth for child development (e.g., Lubiewska, 1998).

Even though the results of Study 2 described above support both parenting models in the hypothesized socio-political and cultural contexts, a set of results from Study 1 provided opposite evidence suggesting that the socio-cultural logic presented above

may not be applicable for interpreting immediate parenting effects on child's attachment in middle childhood.

Experience of current parenting and child attachment. Not in line with our hypothesis, results of Study 1 revealed that the ambiguity model more appropriately explained child's perception of parenting in the Polish and Turkish samples, whereas the buffering model more adequately explained the perception of parenting of the Dutch children. We propose two explanations for these results, addressing child development and characteristics of national cultures less associated with individualism-collectivism and more with cross-cultural differences in communication patterns.

First, children in middle childhood, regardless of country, may not be developmentally ready to reflect on and understand the reasons why their parents use certain strategies (Piaget and Inhelder, 1972). Thus, they may not be able to weigh the importance and meaning of parental warmth against psychological control in their own development. Parenting behaviours associated with both parenting strategies may be perceived and processed by children only in real-time situations where these behaviours appear. Children may later generalize these experiences without reflection. As cognitive development progresses in adolescence and adulthood, children might be able and willing to reinterpret the parenting currently experienced by them or from their childhood. As the results of Study 2 suggest, this interpretation may be embedded in the prevalent cultural models of parenting, e.g., the proposed warmth-dominant or control-dominant model. This contextualization of Study 1 findings suggests culture-universal and developmentally-gearred associations between parenting and attachment of the school-age children. Yet, the Study 1 findings revealed culture-specific patterns of this association that contradict our hypothesis and Study 2 findings.

Namely, in Study 1 maternal warmth perceived by children was found as debilitating or buffering the effects of maternal psychological control on child's attachment insecurity in the Polish and Dutch samples, respectively. When interpreting these results, we propose that next to the already discussed characteristics of national cultures the communication patterns traditionally embedded in the Dutch and Polish cultures and the pace of social changes in parenting may be helpful in explaining patterns of results observed in Study 1.

The Dutch communication style is direct, whereas it is more indirect in post-communist societies (Meyer, 2015). This means that the Polish mothers may be less direct in communicating with their own children than the Dutch mothers. Therefore, the child's interpretation of maternal parenting behaviours may be more difficult for the Polish than for the Dutch children. Early in their life, Polish children may learn to interpret maternal warmth expression as a part of psychologically controlling maternal parenting strategies (e.g., she verbalizes love because she wants me to comply her). As an outcome and in line with the ambiguity model, maternal warmth may boost the negative effects of psychological control in Polish children, undermining their attachment security. The Dutch children may understand warmth as it is expressed without its additional contextualization in maternal psychological control strategies which is more in line with the buffering model.

Furthermore, it is also possible, though not revealed in our study, that the timing of both parenting strategies may differ across cultures. Parents in Poland may often tell their children "I love you but you should ...". This close connection between love expression and psychologically controlling tactics may be used by a Polish parent to soften psychologically controlling tactics. Yet

this strategy may prompt a child's interpretation of maternal warmth in her psychological control. This link may boost the effects of maternal psychological control on children. The Dutch mothers may be using warm and psychologically controlling tactics separately (versus in combination), and also express warmth more often than the Polish mothers. Thus, it may result in the buffering effect of warmth found in the Dutch children in our study. However, this interpretation needs support from a novel study investigating mother-child interactions in a situation fostering the maternal use of psychologically controlling tactics.

It is worth noting that the proposed explanation, where children may interpret maternal warmth in the context of maternal psychologically controlling behaviours as manipulative and rejecting, is not novel to the parenting field (Soenens, 2007). It also mirrors the traumagenic dynamic of the betrayal model proposed by Finkelhor and Browne (1985). According to this model, an individual may feel more betrayed by a parent who is regarded as nurturing and affectionate than by a parent who is expected to be rejecting or violent. Our cross-age and cross-cultural study may add to this literature by proposing that the accuracy of this model could depend on the child's age and cultural context.

