

Sibling Bullying and Mental Health in Autistic Adolescents:

An Examination of British and Turkish Families

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## Abstract

Sibling bullying is highly prevalent and associated with a range of mental health difficulties. However, the question of whether this is a direct link or an indirect correlation remains unclear. In addition, families where a child is autistic appear to be at heightened risk for sibling bullying, though this population remains under-researched. Moreover, findings from single-culture research indicate varying rates of sibling bullying across cultures, though, to date, there is no cross-cultural understanding of sibling bullying. Finally, Covid-19 holds the potential to trigger sibling bullying, but there is no research yet examining this issue.

To close this knowledge gap, this thesis investigates the dynamics of sibling bullying in families of autistic adolescents from a Western (United Kingdom) and non-Western (Turkey) culture during Covid-19. It uses primary data from parents of 299 British and 171 Turkish autistic adolescents and secondary data from 416 British autistic adolescents.

Findings indicate that about two-thirds of autistic adolescents are involved in sibling bullying, with British ones showing slightly higher rates than their Turkish peers. In addition, sibling bullying appears to be indirectly linked to mental health through detrimental social behaviours (British & Turkish) and emotional regulation and self-esteem (British). Also, individual and family-level correlates of sibling bullying vary between British and Turkish cultures. Finally, Covid-19 seems to have had triple impacts on sibling relationships – negative, positive, and no impact – with its negative impact triggering instances of sibling conflict.

To conclude, British autistic adolescents are at an increased risk for being involved in sibling bullying than their Turkish peers. Additionally, sibling bullying indirectly leads to mental health difficulties through social and emotional dysfunction, and this indirect link varies across cultures. Also, varying risk factors of sibling bullying across cultures highlight the need for culturally sensitive prevention strategies. Finally, there is an increased need for effective prevention strategies due to the heightened risk of sibling bullying during Covid-19.

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## Declaration

I declare that this thesis is a presentation of original work and I am the sole author.

This work has not previously been presented for a degree or other qualification at this University or elsewhere. All sources are acknowledged as references.

I also declare that I wrote my thesis in journal-style academic format with the contribution of four individual studies. Adhering to the thesis formatting [guidelines](#) of the University of York, each study chapter consists of its own introduction, methods, results, and discussion and conclusion sections. Alongside individual study chapters, I provide an overall introduction, literature review, and discussion and conclusion chapters binding all four studies. This academic writing format inevitably leads to the repetition of some key aspects such as the presented literature, reported findings, and subsequent discussions.

I am the leading author of each study presented in this thesis. In regard to the contribution of others, my PhD supervisor, Dr Umar Toseeb, is added as a co-author in each study as he advised on the design, methodology, analysis, and revision of the papers. Additionally, the language experts in the translation committee of Study I, see below, are added as co-authors alongside my PhD supervisor. Finally, Prof. Kathryn Asbury is added as a co-author of Study-IV, see below, in recognition of her guidance on qualitative data analysis. References for each study are given as per the journal-style thesis guideline of the University of York.

## Studies

**Study-I:** Deniz, E., Derinalp, P., Gulkanat, I., Kaz, C., Ozhan, N., & Toseeb, U. (2023). Sibling Bullying in Turkish Adolescents: Translation and Cross-Cultural Validation of the Sibling Bullying Questionnaire. *Journal of Family Violence*, 38(2), 379-392.

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**Study-II:** Deniz, E., & Toseeb, U. (2023). Sibling Bullying and Mental Health in British and Turkish Autistic Adolescents: The Role of Social and Emotional Functioning.

<https://doi.org/10.31219/osf.io/jvzn5> (**Under review** - Journal of Research in Autism Spectrum Disorders)

**Study-III:** Deniz, E., & Toseeb, U. (2023). A longitudinal study of sibling bullying and mental health in autistic adolescents: The role of self-esteem. *Autism Research*, 16(8), 1533–1549. <https://doi.org/10.1002/aur.2987>

**Study-IV:** Deniz, E., Asbury, K., & Toseeb, U. (2023). Sibling Relationships and Parental Interventions to Sibling Bullying During Covid-19: A Qualitative Comparison of British and Turkish Families of Autistic Adolescents. <https://doi.org/10.31219/osf.io/nqez3> (**Under revision** - Journal of Autism & Developmental Language Impairments)

## Abbreviations

AQ	Autism Quotient
ADHD	Attention Deficits Hyperactivity Disorder (ADHD)
APA	American Psychiatric Association
ASC	Autism Spectrum Conditions
ASD	Autism Spectrum Disorder
ASSP	Autism Social Skills Profile
CBCL	Child Behaviour Checklist
CD	Coefficient of Determination
CDCP	Centers for Disease Control and Prevention
CFA	Confirmatory Factor Analysis
CI	Confidence Interval
CIF	Comparative Fit Index
CLS	Centre for Longitudinal Studies
CFA	Confirmatory Factor Analysis
CT	Coercion Theory
CPRI	Cumulative Perpetration Risk Index
CVRI	Cumulative Victimization Risk Index
DEP	Double Empathy Problem
DSM	Diagnostic and Statistical Manual of Mental Disorders
EF	Executive Function
ERC	Emotion Regulation Checklist
EST	Ecological Systems Theory
FIML	Full Information Maximum Likelihood
GFI	Goodness of Fit Indices
MAR	Missing at Random
MCAR	Missing Completely at Random
MCS	Millennium Cohort Study
MICE	Multiple Imputation by Chained Equations
ML	Maximum Likelihood

MLVM	Maximum Likelihood with Missing Values
MMR	Measles, Mumps, and Rubella
NT	Neurotypical
OECD	Organisation for Economic Cooperation and Development
OSF	Open Science Framework
PBIS	Point Biserial
PCA	Principal Component Analysis
PMM	Predictive Mean Matching
QCA	Qualitative Content Analysis
RCT	Resource Control Theory
RMSEA	Root Mean Square Error of Approximation
RSBQ	Revised Sibling Bullying Questionnaire
RSES	Rosenberg Self-Esteem Scale
SBQ	Sibling Bullying Questionnaire
SD	Standard Deviation
SDQ	Strengths and Difficulties Questionnaire
SEM	Structural Equation Model
SEN	Special Educational Needs
SWEMWS	Short Warwick-Edinburgh Mental Wellbeing Scale
SRMR	Standardized Root Mean Squared Residual
TLI	Tucker-Lewis Index
ToM	Theory of Mind
TSBQ	Turkish Sibling Bullying Questionnaire
UNICEF	United Nations International Children's Emergency Fund
WEIRD	Western, Industrialised, Educated, Rich, and Democratic
VIF	Variance Inflation Factor



## **Chapter 1: Introduction**

In this chapter, I will introduce the relevance and timely value of investigating sibling bullying and mental health in families of British and Turkish autistic adolescents. I will start with the importance of researching sibling bullying, emphasising its high prevalence and harmful psychopathological consequences. Next, I will outline the nature of the link between sibling bullying and mental health underscoring the potential indirect correlations between them. Going forward, I will discuss why it is important to study sibling bullying in families where a child is autistic highlighting the fact that findings from the general population may not apply to this specific population. Moving on, I will outline the lack of cross-cultural understanding of sibling bullying and why it is needed and make a case for the value of researching sibling bullying between British and Turkish cultures. Finally, given that the conduct of this thesis coincided with the onset of the Covid-19 pandemic, I will highlight the emerging need to investigate the impacts of Covid-19 on sibling relationships and its potential triggering impacts on bullying. Here, I will also outline my personal reflection on embedding Covid-19 into this thesis. I will conclude this chapter by outlining the problem statement, overarching aim, and structure of my doctoral thesis.

### **1.1 Significance of Studying Sibling Bullying**

Sibling bullying is highly prevalent and a major threat to the mental health of children and adolescents. Previous research has commonly shown that about one in two children is involved in sibling bullying every week (Dantchev et al., 2018, 2019; Duncan, 1999; Wolke & Samara, 2004; Wolke et al., 2015). With its rate exceeding prevalence estimates of peer bullying, about 20-25% (Juvonen & Graham, 2014), sibling bullying is potentially the most prevalent form of violence in children's and adolescents' lives (Hoetger et al., 2015; Perkins & Meyers, 2020; Skinner & Kowalski, 2013). Not only is sibling bullying highly prevalent, but also it leads to harmful consequences such as emotional dysregulation (Fite et al., 2022),

insecure attachment (Bar-Zomer & Brunstein Klomek, 2018), antisocial and risky behaviours (Dantchev & Wolke, 2019), and various forms of mental health difficulties such as anxiety, depression, self-harm, internalising<sup>1</sup> and externalising problems<sup>2</sup> and poorer mental health (Bowes et al., 2014; Coyle et al., 2017; Dantchev et al., 2019; Duncan, 1999; Liu et al., 2020; Menesini et al., 2010; Toseeb et al., 2020b; Tucker et al., 2013). These harmful effects of sibling bullying appear to be present and long-lasting irrespective of the bullying role (i.e., the bully or the victim) (Bouchard et al., 2019) with bully-victims showing the worst outcomes (Dantchev & Wolke, 2019; Dantchev et al., 2019; Toseeb & Wolke, 2022). Its high prevalence and harmful consequences have brought this issue to the fore in today's scientific world.

## **1.2 Sibling Bullying and Mental Health: Untangling the Relationship**

Although previous studies have shown a clear link between sibling bullying and mental health difficulties, whether this is a direct association or an indirect link through other factors has largely remained underexplored. Only one study to date, from the general population, has so far tested the nature of this association (i.e., Fite et al., 2022). These researchers have suggested that instead of a direct link sibling bullying is indirectly related to mental health difficulties. More specifically, they have found that increased rates of sibling bullying victimisation increase emotion dysregulation which, in turn, increases mental health difficulties in adolescents. On this, Fite and colleagues have argued that promoting the emotion regulation skills of adolescents is likely to protect their mental health from the deteriorating impacts of sibling bullying. Given that increased mental health difficulties increase the risk of being involved in sibling bullying (Dantchev & Wolke, 2019), identifying such factors that play a role in between sibling bullying and mental health is likely to reduce

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<sup>1</sup> i.e., emotional difficulties and peer problems.

<sup>2</sup> i.e., conduct problems and hyperactivity/inattention.

their subsequent bullying experiences. Hence, to improve future preventative measures, it is important to direct more scientific attention to the nature of the link between sibling bullying and mental health and to explore what other factors, if any, play a role in this relationship.

### **1.3 Sibling Bullying When A Child Is Autistic: An Overlooked Population**

To date, there is a dearth of evidence about the dynamics of sibling bullying in families where a child is autistic. The limited evidence, however, suggests that autistic individuals are more likely to be involved in sibling bullying than their non-autistic peers (Little, 2002; Toseeb et al., 2018, 2020a). The existing literature fails to address whether such differences in the prevalence of sibling bullying also resemble the potential differences in its risk factors and outcomes between the autistic and non-autistic populations. However, some speculations could be made based on the behavioural and emotional characteristics of autistic children. For instance, while increased time spent together is a risk factor for sibling bullying in the general population, due to increased sibling interaction (Wolke & Skew, 2012), it may not serve as a precursor in families where a child is autistic due to restricted social interest of autistic children (Baron-Cohen et al., 1992; Grelotti et al., 2002). Additionally, the restricted social interest of autistic children may protect them from the deteriorating impacts of certain types of sibling bullying such as indirect sibling bullying. More precisely, social bullying is suggested to have more harmful effects on children's developmental outcomes than direct-sibling bullying (e.g., physical, damaging property) (Dantchev & Wolke, 2019). However, such negative experiences may show little to no impact on the developmental outcomes of autistic children due to their limited social processing skills (Frith & Hill, 2004), desire for loneliness (Kanner, 1943), and restricted social interest (Baron-Cohen et al., 1992; Grelotti et al., 2002). Consequently, it appears important to explore the dynamics of sibling bullying in families where a child is autistic as they may differ from families with non-autistic children.

## **1.4 Investigating Sibling Bullying Across Cultures**

There is an urgent need for a cross-cultural understanding of sibling bullying for three major reasons. First, over 80% of the available literature on sibling bullying comes from Western cultures, thus, little is known about the dynamics of sibling bullying in non-Western cultures (Brett et al., 2023). Second, previous reports have shown that some ethnicities, such as White, are more prone to be involved in sibling bullying than others, such as Black, Asian, and Hispanic (Eriksen & Jensen, 2009; Tucker et al., 2013; Toseeb et al., 2018). While the reasons for this have stayed unclear, one may argue that this may be due to the representation issues in such research as their samples are formed by predominantly White participants. Third, previous research has shown varying prevalence and risk factors of sibling bullying across cultures (Sabah et al., 2022). For instance, despite the high prevalence rates of sibling bullying, recorded in Western cultures such as the United States i.e., 30-80% (Duncan, 1999; Finkelhor et al., 2006; Skinner & Kowalski, 2013; Tucker et al., 2013, 2014), lower sibling bullying rates, i.e., 10-20%, have been found in non-Western cultures such as China (Liu et al., 2021; Peng et al., 2022; Qing et al., 2022). Similarly, potential reasons underlying such variations have remained unknown. Hence, without cross-cultural research, it will remain unknown whether the differences in the prevalence and correlates of sibling bullying reflect the existence of cross-cultural variation or whether they are due to inconsistent practices in its conceptualisation and measurement across cultures.

### ***1.4.1 The Case of the United Kingdom and Turkey***

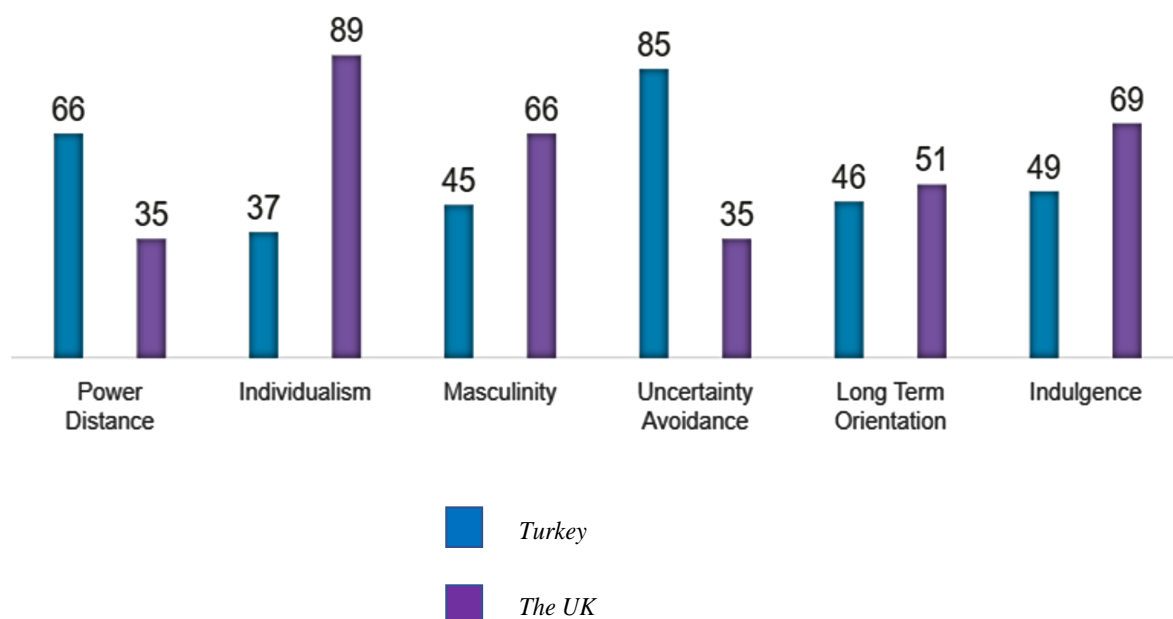
As shown in Figure 4, the United Kingdom (UK) and Turkey substantially differ in their cultural norms and attitudes (Hofstede Insights, 2023). This is likely to play a role in the dynamics of sibling relationships and bullying across these cultures. For example, Turkish people are more collectivist whereas British people are more individualistic, that is, while the idea of “we” is more important in Turkish culture, the idea of “I” comes first in British

culture in personal relationships. This is likely to play a role in the dynamics of sibling bullying across these two cultures. The reason for this is that, compared to individualistic cultures, sibling relationships in families from collectivist cultures are characterised by more warmth, intimacy, and closeness (Cicirelli, 1995; Sabet, 2008; Wolke et al., 2015) which are negatively correlated with sibling conflict and bullying (Buist & Vermande, 2014).

Additionally, given their masculinity and femininity characteristics, Turkish people seem to be less competition-driven than the British. On this, one might argue that the higher competition characteristics of British culture, compared to the Turkish culture, may elevate the risk of sibling bullying in such families by triggering competition over familial resources (Eriksen & Jensen, 2009; Liu et al., 2021; Tippett & Wolke, 2015). Furthermore, British people show significantly higher rates of indulgence meaning that they possess more positive attitudes and are more optimistic than their Turkish counterparts. This could potentially reflect upon the dynamics of sibling bullying too as optimistic personality traits are negatively correlated with sibling bullying (Evans et al., 2019).

**Figure 4 (1.1)**

*The UK and Turkey's scores on Hofstede's cultural dimensions (Hofstede Insights, 2022)*



The UK and Turkey not only differ at cultural-level dimensions but also show significant differences in family structures which may as well create variations in the dynamics of sibling bullying. For instance, the latest OECD (2023a, 2023b) figures show that, compared to British families, Turkish families are larger, formed by more children, and show higher rates of poverty than British families, all of which are potential risk factors for sibling bullying (Bowes et al., 2014; Tippett & Wolke, 2015; Tucker et al., 2014). Additionally, Turkish parents apply punitive and harsh parenting practices more often than British parents (Aytac et al., 2019), which may also further trigger the likelihood of sibling bullying in such families (Tippett & Wolke, 2015; Toseeb et al., 2018; Wolke et al. 2015). There are also family-level risk factors for British children. For instance, the OECD figures indicate that British children are more likely to live in cohabiting families or in single-parent households than Turkish children, which heightens the risk for increased sibling bullying in British families (Tucker et al., 2014; Qing et al., 2022). Additionally, older siblings are more likely to serve as caregivers of younger siblings in Western countries compared to non-Western countries (Updegraff et al., 2011) which may further boost the risks of sibling bullying in British families due to increased unsupervised time spent together (Toseeb, 2022). Hence, ample differences in family characteristics across the UK and Turkey are likely to result in varying dynamics of sibling bullying in these two cultures.

### **1.5 Researching Sibling Bullying During Covid-19**

On top of the widely existing research gap, the emergence of the Covid-19 pandemic brought new uncertainties to the literature mainly around its potential deteriorating impacts on sibling relationships. This is because, during the pandemic, nearly all families across the globe were suppressed with the strict social restrictions which increased parental stress and brought profound challenges to intra-familial relationships (Asbury et al., 2021; Horton et al., 2022; Russell et al., 2020). This deteriorating impact of the pandemic on intra-family

relationships was predicted to show a spillover impact on sibling relationships (Prime et al., 2020) such as increased sibling violence (Perkins et al., 2021). Confirming these, early findings have indicated that the Covid-19 pandemic, and the increased time spent at home, increased daily sibling conflict at home (Salmon et al., 2022), especially in families of autistic children (Tokatly Latzer et al., 2021; Stadheim et al., 2022; Toseeb, 2022). Since constant sibling conflict holds the potential to turn into sibling bullying (Wolke & Skew, 2012), it seems important to investigate the potential impact of Covid-19 on sibling relationships of autistic children where pre-existing challenges were already in place.

### ***1.5.1 Personal Reflection***

My doctoral thesis was at its proposal stage at the onset of the Covid-19 pandemic (January 2020). At that time, I was involved in a research project – Feelings and Behaviours<sup>3</sup> (FaB) – which found that Covid-19 brought profound intra-family challenges to families of children with special educational needs and disabilities, especially those with an autistic child. This personal research experience made me realise that Covid-19 holds the potential to negatively impact sibling relationships and trigger sibling bullying instances at home. Also, there were differing rates of Covid-19 cases and differing stringency of governmental measures in place between the UK and Turkey. Based on this, I predicted that the impact of the pandemic on sibling relationships and bullying may vary between these two cultures. Moreover, increased risks for sibling conflict during the pandemic brought my attention to differing parenting practices between these two cultures as they hold the potential to transform sibling conflict into bullying. Hence, reflecting upon my personal research experience and taking into account early findings in the literature, I predicted that Covid-19 would negatively impact sibling relationships with the potential to trigger sibling bullying. I

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<sup>3</sup> This project examined the impacts of Covid-19 on families where a child has special educational needs and disabilities (see Asbury et al., 2021).

also predicted that such a triggering impact of the pandemic on sibling bullying would likely vary between the UK and Turkey due to differing stringency of social restrictions in place as well as differing parenting styles.

### **1.6 Problem Statement**

Despite the growing volume of research on sibling bullying, the existing literature has severe limitations. For instance, the majority of previous evidence comes from the general population while a very limited understanding of this phenomenon exists in families where a child is autistic. Additionally, despite the growing evidence on the dynamics of sibling bullying, both in the general and the autistic population, the literature is commonly based on reports from Western cultures while very little is known about its dynamics in non-Western cultures. This limits the cross-cultural understanding of this phenomenon, without which, a complete understanding of sibling bullying is not possible. Moreover, even though previous research has shown clear links between sibling bullying and mental health, recent research has indicated that this may be an indirect link through other factors instead of a direct correlation. To the best of my knowledge, no studies to date have looked into the nature of this association in the autistic population. Finally, the emergence of the Covid-19 pandemic has brought new uncertainties regarding its potentially detrimental impacts on sibling relationships. Therefore, the existing literature urgently needs cross-cultural studies to better understand sibling bullying and its dynamics in families where a child is autistic, especially during the Covid-19 period when additional challenges have arisen.

### **1.7 The Current Thesis**

To address the aforementioned uncertainties and limitations in the literature, this doctoral thesis investigates sibling bullying and mental health in families of autistic adolescents from two distant cultures – British and Turkish – during Covid-19. In doing so, it



introduces an overall literature review, a pilot feasibility study, four individual studies, and an integrated discussion. A brief structure of this thesis is outlined below.

[Chapter II](#) is the overall literature review of my thesis. In this chapter, I outline an overview of the existing literature on the following topics of interest: 1) autism (i.e., conceptualisation and characterisation), 2) sibling relationships (i.e., positive and negative aspects), 3) sibling bullying (i.e., theoretical and empirical perspective), sibling bullying across cultures (i.e., evidence from previous single-culture studies), and 5) sibling bullying during Covid-19 (i.e., early findings on the impact of the pandemic). I conclude this chapter by outlining the contribution of this thesis to the existing gaps in the literature.

[Chapter III](#) is a pilot feasibility study. This study aims to report the methodological appropriateness of the proposed cross-cultural study<sup>4</sup>. More specifically, this study tests the feasibility of the four methodological aspects to be applied in the proposed cross-cultural study: *the consent procedure, participant recruitment strategy, inclusion criteria, and measures*. Findings highlight important considerations regarding the necessary methodological revisions to be applied prior to the conduct of the proposed cross-cultural study.

In Chapters [IV](#) to [VII](#), I introduce four studies that collectively form this thesis. To begin with, [Study I](#) (Chapter IV) aims to adapt (i.e., translation and validation) an English-originated sibling bullying measure<sup>5</sup> into the Turkish language to improve the measurement consistency across English- and Turkish-speaking populations. Additionally, [Study II](#) (Chapter V) aims to explore the cross-cultural variability in the dynamics<sup>6</sup> of sibling bullying across families of autistic adolescents from the UK and Turkey. This study also aims to look into the indirect associations between sibling bullying and mental health and whether these indirect associations vary across the two cultures using cross-sectional data. Furthermore,

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<sup>4</sup> i.e., [Chapter V](#).

<sup>5</sup> i.e., Sibling Bullying Questionnaire (Dantchev et al., 2019).

<sup>6</sup> i.e., prevalence and demographic, social, emotional, and mental health correlates.

[Study III](#) (Chapter VI) investigates the direct and indirect associations between sibling bullying and mental health in British autistic adolescents using longitudinal data from a population-based birth-cohort study<sup>7</sup>. This study expands the cross-sectional findings from the latter study by providing a causal perspective on the potential indirect associations between sibling bullying and mental health. Finally, [Study IV](#) (Chapter VII) aims to explore the cross-cultural variations in the impacts of Covid-19 on sibling relationships and parental responses to sibling bullying in British and Turkish families of autistic adolescents. Findings from this study help to interpret the prevalence rates of sibling bullying across the two cultures in Study II.

Finally, in [Chapter VIII](#), I summarise key findings from the four studies, integrate them in a structured discussion, present the strengths and limitations of my thesis, and conclude future directions and implications.

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<sup>7</sup> i.e., Millennium Cohort Study.

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## Chapter 2: Literature Review

### 2.1 Autism

#### 2.1.1 Conceptualisation of Autism

Since the onset of its first conceptualisation, autism has been a topic of interest in the medical field. It was first believed to be part of schizophrenia or schizoid-like personality disorders until an Austrian-American psychiatrist, Leo Kanner (1943), coined it as a unique and distinct neurodevelopmental condition. Given that its roots come from the field of psychiatry, the longstanding impact of the medical approach on the conceptualisation of autism has outweighed its other ways of conceptualisation. However, in the early 90s, an autism self-advocate, Jim Sinclair, published a newsletter for Autism Network International – an organisation formed by autistic individuals and their parents – where they strongly refused the idea of the need for a cure for autistic individuals (Sinclair, 1993). This, with the support from other disability advocates (e.g., physical disabilities), created one of the initial waves of move-away from the medical model of disability which then, collectively, led to new ways of conceptualising disability such as the social model or so-called neurodiversity. Below, I discuss a historical summary of each model alongside their strengths and weaknesses and my positionality.

**Medical Model.** Autism was not scientifically explored or researched until the early 20<sup>th</sup> century when a Swiss psychiatrist, Bleuler (1911) first coined the term “autism” to describe schizoid and schizophrenic characteristics of clinical patients. Bleuler used the term *autismus* – meaning the self in Greek Latin – to describe the socially withdrawn characteristics of patients. He described the behavioural characteristics of autistic patients as “turned in on themselves, averted from reality; the most essential part of their split-up ego is withdrawn into a dream world of ideas and wishes so that external reality is merely a source of the disturbance” (Bleuler, 2011, p.382). Given Bleuler’s great influence on the psychiatric

community at that time (Rutter, 1978), the term autism continued to be used to describe schizophrenic patients until the mid-20<sup>th</sup> century.