Attachment development in the cultural context. In addition to the culture-informed and development-informed perspective on parenting effects on children provided by the present study, our results may also add onto the cross-cultural studies in the attachment theory (Mesman et al. 2016; Schmitt et al. 2004). Even though attachment is an intrapsychic mechanism regulating one's behaviours, feelings, and cognitions that is universal across cultures (Mesman et al. 2016; Sroufe, 2016), our study sheds light on the attachment construct and the sensitivity of different attachment aspects to cultural influences. Our results show that attachment anxiety and avoidance, rather than attachment security dimensions (safe haven and secure base), are more sensitive to combined and culture-related effects of maternal warmth and psychological control. This finding seems to be in line with previous studies on adults revealing differences in the form of expression and levels of attachment anxiety and avoidance across different cultures (Chopik and Edelstein, 2014; Schmitt et al. 2004).

Limitations. The present study has several limitations. Firstly, the Norwegian sample size analyzed in Study 2 is very small, thus results from this sample should be treated with caution. Yet, as the results in this group supported the ambiguity model, we decided to present these results in the context of support for the buffering model using the Polish and Belarusian samples from the same study. Secondly, we provided evidence from two separate studies that were available, yet not explicitly designed to test our hypothesis. Therefore, a study specifically designed to test this hypothesis could provide a more robust verification of our findings. Moreover, this could increase the risk of Type I errors (false positives), so we aimed to mitigate this risk by reporting confidence intervals and conducting SEM analyses with adequately fitted models, where appropriate. We ran regression analyses (instead of SEM) on the smaller Norwegian sample to prevent model misspecifications. Yet, our results are a good starting point for this endeavour. Thirdly, as our study is based on self-reports, it would be important for future studies to collect observational or longitudinal data to test the nature of the inconsistency between maternal expressions of warmth and psychological control. Such inconsistency may be situational, domain-specific (e.g., achievement motivation), age-specific (e.g., child-report vs. adult child-report), parent-specific, or family-specific. However, based on our study we cannot explain their nature.

Conclusions

The present study provided evidence that maternal warmth may protect against or boost the negative effects of maternal psychological control on child attachment security following either the ambiguity or the buffering model. Even though it is not directly revealed in the present study, the explanation was hypothesized and discussed as depending on: (1) how parenting is assessed (children's perception of currently experienced parenting versus adult children's recollections of parenting experienced in the past); as well as (2) the socio-historically embedded parenting heritage (warmth-dominant versus control-dominant), and (3) the communication pattern (direct versus indirect) prevalent in a given culture. Furthermore, our findings suggest that attachment security may be a more universal aspect of human functioning, while attachment anxiety and attachment avoidance may be a more culture-related and culture-regulated aspects of human functioning.

Data availability

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation. Data for are also available under the following links: <https://figshare.com/s/4c494a5232435fb6df61> for Study 1 and https://figshare.com/articles/dataset/Trust_project_data_Lubiewska_et_al_sav/25463998 for Study 2. The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

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Author contributions

Katarzyna Lubiewska is the corresponding author. Correspondence to: katarzyna.lubiewska@psych.uw.edu.pl. The authors contributed to this work as follows: MZ – data curation, investigation, writing, reviewing, editing, and project administration; KG – data curation, investigation, writing, reviewing, editing, and project administration; NS – data curation, investigation, and project administration. YK participated only in the data collection process in Belarus during her scholarship at the University of Warsaw.

Competing interests

The authors declare no competing interests.

Ethical approval

Ethical committee approval for Study 1 was granted by the Ethical Committee at the University of Kazimierz Wielki in Poland in 2015 (approval No. 12/11/2015) whereas for the ethical committee approval for Study 2 was issued a positive opinion by the Ethical committee of the Faculty of Psychology, University of Warsaw in 2022 (approval No. 3/03/2022). All procedures performed in these studies adhere to the tenets of the Declaration of Helsinki.

Informed consent

Prior to answering survey questions in both studies, all participants provided informed consent. Informed consent was obtained online between February and March 2019 for Study 1 and March 2022 and June 2022 for Study 2. As children were participating in Study 1, parents provided informed consent on behalf of their child. All participants were informed (in an age-appropriate manner) about the aims of the research, their voluntary participation and right to withdraw at any time, how the data will be used, that their anonymity and confidentiality is assured, and that there are no expected risks associated with their participation in the study.

Additional information

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