Decades after its first occurrence in Bleuler's work, a child psychiatrist from John Hopkins Hospital, Leo Kanner, re-used the term autism to describe the unique behavioural characteristics of his patients. In his article titled *Autistic Disturbances of Affective Contact*, Kanner (1943) presented a clinical case study of 11 patients whom he later diagnosed with *infantile autism*. According to Kanner, the common behavioural characteristics of autistic children were: 1) *inability to relate to other people or situations*, 2) *extreme (autistic) aloneness*, 3) *delay in communication skills*, 4) *echolalic language instead of semantically and conversationally meaningful language*, 5) *restricted interest and repetitive behaviours*, 6) *desire for sameness and resistance to changes*, 7) *a good rote memory*, and 8) *occurrence of the symptoms within the first 30 months of age*. This was the first clinical differentiation between autism and schizophrenia, which Kanner described as:

These characteristics form a unique "syndrome" not heretofore reported, which seems to be rare enough, yet is probably more frequent than is indicated by the paucity of observed cases. It is quite possible that some such children have been viewed as feeble-minded or schizophrenic. In fact, several children of our group were introduced to us as idiots or imbeciles, one still resides in a state school for the feeble-minded, and two had been previously considered as schizophrenic (1943, p.242).

Despite Kanner's re-conceptualisation of autism and arguments on the patients' unique characteristics – that they do not fit into schizophrenia but instead form a unique condition – confusion over the two concepts remained in the literature for a long time. The reason for this was argued to be the unfortunate choice of words by Kanner to introduce a new neurological condition by using a pre-established psychiatric term "autism" (Rutter,

1978). This confusion in the scientific committee led scientists to use two distinct neurological conditions – autism and schizophrenia – interchangeably (e.g., Laufer & Gair, 1969). To overcome this challenge, Rutter (1978) published an article to distinguish autism from schizophrenia by outlining the differences between Bleuler’s concept of autistic aloneness and Kanner’s description of social withdrawal. Based on these differences, Rutter suggested that autism and schizophrenia are qualitatively and meaningfully different forms of psychiatric conditions and that they should not be used interchangeably.

The American Psychiatric Association (APA) was late to conceptualise autism as they did not mention autism in the first two editions of their Diagnostic and Statistical Manual of Mental Disorders (DSM, 1952; 1968). The APA defined autism as a unique mental disorder under the “infantile autism” diagnostic category in DSM-III (APA, 1980) right after Rutter’s (1978) differentiation between autism and schizophrenia. In the diagnostic manual, infantile autism was described as: “a lack of responsiveness to other people, gross impairment in communicative skills, and bizarre responses to various aspects of the environment, all developing within the first 30 months of age ” (APA, 1980, p.87) which resembled Kanner’s (1943) definition of infantile autism. In the DSM-III, an argument was also made on the distinction between autism and schizophrenia suggesting that the two disorders are unrelated.

Later on, in 1987, the APA published a revised version of DSM (DSM-III-R) in which they included a more comprehensive manifestation of autism under the diagnosis named “autistic disorder”. DSM-III-R introduced sixteen domains in which autism manifests itself as dysfunction that are nested within three major developmental areas: 1) social interaction and reciprocity, 2) communication, and 3) restricted and repetitive behaviours. To standardise the diagnostic process of autistic individuals, the DSM-III-R suggested that an autism diagnosis can be made if dysfunction is observed in at least six out of sixteen domains, and at least two from each overarching developmental area. The DSM-III-R also

required an early manifestation of symptoms (i.e., before 30 months of age) with the full manifestation of autistic features before the age of three years, resembling Kanner's (1943) diagnostic features.

In the fourth edition (1994) and its revised form (2000), for the first time, the APA characterised autism as a spectrum disorder and categorised it under pervasive developmental disorders (PDD). Although the word “spectrum” was not used in the definition of autistic disorder, the way the diagnostic criteria for autistic disorder included the severity of symptoms and mentioned the variations in the presentation of symptoms in each individual pointed towards a spectrum. For instance, autistic individuals who were on the high end of the spectrum were identified either as having Asperger's syndrome – a milder form of autism first coined by Hans Asperger (1944) – or pervasive developmental disorders not otherwise specified (PDD-NOS), while those on the low end of the spectrum were characterised with either autism, childhood disintegrative disorder (CDD), or Rett syndrome. The Rett syndrome was specifically used to define girls with severe autistic symptomology that is accompanied by physical and mental dysfunction.

In 2003, the biggest genome project in history, the Human Genome Project, failed to identify heritability in autism which was mainly attributed to the challenges in associating the genetic variants to the five different autistic diagnoses (Autistic Disorder, PDD-NOS, Asperger's, CDD, and RETT syndrome) used in the DSM-IV-TR. To overcome this, the APA revised the diagnostic criteria for autism in its latest edition (DSM-V, 2013) by suggesting an all-inclusive diagnosis – Autism Spectrum Disorder (ASD) – ranging from mild to severe functionality. In the DSM-V, ASD is classified as a neurodevelopmental disorder that “encompasses disorders previously referred to as early infantile autism, childhood autism, Kanner's autism, high-functioning autism, atypical autism, pervasive developmental disorder not otherwise specified, childhood disintegrative disorder, and

Asperger's disorder" (APA, 2013, p.50). Additionally, the RETT syndrome is now categorised as an intellectual disability instead of being part of the ASD continuum. Hence, the most up-to-date medical definition of autism, according to the APA (2013), is persistent difficulties in social communication and interaction (i.e., social-emotional reciprocity, non-verbal communication, forming and maintaining relationships) and showing restricted and repetitive behavioural patterns (i.e., restricted interests, repetitive behaviours, resistance to changes and insistence on sameness, and hyper- or hypo-reactivity to sensory input). The medical definitive history of autism, from its first occurrence (Bleuler, 1911) to the most up-to-date concept (APA, 2013) is illustrated in Figure 1.

*Social Model.* A contemporary model, the social model of disability, emerged in the 1970s to challenge the idea that the disability is located within the individual (medical model) and that society should invest in curing the impairments of those individuals and bring them as close as possible to the non-impaired individuals. The model was proposed by disabled people themselves as a response to the systemic discrimination in society due to the longstanding values of the traditional medical model. Investigation of private files in public records (Baldwinson, 2019) has revealed the fact that the social model of disability first appeared in the Physically Impaired Against Segregation (UPIAS) report in the early 1970s in the UK. This report argued, for the first time, that disability arises from the barriers created by society and is not nested within an individual. More specifically, the social model suggested that people with impairments are not disabled themselves, they are disabled because of society's unrealistic expectations and unwillingness to accommodate their needs.

The scientific conceptualisation of the term "social model of disability" was first made by a British social scientist Mike Oliver (1990) who was a physically impaired person and disability rights activist. To Oliver, the unhuman language used by the medical model of disability and its sole focus on individual-level conceptualisation rather than societal

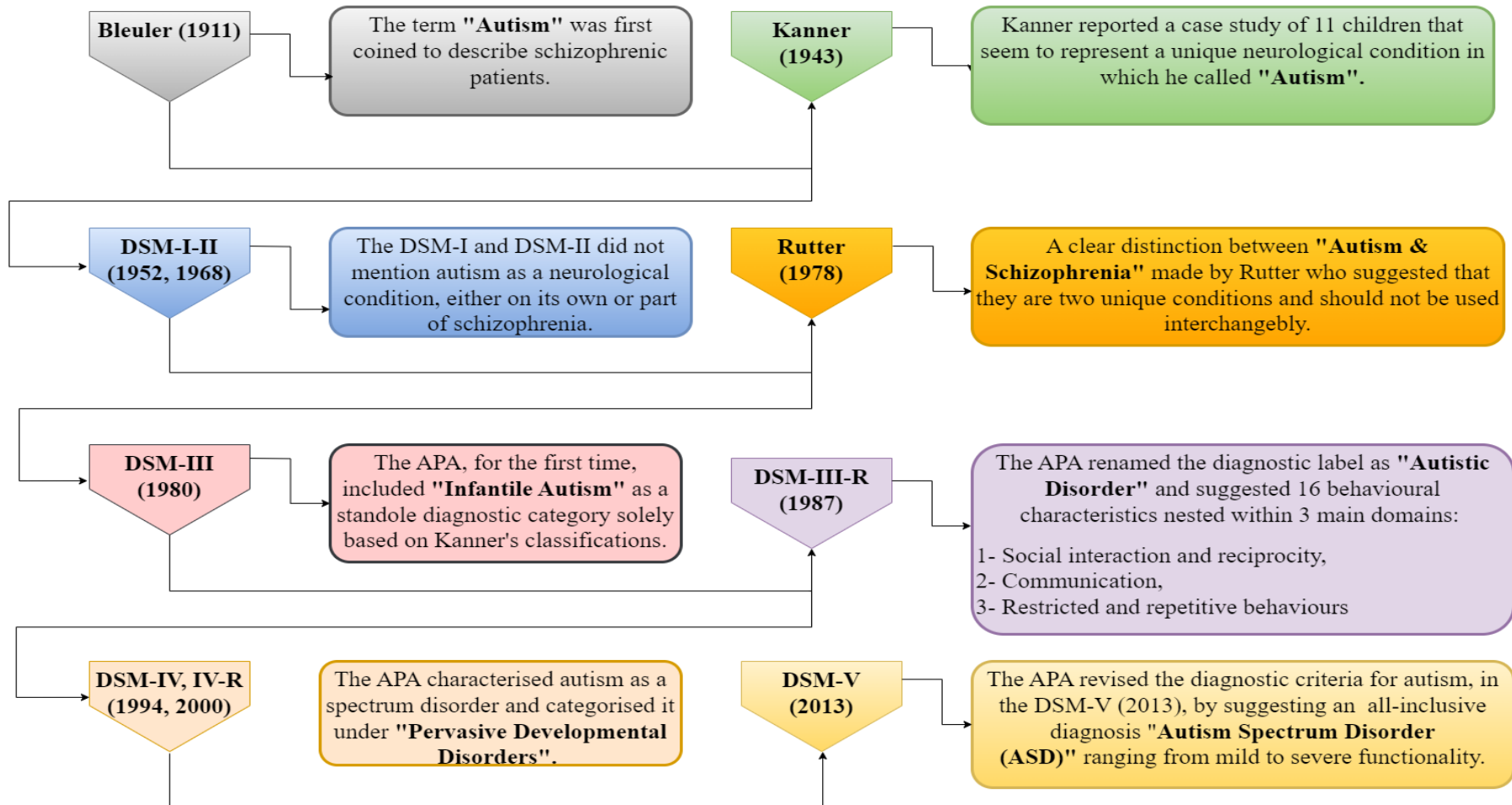
conceptualisation of disability caused great discrimination in society. Therefore, Oliver argued that there was an immediate need for a re-conceptualisation of disability and that society should not focus on the impairments of those individuals but, instead, try to adapt itself to meet their needs. Oliver stated that the narrow focus on the individuals' impairment was the fundamental issue underlying societies' failure in social inclusion. The social model of disability is a paradigm that refuses the individual deficit model (medical) and suggests that the underlying reasons why disabled people are not able to perform certain tasks as non-disabled people are located within society (e.g., poorly designed infrastructure) not due to individuals' impairments. Since its emergence, the social model of disability has received a high volume of attention and popularity and has led to significant changes in today's society.

One particular area that the social model of disability had its highest impact on was the language used to describe disabled people. Before the social model of disability, the language used to describe disability was extremely medicalised, less humanised, highly discriminatory, and somewhat hurtful. For instance, children with learning disabilities were called "handicapped", or "mentally retarded", which basically focused on individuals' deficits and somewhat encouraged discrimination. With the social model of disability, a more humane, inclusive, and person-centred language has been used to describe disability such as children with learning difficulties instead of handicapped children. The social model of disability has also promoted changes in laws, societal values, and nationwide policy revisions. In the late 20<sup>th</sup> century and early 21<sup>st</sup> century, the social model of disability received its highest popularity and has become the most dominant identity for disabled people (Stein & Stein, 2006).

The social model of disability has also received many critiques over its disregard for the need for medical approaches and treatments to improve the quality of life of disabled

**Figure 1 (2.1)**

*A Timeline of the Medical Definitive History of Autism*





people. Critiques have come from both disabled people and others (e.g., scientists, and professionals) who defend the necessity of the medical model and the need for medical treatment, especially for individuals with profound disabilities. For instance, there have been some critiques suggesting that the changes in societal structures and social environments can not be successful without a specific focus on individual deficits (Haegele & Hodge, 2016). Similarly, Shakespeare (2006) indicated that the strong focus on the environment in the social model of disability neglects individuals' impairments and, thus, fails to acknowledge the link between individuals' impairments and their social environment. Moreover, some have argued that even if society fully adapts to meet the needs of all impaired individuals, this may bring new forms of hidden social exclusions, such as a previously recommended model of creating a village for wheelchair users (Finkelstein, 1988).

*Author's Positionality.* The medical and social models of disability are two distinct concepts that seem to be at two far edges of a continuum in how to conceptualise disability. While the medical model locates disabilities within individuals, the social model argues that disabilities arise from society. In the medical model of disability, doctors and medical professionals are given the full responsibility of contributing to the lives of disabled people (e.g., identification, treatment, care). The social model of disability, however, rejects the need for a medical diagnosis and treatment and gives the responsibility to all stakeholders of society to accommodate the needs of the disabled community. While the social model is well suited to meeting the needs of high-functioning people with disabilities, their neglect of the need for treatment, therapy and other medical approaches to improve the lives of people with profound disabilities has so far unmet the needs of these individuals. On the contrary, the aims of the medical model seem to fit well to the needs of individuals with profound disabilities, while it is disregarded by those high-functioning individuals who can function well without any need for medical input or treatment. I, as the author of this thesis,

acknowledge the growing importance and popularity of the social model of disability knowing that it potentially represents the view of many, if not the majority, in the autistic community. However, I am also aware of the necessity of the medical model, especially for individuals with profound disabilities, whose developmental needs and quality of life can be improved with medical approaches and treatments. Therefore, I position myself in the middle of the continuum where the medical and social models of disability represent two extremes. Aligning with the social model of disability, I use inclusive and condition-first language, i.e., autistic individuals, when referring to those individuals as per the preferences of the autistic community. Following the medical model, I report the prevalence estimates and behavioural and emotional characteristics of autistic individuals according to medical diagnostic criteria and medical approaches.

### ***2.1.2 Prevalence of Autism***

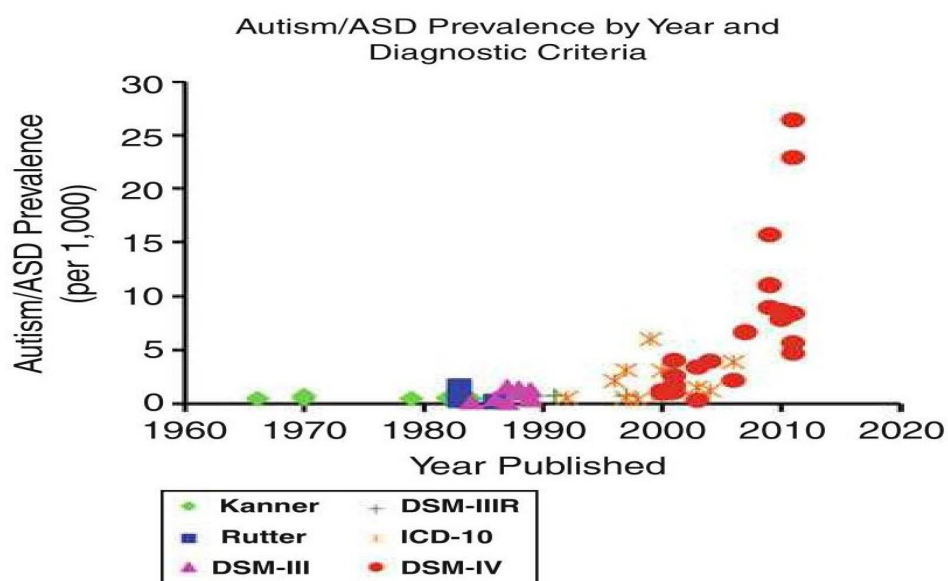
The prevalence of autism has shown a growing tendency since the onset of its first conceptualisation. The very first prevalence estimates of autism, dating to the 1960s and 1970s, indicate a prevalence of two to four cases per 10,000 individuals in Europe and the United States (Lotter, 1966; Treffert, 1970). With the current definition of autism in the DSM-V (APA, 2013), a recent report from the United Kingdom indicates that more than 1 in 50 children were diagnosed with autism as of 2020 (McConkey, 2020). Similar reports come from other countries. For example, the Centre for Disease Control and Prevention (2023) has indicated that 1 in 36 children are currently diagnosed with autism in the United States rising from 1 in 150 since 2000. Historical changes in the prevalence of autism, since its first conceptualisation to the latest definition, are shown in Figure 2.

There have been various debates over the potential triggering factors of the prevalence of autism which has increased sharply over the past couple of decades. One of these was Kanner's (1943) theory of *refrigerator mothers* in which he argued that severe social

communication and behavioural difficulties associated with autism may be caused by cold, emotionally detached, and unaffectionate mothers. This argument was repeatedly refused by researchers until it was completely abandoned by the scientific community (Cook & Willmerdinger, 2015; Davidson, 2022). Additionally, although some links between Vitamin D deficiency and intensive early screen exposure and autism have been found (Cannell, 2008; Dong et al., 2021; Kushima et al., 2022), no cause-effect association has yet been concluded. Taking it to a more extreme level, a scientific paper, in *The Lancet*, suggested that exposure to measles, mumps, and rubella (MMR) vaccine may be related to the increased rates of autism in children (Wakefield, 1998). This scientific paper was later retracted by the journal and all findings and conclusions were widely discredited by the extended scientific community across the globe. Hence, none of the above-mentioned reasons were proven to be a cause of autism or a potential reason for the spike in its recent rates. Lately, recent population-based cohort studies suggested, and this is widely accepted by the scientific community, that the rise in the rates of autism may be particularly related to the improvement in the diagnostic criteria and the diagnosis procedures (Hansen et al., 2015).

**Figure 2 (2.2)**

*The Prevalence of Autism Over The Past Five Decades (Rice, 2013, p.3121)*



Autism has been repeatedly reported to be more common in boys than girls. Previous reports have indicated that males are about four times more likely to be diagnosed with autism than females (Baron-Cohen, 2012; Charman, 2011, Landa, 2008). Even the latest figures, with the skyrocketing rates of autism, have shown this to be the case (Centre for Disease Control and Prevention, 2023). Based on these sex differences in prevalence rates, taking the cognitive and behavioural characteristics of autistic individuals into account, Baron-Cohen (2002) proposed the extreme male brain theory suggesting that autistic individuals may show an extreme version of the male brain which advances in systemising but shows considerable difficulties in empathising and vice versa for the female brain. However, this theory has recently been challenged by a recent controversy indicating that girls may be underrepresented in autism research and may be underdiagnosed due to their tendency to mask and camouflage their autistic traits (Corcadden & Casserly, 2021; Gould, 2017; Sedgewick et al., 2021). Some researchers have also argued that this may be due to the low sensitivity and validity of the current autism observation scales (e.g., autism diagnostic observation schedule) in measuring autism as they were primarily designed by taking into account autistic male characteristics and male-type restricted repetitive behaviours (Duvekot et al., 2017). Hence, the idea of whether the autistic brain represents the extreme male brain characteristics and whether girls are four times less likely to have autism than boys has so far remained a controversial topic of interest in the field.

### ***2.1.3 Social, Behavioural and Emotional Characteristics of Autistic Children***

***Social and Behavioural Characteristics.*** In the current definition of autism, in DSM-V (APA, 2013) autism is defined as a neurodevelopmental disorder characterised by persistent deficits in social communication and social interaction across three main contexts: 1) social-emotional reciprocity, 2) nonverbal communicative behaviours, and 3) developing or forming relationships. However, the social behavioural characteristics of autistic children

are not limited to such diagnostic criteria. For instance, some researchers have found that autistic children show increased rates of aggression, coercive behaviours, and temper tantrums compared to their non-autistic peers (Farmer & Aman, 2011; Hill et al., 2014). Additionally, difficulties in the theory of mind and executive function skills severely limit such individuals' perspective-taking, empathy, and emotional and behavioural regulation skills, which then leads to social dysfunction (de Bruin et al., 2007; Gilotty et al., 2002; Kimhi, 2014; Leung et al., 2016; Mazza et al., 2017; Torske et al., 2018). Supporting this, a population health-based report from the United States has also indicated that autistic children, aged four to seventeen, show substantially lower social functioning than their non-autistic peers (Centers for Disease Control and Prevention, 2006). Furthermore, autistic children may show a desire for loneliness (Bleuler, 1911; Kanner, 1943), social avoidance (Matson et al., 2009; Richer, 1976), and difficulties in forming relationships and friendships (APA, 2013; Calder et al., 2013; Petrina et al., 2014). It may also depend on with whom they desire to form friendships with. For instance, based on the homophily theory, researchers have argued that autistic children show a higher desire to form friendships with other autistic children than non-autistic children (Hoffmann et al., 2021). Hence, autism is accompanied by a wide variety of social behavioural difficulties, but the extent to which each difficulty occurs in a child will depend on where the individual is on the autism spectrum.

*Emotional Characteristics.* Autistic individuals also differ from their non-autistic peers in terms of their psychopathological characteristics. For instance, autistic children are more likely to show higher emotional distress, conduct problems, peer problems, and hyperactivity/inattention compared to their non-autistic peers with the most noticeable differences appearing in peer problems and hyperactivity/inattention domains (Centers for Disease Control and Prevention, 2006). There are also psychiatric comorbidities accompanying autism. For instance, previous research has shown that autistic individuals are

more likely to have major depression disorder, separation anxiety, generalised anxiety, agoraphobia, social phobia, and obsessive-compulsive disorder than non-autistic children (de Bruin et al., 2007; Ghaziuddin et al., 2002; Joshi et al., 2010, 2013; Muris et al., 1998). The researchers have estimated that around 14-30% of autistic children show major depressive problems while 84% have severe anxiety symptoms (Joshi et al., 2010; Leyfer et al., 2006; Muris, et al., 1998). The very high prevalence of severe anxiety symptoms in autistic children made many researchers consider it as a characteristic of autism instead of a comorbidity (Leyfer et al., 2006). Hence, autistic children show a wide range of severe psychopathological conditions some of which are thought to be more than comorbidity, and may even be an aspect of autism, due to their very high prevalence.

## **2.2 Sibling Relationships**

### ***2.2.1 The Sibling Bond***

The answer to the question *who is a sibling?* slightly varies across Western and non-Western cultures. In Western societies, in general, siblings are commonly defined based on biological, genealogical, or legal markers (i.e., full, half, step, adoptive, foster), while non-Western cultures are inclined to describe siblings by extended societal values and kinship (Cicirelli, 1995). Looking into Western definitions, full- and half-siblings are those who share two or one biological parent/s, respectively; step-siblings are those who do not share a biological parent but are joined by one of their parent's marriage, and adoptive/foster siblings are those who, one or both, are raised by parents with whom they have no biological or otherwise-formed relations with (Cicirelli, 2013). In non-Western cultures, blood or marriage-related ties are not the sole indicators of the concept of "sibling" as those with strong emotional bonds, e.g., cousins, are often conceptualised as siblings (Adams, 1999). However, cultural globalisation and changes in cultural identities in today's world (Vorhölter,

2012), create a trend towards a unipolar, i.e., Westernised, conceptualisation of the term “sibling” across the globe.

About eight in 10 children grow up with at least one sibling (Tippett & Wolke, 2015; US Census Bureau, 2023). This is the case in both Western and non-Western cultures, though in general, non-Western families are larger – formed by more children – than Western families (OECD, 2023). Not only do most children grow up with a sibling, but they also share about 50% DNA (Visscher et al., 2006) and spend about half of their time together until they reach adolescence (Dunifon et al., 2017). Such shared experiences make the sibling bond the strongest and the longest-lasting bond (Cicirelli, 2013). On this, McHale said: “Siblings are most people’s longest-lasting relationships—from early in childhood through old age. This means they can understand you in ways other people can’t”. (Weir, 2023, para. 1). In her book, *Mansfield Park*, Jane Austen also wrote about the strength of the sibling bond:

Children of the same family, the same blood, with the same first associations and habits, have some means of enjoyment in their power, which no subsequent connections can supply; and it must be by a long and unnatural estrangement, by a divorce which no subsequent connection can justify, if such precious remains of the earliest attachments are ever entirely outlived. (1817, p.247).

### ***2.2.2 The Double-Edged Characteristics of Sibling Relationships***

Even though siblings are strongly bonded to one another, their relationships are formed by both positive and negative interactions (Campione-Barr & Killoren, 2019). Researchers have suggested that sibling relationships are ambivalent, while there is intense love, there is also intense hatred (Wolke & Skew, 2012). On this, McHale said, “We often find that siblings who have intense conflict are also intensely loyal and loving to one another” (Weir, 2023, para. 4). Perhaps, this could relate to the fact that increased sibling interest and closeness increase the time siblings spend together (Stoneman, 2001) and, in turn, increased

time spent together increases the likelihood of negative sibling interactions, such as sibling conflict, in such families (Toseeb, 2022). Therefore, even though siblings are strongly bonded to one another, this bond is woven with positive and negative emotions and interactions.

The double-edged characteristics of sibling relationships collectively shape the social, emotional, and behavioural adjustment of siblings, for better and for worse (Buist et al., 2013; Campione-Barr & Killoren, 2019; Kramer & Conger, 2009; McHale et al., 2012; Sanders, 2017; Wolke & Skew, 2012). On the positive side, for instance, closeness and intimacy between siblings have been found to improve various developmental skills of children such as social<sup>1</sup>, communication<sup>2</sup>, and cognitive skills<sup>3</sup> and behavioural and emotional adjustment<sup>4</sup> (Abramovitch et al., 1979; Azmitia & Hesser, 1993; Boer et al., 2013; Gass et al., 2007; Stormshak et al., 1996; Yeh & Lempers, 2004). Likewise, certain forms of negative sibling interactions, such as sibling conflict, jealousy, and rivalry, have also been found to contribute to certain developmental skills<sup>5</sup> of children (Bedford et al., 2000; Brody, 2004; Brown & Dunn, 1996). However, it is important to note that persistent and frequent negative sibling interactions, such as conflict, are likely to turn into a harmful form of sibling interaction, such as sibling bullying (Wolke & Skew, 2012), which has adverse impacts on the developmental course of children and adolescents (Dantchev et al., 2018, 2019; Foody et al., 2020; Menesini et al., 2010; Plamondon et al., 2021).

## **2.3 Sibling Bullying**

### ***2.3.1 Definition and Conceptualisation***

Sibling bullying remained a neglected topic of interest in the literature until the past decade (Brett et al., 2023) for many reasons one of which is the lack of a commonly accepted

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<sup>1</sup> e.g., sharing, caring, nurturance, prosociality.

<sup>2</sup> e.g., verbal ability, active listening, turn taking.

<sup>3</sup> e.g., imitation, play skills, perspective taking.

<sup>4</sup> e.g., empathy, emotional regulation, self-esteem, sense of belonging.

<sup>5</sup> e.g., conflict resolution skills, perspective-taking and empathy, development of self, and identity formation.



definition and conceptualisation of this phenomenon (Chandran et al., 2019; Dantchev & Zemp, 2022; Wolke et al., 2015). More specifically, previous researchers have used the terms *aggression, violence, abuse, conflict, and bullying* interchangeably when describing negative sibling interactions (e.g., Coyle et al., 2017; Duncan, 1999; Eriksen & Jensen, 2006; Morrill et al., 2018). This is problematic as it, inevitably, resulted in inconsistency between previous prevalence estimates of sibling bullying and under-reporting of the scale of the problem (Coyle et al., 2017; Hoetger et al., 2015). It has also, potentially, delayed the acknowledgement of sibling bullying as an adverse form of sibling experience (Brett et al., 2023). To overcome this inconsistency in its conceptualisation and improve standardised measurement practices, Wolke and colleagues have provided a clear definition of sibling bullying:

Any unwanted aggressive behaviour(s) by a sibling that involves an observed or perceived power imbalance and is repeated multiple times or is highly likely to be repeated; bullying may inflict harm or distress on the targeted sibling including physical, psychological, or social harm. It encompasses two modes of bullying (direct and indirect) as well as four types of bullying (physical, verbal, relational, and damage to property). (2015, p.918).

Sibling bullying can take two forms: direct and indirect (Wolke et al., 2015). Direct forms of sibling bullying aim for immediate harm which includes hurting a sibling physically (e.g., hitting, kicking, pushing) or verbally (e.g., calling nasty names) or damaging their belongings (e.g., stealing money, breaking toys). Indirect forms, however, aim for long-term harm through social ties (i.e., involvement of other people) which includes social (e.g., excluding from their friendship groups) and psychological (e.g., telling lies or spreading rumours about them to make others dislike them) actions. Previous research has shown gender differences in the forms of sibling bullying with boys being more likely to be involved

in direct-type of sibling bullying while girls are more likely to be involved in indirect types of sibling bullying (Björkqvist et al., 1992; Lagerspetz, 1988; Sutton et al., 1999). Some researchers have argued that indirect forms of sibling bullying, such as social exclusion, may have more adverse psychopathological outcomes than the direct type of sibling bullying (Thomas et al., 2016).

There are also different sibling bullying roles that individuals can take on, depending on whether they are the victim, the perpetrator, or both in bullying instances (Bouchard et al., 2019). The literature categorises those individuals under four different groups: 1) *uninvolved*, 2) *bully-only* (so-called pure bully), *victim-only* (so-called pure victim, passive victim), and *bully-victim* (so-called provocative/proactive victim) (Dantchev et al., 2018, 2019; Tanrikulu & Campbell, 2015; Toseeb et al., 2018, 2020a, 2020b, Toseeb & Wolke, 2022, Wolke & Samara, 2004; Wolke & Skew, 2012). In the existing literature, the commonly accepted cut-off value for bullying involvement is determined as *once a week* (Toseeb et al., 2018; 2020b; Wolke & Samara, 2004; Wolke & Skew, 2011; Wolke et al., 2015). Based on this, if a person is exposed to or perpetrates bullying actions less frequently than once a week (e.g., never, once or twice, once a month), they are considered uninvolved in bullying. Additionally, the bully-only group represent those who perpetrate bullying actions towards their sibling/s at least once a week but are not victimised by their sibling/s. In contrast, the victim-only group represents individuals who are victimised by their sibling/s at least once a week but do not perform such behaviours towards their sibling/s. Finally, bully-victims are those who are victimised by their sibling/s and bully them at least once a week.

### **2.3.2 Theoretical Background**

Various theoretical frameworks have so far been followed to reach a more holistic understanding of sibling bullying. These include but are not limited to the attachment theory, the coercion theory, the resource control theory, and the social learning theory (Dantchev &

Wolke, 2019; Plamondon et al., 2021; Wolke et al., 2015; Wolke & Skew, 2012). The current thesis, however, is guided by three specific theoretical frameworks namely the coercion theory, ecological systems theory, and resource control theory. The reason for this specific choice of theories is that they explain the occurrence of sibling bullying based on individual (i.e., aggressive behaviours – coercion theory), family (i.e., familial resources – resource control theory), and broader contextual factors (i.e., culture, ecological systems theory) which are within the main scope of this thesis. More specifically, the coercion theory guides the current thesis to better understand siblings' aggressive behaviours and the reinforcement of such behaviours within the family context such as ineffective parental response to sibling conflict and how they relate to the dynamics of sibling bullying. Additionally, from an evolutionary perspective, the resource control theory guides the current thesis for a better understanding of the link between limited family resources (e.g., poverty) and sibling bullying. Finally, the ecological systems theory guides the current thesis in terms of the differing dynamics of sibling bullying in a cross-cultural context. More information about these theoretical frameworks and their guidance in the current thesis is introduced below.

***Coercion Theory.*** The Coercion Theory (CT) suggests that children show coercive behaviours to gain or maintain power or control others within the family (Patterson et al., 1967). According to the CT, children learn such behaviours as a result of ineffective parental responses to their aggressive and hostile behaviours (Thomas, 2011). The existing literature provides compelling evidence in support of these arguments. For instance, previous research suggests that uninvolved parenting increases aggression and antisocial behaviours (Knutson, 2004; Luyckx et al., 2011). Additionally, ineffective parental intervention in sibling conflict and bullying has been shown to reinforce subsequent sibling conflict and bullying (Bouchard et al., 2019; Bouchard & Sonier, 2021; Cicirelli, 2013; Dantchev & Wolke, 2019; Felson & Russo, 1988; Relva et al., 2019; Tucker & Kazura, 2013; Updegraff et al., 2005).

The application of the CT is particularly relevant when researching sibling bullying in families where a child is autistic. This is because siblings in such families may get stuck in a coercive cycle due to a combination of increased conflictual situations and ineffective parenting (Lunkenheimer et al., 2016; Maljaars et al., 2014). More specifically, there are increased conflictual intra-family relationships in families where a child is autistic compared to non-autistic child families (Hartley et al., 2017; Papp & Hartley, 2019; Toseeb et al., 2018, 2020b). On top of this, there is also increased parental differential treatment and parental favouritism in families where a child is autistic, compared to non-autistic child families (Brody et al., 1992; McHale et al., 1986; McHale & Pawletko, 1992). Such a combination of increased conflictual situations and ineffective parenting may trap children in a coercive cycle in those families (Piro-Gambetti et al., 2023; Lin et al., 2023; Qing et al., 2022). Hence, increased coercive behaviours and ineffective parental responses to conflicted intra-family relationships are likely to create a coercive cycle meaning that such siblings are exposed to constant, persistent, and recurring aggressive behaviours.

***Resource-Control Theory.*** The Resource-Control Theory (RCT) suggests that children show coercive behaviours to secure or control desirable but scarce family (e.g., food, toys) or social (e.g., parental attention) resources, (Hawley, 1999). According to Hawley, coercive strategies involve accessing the desired resources through aggressive and manipulative behaviours (e.g., physical harm, social exclusion). Supporting these, some researchers have argued that the main motivation behind dominance-oriented coercive behaviours, such as bullying, is to gather or protect material and social resources such as parental time, affection, and favouritism (Farrell & Dane, 2020; Olthof et al., 2011; Reijntjes et al., 2013; Salmon & Hehman, 2014).

The RCT principles closely relate to sibling bullying and have commonly been tested by previous researchers (e.g., Dantchev & Wolke, 2019; Toseeb et al., 2020a; Toseeb &

Wolke, 2022; Qing et al., 2022). For instance, an increased number of siblings has been found as a risk factor for increased sibling bullying with researchers arguing that this is due to the increased competition over limited material or social familial resources (Bowes et al., 2014; Dantchev & Wolke, 2019b, Menesini et al., 2010; Toseeb et al., 2018; Toseeb & Wolke, 2022; Tucker et al., 2013). Further supporting the RCT principles, some researchers have argued that poverty and low- family income are precursors of sibling bullying (Eriksen & Jensen, 2006, 2009; Qing et al., 2022; Toseeb et al., 2018; Tippett & Wolke, 2015). Similarly, some previous researchers have suggested that high parental education is linked to increased risks of sibling bullying (Eriksen & Jensen, 2006; Tucker et al., 2013a, 2018), potentially due to increased employment rate and, thus, reduced parental supervision and attention (Benson & Mokhtari, 2011; Johnston & Swanson, 2006). Finally, existing evidence suggests that older siblings are more likely to be involved in sibling bullying compared to younger siblings (Bowes et al., 2014; Toseeb et al., 2018; Tippett & Wolke, 2015) arguing that this may be driven by eldest children's desire to control limited familial resources. Consequently, the RCT is a useful theoretical framework for identifying whether sibling bullying instances are related to siblings' efforts to control limited family resources.

Despite the existing evidence supporting the RCT's arguments, evidence conflicting with these arguments also exists in the literature. For instance, while some researchers have suggested that low familial resources, i.e., family income, increase the risk of sibling bullying, some have found no association between family income and sibling bullying (Hoffman et al., 2005). Similarly, some others reported that sibling bullying may be even more common in high-income families compared to families with low resources (Tippett & Wolke, 2015). Additionally, while some researchers have reported positive correlations between increased parental education and sibling bullying, this is also not universally supported as some others have found no correlation between parental education and sibling

bullying (Bowes et al., 2014; Eriksen & Jensen, 2009). Furthermore, while some researchers have suggested that an increased number of siblings is a risk factor for sibling bullying, others found either no link or negative associations between sibling bullying and the number of siblings (Hardy, 2001). Hence, the literature has remained inconsistent regarding whether or not the factors that relate to controlling familial resources, e.g., birth order, number of siblings, parental education and familial income, are risk factors for sibling bullying

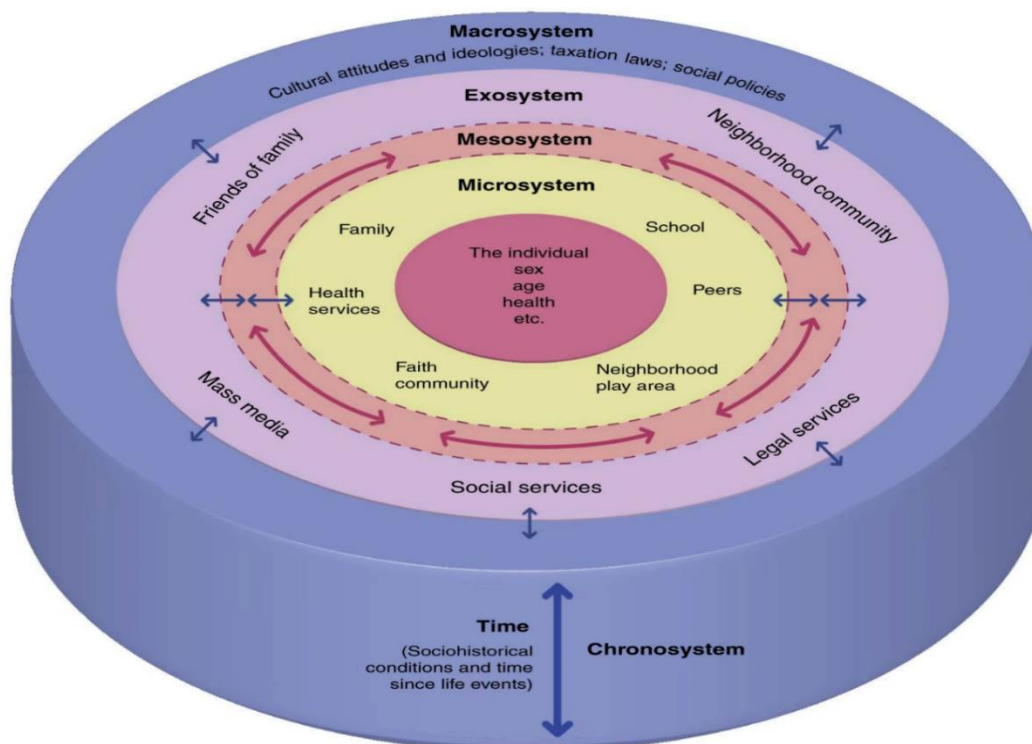
*Ecological Systems Theory.* In his field trips, Urie Bronfenbrenner, a cross-cultural psychologist, observed that human behaviours show drastic changes from one environment to another, within and between cultures, based on which he proposed the Ecological Systems Theory (EST, Bronfenbrenner, 1979). According to Bronfenbrenner, “The ecology of human development involves the scientific study of the progressive, mutual accommodation between an active and growing human being and the changing properties of the immediate settings in which the developing person lives, as this process is affected by relations between these settings, and by the larger contexts in which the settings are embedded” (1979, p.21). The EST takes its roots from Lewin’s (1935) dynamic theory of personality which suggests that human behaviours are products of an interaction between individuals and the environment they live in.

To unfold, the EST (Bronfenbrenner, 1979) proposes hierarchically nested six environments that collectively and dynamically shape individuals’ development and behaviour. The first level, *the individual level*, is formed by the personal characteristics of individuals such as ethnicity, age, sex, personality, social, behavioural, and emotional functioning, and mental health. The second level, *microsystem*, comprises an individual’s immediate environment in which they are in constant interaction such as the number of friends, parent-child relationships, parenting styles, and family characteristics and structures. The third level, *mesosystem*, comprises interactions between multiple systems, for instance,

home-peer interactions, parent-teacher interactions, and home-neighbourhood interactions. The fourth level, *exosystem*, consists of distal environmental dynamics that are not directly related to the child, but that events occurring in this particular environment indirectly affect the child's behaviour, such as school and neighbourhood characteristics. The fifth level, *macrosystem*, refers to individuals' broadest-level environment, such as culture, and their indirect influence on individuals' developmental outcomes. Finally, the sixth environment refers to the *chronosystem* level which comprises major life events during a lifetime such as the loss of a family member, or traumatic or historic events, e.g., war, epidemic, pandemic, etc. A graphical representation of these six environments is presented below, see Figure 3.

**Figure 3 (2.3)**

*Bronfenbrenner's Ecological Systems Theory (Lopez et al., 2021, p.367)*



The EST has been a useful theoretical approach for researchers to better understand the dynamics of sibling bullying. However, so far, the majority of previous research has commonly focused on the influences of immediate rather than distal environmental factors on

the dynamics of sibling bullying. For instance, taking the central component of the EST into account, i.e., individual characteristics, researchers have so far linked ethnicity, sex, birth order, number of siblings, siblings' sex composition, and age gap to sibling bullying (Bowes, 2014; Dantchev et al., 2018; Dantchev & Wolke, 2019; Menesini et al., 2010; Tippett & Wolke, 2015; Toseeb et al., 2018, 2020a; Tucker et al., 2013a, 2014a). Moving outwards from the individual characteristics, a wide range of microsystem environmental factors have been identified as risk factors for increased sibling bullying: family income, poverty, single-parent status, parental education, parenting styles, parental differential treatment, and inter-parental conflict (Dantchev & Wolke, 2019; Hartley et al., 2017; Papp & Hartley, 2019; Qing et al., 2022; Tippett & Wolke, 2015; Toseeb et al., 2018, 2020b; Tucker et al., 2014a, 2018; Wolke et al., 2015).

Moving towards the distal environments, i.e., mesosystem, researchers have found a strong relationship between sibling bullying and peer bullying suggesting that those who experience bullying at one place are more likely to experience bullying at the other place compared to those not involved (Duncan, 1999; Menesini et al., 2010; Wolke & Skew, 2012). To the best of my knowledge, to date, there is no evidence showing the influence of upper-level environments, i.e., exo-macro- and chrono-system levels, on the dynamics of sibling bullying. Hence, although the EST is a commonly applied theoretical framework in bullying research, more research is needed to shed light on the potential influences of broader-level environmental factors on the dynamics of sibling bullying.

### **2.3.3 Empirical Evidence**

***Prevalence of Sibling Bullying.*** Sibling bullying is the most common type of violence in the lives of children and adolescents. Previous research has shown that around one in two children and adolescents experience sibling bullying (Dantchev & Wolke, 2019; Tippett & Wolke, 2014; Toseeb et al., 2020; Tucker et al., 2013a). Though others have



reported lower (Liu et al., 2021; Peng et al., 2022; Qing et al., 2022) or higher rates ranging between 10-80% (Duncan, 1999; Skinner & Kowalski, 2013). This variation in the prevalence of sibling bullying is mainly due to the differences in the measurement and conceptualisation of bullying (Bjereld et al., 2020; Modecki et al., 2014; Wolke et al., 2015). Despite the variation in the reported prevalence of sibling bullying, its lower and upper range is still more common than other types of violence in children and adolescents' lives such as peer and cyberbullying (Juvonen & Graham, 2014; Modecki et al., 2014). That is, although the exact rates of sibling bullying are hard to estimate, it seems to be highly prevalent in children's and adolescents' lives.

Although sibling bullying is highly prevalent in both children's and adolescents' lives, it shows an increasing pattern from early childhood to late childhood before starting to decline from early adolescence onwards (Finkelhor et al., 2006; Toseeb et al., 2020b, Tucker et al., 2014b). This is perhaps related to the shift in children's developmental needs and interests. More specifically, with increased social communication and language skills as children grow up, they start to interact more with their siblings until they reach adolescence upon which their interest shifts from siblings to peers (Oliva & Arranz, 2005). This shows that increased sibling interaction and time spent together are linked to increased risks for sibling bullying involvement (Toseeb, 2022). Further supporting this, researchers have found declining patterns of sibling interest and increasing patterns of peer interest alongside declining sibling bullying and increasing peer bullying rates (Finkelhor et al., 2016, Tucker et al., 2014b). Therefore, it is seen that developmental needs play a role in the type of bullying that children are exposed to, and sibling interest, and therefore bullying, seem to decline with the transition from childhood to adolescence.

***Precursors of Sibling Bullying.*** Existing empirical findings have indicated a wide range of individual and family-level precursors of sibling bullying (Bowes, 2014; Dantchev

et al., 2018; Menesini et al., 2010; Tippett & Wolke, 2015; Toseeb et al., 2020a; Tucker et al., 2013a, 2014a), with individual-level precursors being stronger predictors than family-level factors (Dantchev & Wolke, 2019; Toseeb et al., 2020a). This aligns well with the EST (Bronfenbrenner; 1979) which suggests that individuals' behaviours are influenced by multiple layers of immediate and distal environments while emphasising significant direct effects of individuals' immediate environments. Based on the EST, one could expect broader-level environmental precursors of sibling bullying (i.e., culture). However, the existing literature presents no findings in this regard due to the lack of existing cross-cultural research on sibling bullying. Therefore, the investigation of sibling bullying in broader, i.e., cross-cultural, contexts is an urgent matter (Sabah et al., 2022).

Looking at individual-level precursors, sibling bullying is linked to a wide range of individual characteristics such as sex, ethnicity, birth order, number of siblings, siblings' sex composition, and siblings' age gap. More precisely, first-born children are more likely to be involved in sibling bullying potentially due to the increased feelings of jealousy with the birth of the second child and drastic loss of family resources, e.g., parental attention, material resources, upon the birth of the new sibling (Dantchev & Wolke, 2019; Toseeb et al., 2020a). Relatedly, an increased number of siblings increases the risk of sibling bullying potentially due to the increased competition over the limited familial resources (Hawley, 1999), increased time spent with siblings, and overcrowding (Dantchev & Wolke, 2019; Tippett & Wolke, 2015; Tucker et al., 2013a; Wolke & Skew, 2012). Additionally, being a male and having an older male sibling increases the risk of being involved in sibling bullying, with males often being the bully and females the victim of sibling bullying (Dantchev & Wolke, 2019; Dantchev et al., 2019; Duncan, 1999; Hoffman et al., 2005; Menesini et al., 2010; Qing et al., 2022; Wolke & Skew, 2012). Furthermore, having a sibling close in age is also a risk factor for increased sibling bullying perhaps due to the increased daily sibling interactions

and time spent together (Felson & Russo, 1988; Tucker et al., 2013a). Moreover, White individuals are more likely to bully a sibling and be victimised by a sibling than non-White individuals, though it is not yet clear how ethnicity plays a role in sibling bullying (Toseeb et al., 2020a; Tucker et al., 2013a). Finally, individuals with pre-existing mental health difficulties (Dantchev & Wolke, 2019; Katsantonis, 2022) and those with poor behavioural functioning (Toseeb et al., 2020a), e.g., prosociality and emotion regulation, are at increased risks for involvement in sibling bullying than others with no pre-existing mental health difficulties or behavioural dysfunction.

Although an abundance of evidence exists on the individual-level precursors of sibling bullying, the literature is somewhat inconsistent. For instance, contradicting the evidence suggesting males are more likely to be involved in sibling bullying than females, some studies have shown that females are either equally or more likely to be involved in sibling bullying than males (Button & Gealt, 2010; Duncan, 1999). Additionally, contradicting the evidence reporting that the increased number of siblings and having a sibling close in age as risk factors for sibling bullying, some others have found no correlation between the number of siblings or age gap and sibling bullying (Hardy, 2001; Hoffman et al., 2005; Laopratai et al., 2023; Qing et al., 2022). Furthermore, although pre-existing mental health difficulties are suggested to be risk factors for increased rates of sibling bullying, those individuals may perceive and report higher rates of bullying exposure than their actual bullying involvement rates (Bowes et al., 2014). Hence, although an abundance of research has shown individual-level risk factors of sibling bullying, more research is needed to clarify the contradicting evidence in the literature.

There are also family-level precursors of sibling bullying which can be categorised under three overarching domains: 1) family composition, 2) family socio-economic status, and 3) parenting characteristics. Regarding family composition, higher rates of sibling

bullying have been reported in single-parent (Qing et al., 2022) and overcrowded households (Makinde et al., 2016) compared to two-parent and less crowded households. Additionally, low parental education and low family income increase risks for sibling bullying (Chandran et al., 2019; Dantchev et al., 2018; Eriksen & Jensen, 2009; Qing et al., 2022; Wolke & Skew, 2012; Tippett & Wolke, 2015) potentially due to the increased competition over the limited family resources (Hawley, 1999). In regard to parenting characteristics, harsh or punitive parenting style (Eriksen & Jensen, 2006; Toseeb et al., 2020a), parent-to-child violence (Eriksen & Jensen, 2006; Heinrich, 2017; Qing et al., 2022), interparental conflict (Dantchev & Wolke, 2019; Heinrich, 2017; Hoffman et al., 2005; Qing et al., 2022), parental rejection of the child (Sabah et al., 2022), and parental differential treatment (Brody et al., 1992; McHale et al., 1986) and maltreatment (Radford et al., 2013) are significant precursors of sibling bullying. Finally, ineffective parental intervention in sibling conflict and bullying increases the repetition of such actions in the future (Cicirelli, 2013; Felson & Russo, 1988; Relva et al., 2019; Tucker & Kazura, 2013).

Again, although ample evidence has shown family-level precursors of sibling bullying, the literature contains somewhat contradicting evidence. For instance, some researchers have found no correlations between parental marital status, i.e., single-parent households, and sibling bullying involvement (Hardy, 2001; Tippett & Wolke, 2015; Toseeb et al., 2020a; Tucker et al., 2014a). Additionally, while the majority of evidence suggests that low parental education is a risk factor for increased sibling bullying, some others reported otherwise suggesting high parental education increases the risk of sibling bullying arguing that this may be related to a lack of resources, perhaps parental attention, supervision, etc, and lesser family stability (Tippett & Wolke, 2014; Tucker et al., 2014a). Finally, not aligning with the theoretical assumptions (i.e., resource control theory) and empirical findings on family income and sibling bullying, some researchers either found no correlations between

sibling bullying and family income (Toseeb et al., 2020a) or positive correlations suggesting higher rates of sibling bullying in higher income families than low-income families (Tippett & Wolke, 2015). Finally, despite the growing evidence, Wolke et al., (2015) argued that sibling bullying may not be linked to family-level socio-demographics, such as parental education, and single-parent status, but may relate to parenting characteristics. These contradictions warrant more research to shed light on the family-level precursors of sibling bullying.

*Outcomes of Sibling Bullying.* Given its high prevalence, one could expect sibling bullying to be associated with a wide range of developmental outcomes. Although negative sibling interactions, i.e., conflict, could contribute to the quality of sibling relationships and favour certain developmental outcomes of children (Campione-Barr & Killoren, 2019), sibling bullying is reported as a harmful form of sibling interaction that leads to deteriorated developmental outcomes (Hoetger et al., 2015; Wolke et al., 2015). Given that the literature is severely limited on sibling bullying, there is little knowledge about its influence on different developmental outcomes. Though, the limited evidence points towards three major developmental outcomes of sibling bullying: 1) behavioural and emotional dysfunction, 2) psychopathological difficulties, and 3) peer problems.

To begin with, in terms of social, behavioural, and emotional dysfunction, increased rates of sibling bullying are associated with reduced social skills (e.g., prosociality, empathy, friendship, and number of friends) (Menesini et al., 2010; Toseeb et al., 2018, 2020a, 2020b; McCoy et al., 1994). Additionally, involvement in sibling bullying, as either the bully or victim, is associated with reduced emotional and self-regulation (Toseeb et al., 2020a; Fite et al., 2022; Foody et al., 2020). Moreover, previous research has shown that increased sibling bullying rates decrease the level of self-esteem later in life (Plamondon et al., 2021; Skinner & Kowalski, 2013; Toseeb & Wolke, 2022) while high self-esteem served as a protective

factor against sibling bullying involvement (Dantchev & Wolke, 2019). These authors have also found that individuals who are involved in sibling bullying are more likely to show higher rates of antisocial (e.g., crime) and high-risk (i.e., alcohol use, nicotine dependency, illicit drug use) behaviours compared to those who are not involved in sibling bullying. Consequently, sibling bullying involvement is associated with increased risks for social, behavioural, and emotional dysfunction.

In terms of its link with psychopathological difficulties, increased rates of sibling bullying are linked to a wide range of psychopathological outcomes. For instance, regarding negative mental health outcomes, researchers have shown that sibling bullying is associated with increased anxiety and depression (Bowes et al., 2014; Dantchev et al., 2019; Duncan, 1999; Laopratai et al., 2023; Liu et al., 2020), loneliness (Duncan, 1999), internalising and externalising problems (Coyle et al., 2017; Plamondon et al., 2021; Toseeb & Wolke, 2022; Wolke & Samara, 2004; Wolke & Skew, 2011), psychological distress (Toseeb & Wolke, 2022; Tucker et al., 2013b), suicidal ideation and self-harm (Bowes et al., 2014, Dantchev et al., 2019; Toseeb & Wolke, 2022), and psychotic (Dantchev et al., 2018; Liu et al., 2021) and traumatic symptoms (Radford et al., 2013). In terms of positive mental health, increased rates of sibling bullying are correlated with poorer self-esteem (Katsantonis, 2022; Toseeb & Wolke, 2022) and wellbeing (Duncan, 1999; Plamondon et al., 2021; Toseeb & Wolke, 2022; Truong et al., 2022). Although sibling bullying appears to be correlated with a wide range of psychopathological difficulties, the nature of these associations has remained unknown.

Given that there is growing literature suggesting a link between sibling bullying and psychopathological difficulties, it is particularly important to understand the nature of this association, whether it is direct or indirect. Although mediation analyses (i.e., causal statistical models for indirect associations) have previously been performed on sibling bullying, they all included sibling bullying as the mediator variable instead of the predictor of

psychopathological difficulties (e.g., Bouchard et al., 2019; Katsantonis, 2022; Menesini et al., 2010; Plamondon et al., 2021). Looking more closely at the literature, precisely, prosociality, emotion regulation, and self-esteem strike as potential mediators between sibling bullying and psychopathological difficulties due to their significant correlations with sibling bullying (Fite et al., 2022; Foody et al., 2020; Menesini et al., 2010; Plamondon et al., 2021; Skinner & Kowalski, 2013; Toseeb et al., 2018, 2020a, 2020b; Toseeb & Wolke, 2022) and psychopathological outcomes (Chervonsky & Hunt, 2019; Corden et al., 2021; Mazurek, 2014; McCauley et al., 2019; Moksnes & Reidunsdatter, 2019; van der Crujisen & Boyer, 2021). Taking from there, a recent study that tested the indirect links between sibling victimisation and internalising symptoms has found indirect effects of sibling victimisation on internalising problems through emotion dysregulation (Fite et al., 2022). These recent findings strengthen the argument that, instead of a direct link, the associations between sibling bullying and psychopathological difficulties may be indirect in nature.

Not only does sibling bullying negatively impact developmental outcomes, but it also shows a negative spillover impact on pupils' peer relationships. Previous research has argued that bullying starts at home (Wolke & Skew, 2012). Taken from here, and based on the social learning theory (SLT), others have argued that individuals who are victimised at home are more likely to be victimised by their friends at school and those who bully a sibling at home are more likely to bully a peer at school compared to those who are not involved in sibling bullying (Duncan, 1999; Foody et al., 2020; Menesini et al., 2010; Tippett & Wolke, 2015; Truong et al., 2022; Tucker et al., 2014b; Wolke & Samara, 2004). Such triggering impacts of sibling bullying on peer bullying are likely to reduce the number of friends and friendship quality (McCoy et al., 1994). This may also explain the reason why individuals who are involved in sibling bullying show increased levels of loneliness (Duncan, 1999).

## 2.4 Autism and Sibling Bullying

### 2.4.1 Theoretical Explanation

Although a theoretical framework linking sibling bullying and autism has not yet been established. There are, however, three commonly applied theoretical frameworks in explaining the behavioural characteristics of autistic children: 1) Theory of Mind, 2) Executive Function theory, and 3) Double Empathy Problem. These theoretical frameworks mainly base their roots on individuals' social, cognitive, and behavioural functioning, such as the ability to take others' perspectives, emotional and behavioural regulation, and empathy (Lantrip et al., 2016; Milton, 2012; Wimmer & Perner, 1983). Additionally, EF or ToM have often been researched together due to their high inter-relations (Kouklari et al., 2019; Kramer & Stephens, 2014). Based on this, I argue that an improved understanding of these theoretical frameworks may help to better understand the dynamics of sibling bullying in families where a child is autistic.

**Theory of Mind.** The Theory of Mind (ToM) was first introduced by Premack and Woodruff (1978) as individuals' ability to imagine mental states of self and others. Following this, Wimmer and Perner (1983) developed the wrong belief test with which they found that children start to develop ToM skills as early as three years of age. Based on Wimmer and Perner's (1983) early findings, Baron-Cohen et al. (1985) hypothesised that autistic children would perform poorly in ToM tests and would be unable to predict others' beliefs and behaviours. Confirming this, in their multigroup experimental study, autistic subjects failed to take others' perspectives, even though their mean age was higher than non-autistic subjects. This early study was later replicated many times with researchers repeatedly suggesting that autistic children show ToM deficits, independent of their intellectual level (Baron-Cohen, 2000; Frith & Happé, 1994; Schneider et al., 2013).



Both poor and advanced ToM skills have been shown to be linked to an increased likelihood of being involved in sibling bullying as either the victim or the bully, respectively (Cook et al., 2010; Shakoor et al., 2012). More specifically, poor ToM skills are linked to a high likelihood of being a victim of bullying while bullies have been found to have high ToM skills (Smith, 2004; Sutton et al., 1999; Van Roekel et al., 2010). Further supporting this, a study has suggested that girls show better ToM skills than boys which makes them superior social bullies (indirect bullying) than boys (Rivers & Smith, 1994). Indirect correlations between ToM skills and bullying involvement could also be established as ToM skills relate to reduced social functioning (Randall, 1997; Repacholi et al., 2003) and high-risk behaviours (Sanvicente-Vieira et al., 2017) which are associated with increased sibling bullying (Dantchev & Wolke, 2019; Toseeb et al., 2018, 2020a). Given autistic children's deficits in ToM skills and the fact that their non-autistic siblings are likely to have superior ToM skills, autistic children may be more likely to be victimised by their siblings than bullying them. Finally, deficits in ToM skills also indicate that autistic children may not be aware of the negative consequences of their harmful behaviours (Bauminger, 2002) which may increase their likelihood of becoming the bully.

***Executive Function.*** The Executive Function (EF) theory was first conceptualised by Pribram (1973) who conducted some of the earliest studies investigating the role of the prefrontal cortex on individuals' behavioural functioning. Since then, researchers have put a great effort into exploring skills that are related to the prefrontal cortex, i.e., EF skills, which has so far indicated 30 different skill sets that relate to EF (Baggetta & Alexander, 2016). The varying range of EF skills has been found to relate to three core developmental domains: 1) inhibition, 2) working memory, and 3) sustained and selective attention (Alvarez & Emory, 2006; Barkley, 1996; Burgess et al., 1998; Pennington et al., 1996; Welsh, 2002). Additionally, EF skills have also been found to be comorbid with ToM skills (Ozonoff et al., 1991; Roca,

2016; Scott & Schoenberg, 2011; Szatmari et al., 1990). That is, deficits in either EF or ToM skills are likely to manifest as deficits in the other one. Additionally, like deficits in ToM skills, executive function deficits have also been found to be comorbid with autism (Prior & Hoffmann, 1990; Rumsey, 1985; Szatmari et al., 1990). A recent study has even conceptualised EF deficits as an endophenotype of autism (Demetriou et al., 2019). Hence, EF skills, together with ToM skills, are prefrontal cortex-related skills that are comorbid with autism.

Poorer EF skills are linked to increased risks of being involved in bullying which indicates that autistic individuals may be at heightened risk for being involved in bullying than non-autistic individuals. More specifically, Coolidge et al. (2004) have found EF deficits to predict bullying behaviours indicating that individuals with EF deficits are more likely to become bullies than those with high EF skills. Adding to this, high negative correlations have been found between EF skills and victimisation suggesting that those with EF deficits may be more prone to victimisation than those with high EF skills (Jenkins et al., 2018). Supporting both previous findings, Liu et al. (2017) have found that high EF skills protect against being victims of perpetrators of bullying. Furthermore, others have also shown that both bullies and victims show deficits in EF with victims showing extreme difficulties in EF tasks (Medeiros et al., 2016). There may also be indirect correlations between EF and bullying involvement. For instance, deficits in EF result in emotional dysregulation (Lantrip et al., 2016; Sira & Mateer, 2014; Sudikoff et al., 2015; Ursache et al., 2013) which is also closely linked to increased sibling bullying involvement (Toseeb et al., 2020a; Fite et al., 2022; Foody et al., 2020). Considering the fact that EF deficits are comorbid with autism, autistic children may be at an increased risk for being involved in sibling bullying compared to non-autistic children.

***Double Empathy Problem.*** Until recently, researchers had repeatedly portrayed autistic children as lacking empathy or less empathic than their non-autistic peers (Yirmiya et al., 1992; Peterson, 2014). However, a new theoretical framework, The Double Empathy Problem (DEP),

suggests that the failure to take another's perspective, i.e., empathy, in social contexts, is reciprocal between autistic and non-autistic individuals (Milton, 2012). Given that reduced levels of empathy are linked to increased levels of bullying involvement (Chan & Wong, 2015; Walters & Espelage, 2018), a double empathy problem, i.e., between autistic and non-autistic individuals may heighten the risks for bullying involvement between autistic and non-autistic individuals. Supporting this, researchers have found a higher likelihood of bullying experiences for autistic children who attend a mainstream school compared to those who attend a special school (Humphrey & Hebron, 2015; Rowley et al., 2012). Based on these suggestions and given that lower rates of empathy are also linked to increased risks for sibling bullying involvement (Kandemir Özdiñ, 2019; Menesini et al., 2010), it could be argued that families formed by autistic and non-autistic siblings may be at higher risks for sibling bullying than families with otherwise-formed sibling pairs due to the double empathy problem between siblings.

#### ***2.4.2 Empirical Findings***

The limited evidence suggests that autistic individuals are more likely to engage in sibling bullying, both as victims and bullies, than their non-autistic peers (Nowell et al., 2014; Toseeb et al., 2018, 2020a). This may be due to the behavioural and emotional characteristics of autistic children such as failing to follow the social rules, showing higher aggressive and coercive behaviours, and poorer social and emotional functioning (Humphrey & Hebron, 2015; Toseeb et al., 2018). There may also be some other unmeasured reasons. For instance, deficits in social cognitive skills, i.e., ToM and EF, and the double empathy problem between the autistic and non-autistic siblings, are likely to further trigger the rates of sibling bullying in such families (Cook et al., 2010; Coolidge et al., 2004; Kandemir Özdiñ, 2019; Menesini et al., 2010). Furthermore, there is higher parental differential treatment and favouritism in families where a child is autistic compared to families of non-autistic children which may

further increase the prevalence of sibling bullying in such families (Brody et al., 1992; McHale et al., 1986; McHale & Pawletko, 1992). Hence, sibling bullying seems to be more prevalent in families where a child is autistic due to additional individual- and family-level risk factors in place compared to families formed by non-autistic children only.

Several other factors could be speculated as to why autistic children are at an increased risk for sibling bullying. For instance, some suggest that the lack of theory of mind skills in autistic children increases their likelihood of being a victim of bullying (Van Roekel et al., 2010). Relatedly, some others argue that the more advanced social skills of non-autistic siblings – compared to their autistic siblings – may provide them with the appropriate arrangements to socially manipulate – indirect bullying – their autistic siblings (Smith, 2004; Sutton et al., 1999). Furthermore, due to their difficulties in the social processing of appropriate social interactions (Frith & Hill, 2004), autistic children may perpetrate bullying actions without being aware of the consequences of their such behaviours (Van Roekel et al., 2010). Finally, autistic children experience greater mental health difficulties than their non-autistic peers (Lundström et al., 2011) which is likely to increase their risk of being involved in sibling bullying both as the victim and the bully (Dantchev & Wolke, 2019). This increased probability of being involved in sibling bullying is likely to place autistic individuals at an increased risk for its harmful consequences than their non-autistic peers.

## **2.5 Sibling Bullying in Cross-Cultural Context**

Although there is growing evidence on the prevalence, precursors, and outcomes of sibling bullying, the available evidence comes primarily from Western cultures while little is known about its dynamics in non-Western cultures. That said, there has been no cross-cultural understanding of the dynamics of sibling bullying. This is problematic in various ways. For instance, the varying prevalence of sibling bullying may introduce potential variations in the outcomes of sibling bullying as a dose-effect relationship has been

established between sibling bullying exposure and adverse developmental outcomes (Dantchev et al., 2018; Liu et al., 2020; Wolke & Skew, 2012). Finally, taking Henrich et al.'s (2010), suggestion into account, i.e., results and conclusions arising from research conducted by Western scientists on Western subjects using Western-developed tools must not be generalised to non-Western cultures, it could be argued that lack of cross-cultural understanding of sibling bullying is particularly problematic in regard to effective prevention and intervention of sibling bullying as, to date, all available intervention programmes are based on the dynamics of sibling bullying in Western cultures. Hence, there is a growing need for cross-cultural research for a complete understanding of sibling relationships and bullying (Cicirelli, 1995; Sabah et al., 2022).

To the best of my knowledge, no cross-cultural research has been conducted on sibling bullying. However, both theoretical assumptions and empirical findings from single-culture studies point towards cross-cultural variations in the dynamics of sibling bullying. In terms of theoretical assumptions, i.e., EST (Bronfenbrenner; 1979), broader societal norms and values such as children's rights (e.g., life, health, education), individualistic and collectivistic norms, income inequality, poverty, and violence rates are expected to create imbalanced opportunities for sibling bullying across distanced cultures. Supporting this with empirical evidence, relatively higher rates of sibling bullying, i.e., 30-78%, have been recorded in Western cultures such as the United Kingdom (Dantchev et al., 2019; Tippett & Wolke, 2015; Toseeb et al., 2018, 2020a) and the United States (Skinner & Kowalski, 2013; Tucker et al., 2013) compared to much lower rates, i.e., 10-20%, in non-Western cultures such as China (Liu et al., 2021; Peng et al., 2022; Qing et al., 2022). Taken together, the existing theoretical and empirical assumptions flag potential cross-cultural variations in the dynamics of sibling bullying across culturally distanced, i.e., Western and non-Western, countries.

## 2.6 Sibling Bullying During Covid-19

According to the World Health Organisation (2023), Covid-19 is a highly contagious disease caused by the SARS-CoV-2 virus, which first emerged in late 2019 in Wuhan province, China. Its highly transmissible nature forced governments all around the world to impose nationwide social restrictions in order to protect public health. Such social restrictions included, but were not limited to, nationwide or local lockdowns, school closures, stay-at-home restrictions, and several social distancing measures. The nature of such social restrictions, in most cases, meant changes in routines, social isolation, home confinement, constant contact with family members, and increased unsupervised time siblings spent together. Such unexpected and highly profound social measures brought challenges to intra-family relationships, with those with pre-existing challenges in place being affected even more adversely than others (Asbury et al., 2021; Feinberg et al., 2022).

Early studies on the impact of Covid-19 have shown an immensely profound impact of social restrictions on intra-family dynamics. For instance, some researchers have found that the pandemic had profound detrimental impacts on parental anxiety, depression, stress, burden, and intra-familial relationships (Asbury et al., 2021; Russell et al., 2020).

Additionally, some others have reported increased family chaos since the onset of the pandemic with spillover impact on parent-child relationships and sibling relationships (Cassinat et al., 2021). Taking these early findings into account, some researchers predicted that such intra-family challenges, introduced by the pandemic, would lead to other intra-family troubles such as parent-child and sibling conflict and violence (Pereda & Díaz-Faes, 2020; Perkins et al., 2021; Prime et al., 2020).

Despite researchers' early predictions, only a few studies to date have investigated the potential detrimental impacts of the Covid-19 pandemic on sibling relationships. Aligning with early predictions, evidence from the general population has so far shown that Covid-19

deteriorated sibling relationships as increased rates of sibling conflict and violence were measured, in most families, since the onset of the pandemic (Cassinat et al., 2021; Horton et al., 2022; Salmon et al., 2022). Taking existing evidence further, recent research has shown increased rates of sibling bullying in Indonesian adolescents since the onset of the pandemic (Borualogo & Casas, 2023). Similarly, some other researchers have also found increased rates of sibling conflict and violence in families of autistic children and adolescents since the onset of the Covid-19 pandemic (Stadheim et al., 2022; Toseeb, 2022). Hence, although the literature is severely limited, the existing evidence, from the general and autistic populations, points towards increased sibling conflict and bullying during the pandemic, compared to pre-pandemic. Though, to date, no cross-cultural understanding of the impacts of Covid-19 on sibling relationships exists, neither in the general nor in the autistic population. Consequently, there is an urgent need for cross-cultural research to better understand the impacts of Covid-19 on sibling relationships, especially in families of autistic children where pre-existing challenges were already in place.

## **2.7 Contribution of the Current Thesis**

Sibling bullying is prevalent in the lives of adolescents both in the general as well as the autistic population. Though, the existing findings, from single-country studies, point towards a potential variation in the prevalence of sibling bullying across cultures. However, it is not yet clear whether these variations are due to differing conceptualisation and measurement practices of sibling bullying or whether they reflect higher rates of sibling bullying in certain cultures than others. In this thesis, [Study I](#) (Chapter IV) adapts a well-known English-originated sibling bullying measure into the Turkish language to increase consistent measurement practices between English- and Turkish-speaking populations. Using both the original and adapted versions of this measure, [Study II](#) (Chapter V) explores the

potential variation in the prevalence of sibling bullying between British and Turkish families of autistic adolescents.

Sibling bullying is associated with a range of mental health difficulties. Though, this link may not be a straight line, as recent research in the general population has shown indirect relationships between sibling bullying and mental health through emotion regulation. The nature of this relationship has so far remained unclear in the autistic population. In this thesis, [Study II](#) and [Study III](#) explore the direct and indirect links between sibling bullying and mental health in British and Turkish autistic adolescents. [Study II](#) provides a cross-cultural perspective on the nature of this association, while [Study III](#) (Chapter VI) brings a casual interpretation.

The risk of being involved in sibling bullying seems to have been heightened during the Covid-19 pandemic mainly due to the increased time siblings spent together at home. This risk appears to have been higher in families where a child is autistic as these families were disproportionately affected by Covid-19 and associated social distancing measures. In the current thesis, [Study IV](#) (Chapter VII) adds to the literature as it provides the first insights into potential variation in the impact of Covid-19 on sibling relationships across two distant cultures – British and Turkish – where social distancing measures were in place at differing stringency.



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## Chapter 3: A Feasibility Check

Emre Deniz

### Abstract

The current feasibility study tested the appropriateness of a proposed methodology that aimed to be applied in the study presented in [Chapter 5](#). More specifically, this small-scale study tested the feasibility of four methodological aspects: *1) a two-stage consent (i.e., parental consent and child assent), 2) recruitment strategy, 3) inclusion criteria, and 4) measures.*

Given that all the psychological measures to be used in the proposed study were developed in English and extensively tested in British culture, the feasibility study only took place in Turkish culture where English is not the native language of the population. In total, 20 families of autistic adolescents (i.e., a parent, an autistic child, and a non-autistic child from each family) were aimed to be recruited within a two-week timeframe. Overall, the two-step consent process worked efficiently to prevent children who did not wish to take part in the study from answering the questionnaires as four children did not participate even though their parents consented to their participation. Additionally, the target parent sample was successfully recruited within the projected timeline, although some challenges were flagged in the recruitment process, i.e., a high number of parents had to be eliminated due to a strict inclusion criterion. Moreover, a high attrition rate was observed in one of the scales due to its length. The methodological challenges are discussed in detail and revisions are suggested for the main study.

**Keywords:** Autism, sibling bullying, social and emotional functioning, mental health.

**Citation:** This chapter presents a feasibility study of the work presented in [Chapter 5](#) and is not subject to publication.

### 3.1 Introduction

Sibling bullying is prevalent and has detrimental outcomes in the lives of autistic adolescents. Previous studies have shown that around one in two autistic adolescents experience sibling bullying which is associated with increased mental health difficulties (Deniz & Toseeb, 2022; Toseeb et al., 2018, 2020). Although there is a link between sibling bullying and mental health difficulties, recent studies have suggested that the nature of this association may be indirect. For instance, some researchers have found that sibling bullying increases internalising and externalising problems of autistic adolescents through reduced self-esteem (Deniz & Toseeb, 2022). In addition, Toseeb et al. (2020) have found that sibling bullying is linked to reduced social skills which, in turn, is correlated with increased mental health difficulties in autistic adolescents. Moreover, a recent finding, from the general population, has indicated that emotion regulation significantly mediates the associations between sibling bullying and mental health in middle childhood (Fite et al., 2022).

Although sibling bullying is highly prevalent, its prevalence varies across Western and non-Western cultures. For instance, higher rates of sibling bullying (30-80%) have been reported from western families such as British and American (Dantchev et al., 2019; Duncan, 1999; Finkelhor et al., 2006; Tucker et al., 2013) compared with non-western families such as Chinese (20%-30%) (Liu et al., 2020, 2021; Peng et al., 2022; Qing et al., 2022). This may be due to the differing cultural values between Western and non-Western families, such as individualism and collectivism. For instance, parental differential treatment, which is linked to negative sibling interactions such as conflict and bullying (Brody et al., 1992), is perceived more negatively in individualistic families than in collectivist ones (McHale et al., 2005). Additionally, parentification – caregiving responsibilities of siblings – is higher in Western than non-Western families (Kosonen, 1996; Updegraff et al., 2011) which is linked to increased sibling conflict and, potentially, bullying (McHale & Gamble, 1989).

Notwithstanding, non-western families are more likely to apply physical punishment as part of disciplinary measures compared to Western families (Aytac et al., 2019) which may result in a higher risk of sibling bullying in non-western families compared to Western ones (Cicirelli, 2013). That is, differences in cultural norms, values, and family characteristics may result in differing rates of sibling bullying across distanced cultures.

Although previous studies have shown varying rates of sibling bullying across culturally distanced countries, this may be due to the differences in the conceptualisation of bullying. Additionally, while it is evident that sibling bullying is linked to mental health difficulties, this may be an indirect correlation through third factors. Moreover, no research to date has tested whether the direct and indirect correlates of sibling bullying show variations across cultures. To close this gap in knowledge, a cross-cultural study was proposed to test the cross-cultural variability in the prevalence and correlates of sibling bullying between families from a Western (United Kingdom) and non-Western (Turkey) culture in the autistic population (see [Chapter 5](#)). Given that this is the first study to test the cross-cultural variability in the prevalence and correlates of sibling bullying between British and Turkish families, many uncertainties existed in regard to the proposed methodology of the study. Hence, the current study aimed to test the feasibility of the methodology, i.e., consent procedure, participant recruitment strategy, inclusion criteria, and measures, to be applied in the proposed cross-cultural study. In doing so, the following research questions were asked:

- 1) Is the two-stage consent process feasible to recruit child participants?
- 2) Is the participant recruitment strategy sufficient to recruit the target sample size?
- 3) Are the inclusion criteria well-defined to recruit the target sample size?
- 4) Is the response rate on each questionnaire sufficient to handle the missing data?



## **3.2 Methods**

### ***3.2.1 Ethics Statement***

Ethical approval for this pilot study was granted by the Department of Education Ethics Committee, University of York (Ref: FC20/1). Parents provided informed consent for their own as well as their autistic and non-autistic children's participation in the study. Parents who consented to their children's participation were also asked to indicate whether they prefer their children to take part in an online or a face-to-face survey. Autistic adolescents and their siblings also provided informed assent.

### ***3.2.2 Study Location***

Although the main study of this pilot study was planned to take place in two locations - the UK and Turkey (see [Chapter 5](#)) – this feasibility study was carried out exclusively in Turkey, where the questionnaire's original language, English, was not the native language of the participants.

### ***3.2.3 Recruitment Strategy***

In this pilot study, a sample of 20 Turkish families of autistic adolescents, including a parent, an autistic child, and a non-autistic sibling from each family, were to be recruited. The sample size was defined as 10% of the main study target sample size (n=200) from each population. In the feasibility study, three data sources were reached to recruit 20 Turkish families of autistic adolescents: *1- social media (e.g., parental network groups, national and local autism charity groups), 2- personal networks, and 3- local and national autism charities and organisations' networks.*

### ***3.2.4 Inclusion Criteria***

Three inclusion criteria were specified to recruit the target sample: *(1) at least one child in the family must have been previously diagnosed with autism, (2) the autistic child must have at least one non-autistic sibling, and (3) both the autistic and non-autistic child have to be*

*between 10 and 18 years of age.* The latter criterion particularly aimed to recruit siblings closest in age.

### **3.2.5 Measures**

**3.2.5.1 Demographic Information.** In the parent's demographic questionnaire, participants were asked to answer the following questions regarding their own demographic information: gender, marital status, employment status, highest academic qualification, and number of children. Additionally, parents were also asked to report the following demographic characteristics of their children: age, gender, birth order, type of school their children attend (e.g., special, mainstream), and the physical power imbalance between the two siblings.

**3.2.5.2 The Autism Quotient.** The Autism Quotients (AQ), which are currently available in three forms, namely child (Auyeung et al., 2008), adolescent (Baron-Cohen et al., 2006), and adult (Baron-Cohen et al., 2001), are well-known and widely used autism screening measures. In the current study, all three forms were used to assess the autistic traits of the child/adolescent/adult diagnosed with autism in the target sample. The child version was used for those aged 10-11 years old, the adolescent version for those aged 12-15 years old, and the adult version was used for those aged 16 years old or older. Overall, The AQs consist of similarly worded 50 items that are answered on a four-point Likert-type scale (*ranging from definitely agree to definitely disagree*). The Turkish versions of the AQ questionnaires had previously been translated into Turkish and validated in the Turkish population (Cetinoglu & Aras, 2022; Kose et al., 2010) and are available to obtain from the Autism Research Centre's website (2020).

**3.2.5.3 The Sibling Bullying Questionnaire.** The Sibling Bullying Questionnaire (SBQ) was used to assess the sibling bullying, victimisation and perpetration, and experiences of the autistic and non-autistic children in the target sample. The SBQ was

originally adapted from the Olweus Bullying Questionnaire (Olweus, 2007) to measure sibling bullying experiences of children and adolescents (Dantchev & Wolke, 2019). The SBQ measures four different types of bullying experiences, namely physical, verbal, relational, and other types. The SBQ is a 14-item scale that consists of seven sibling bullying victimisation and seven sibling bullying perpetration items answered on a five-point Likert type scale (*1=never, 2=only ever once or twice, 3=2 or 3 times a month, 4=about once a week, 5=several times a week*). In addition to scale items, autistic adolescents and their siblings were also asked whether they clearly understood the items when answering the SBQ to test the scale appropriateness. The SBQ had not been translated into Turkish and validated in the Turkish population at the time of this feasibility study. Thus, to ensure its reliability and validity in this population, a translation and validation study was later carried out in a Turkish sample of adolescents as part of this pilot study (see [Chapter 5](#)).

**3.2.5.4 The Strength and Difficulties Questionnaire.** The Strength and Difficulties Questionnaire (Goodman, 1997) was used to measure the internalising and externalising problems of Turkish autistic adolescents. The SDQ is a well-known parent-report questionnaire that is widely used to assess the internalising and externalising problems of children and adolescents from early childhood to late adolescence. The CBCL, with its eight main domains and 113 items, is a considerably more comprehensive scale than the SDQ in terms of measuring a broad range of mental health difficulties. Additionally, the SDQ had previously been translated into Turkish and validated in a Turkish sample of children and adolescents (Güvenir et al., 2008). The SDQ consists of 25 items that are answered on a three-point Likert-type scale (*0=not true, 1=somewhat true, 2=certainly true*) and is formed by five subscales, namely emotional difficulties, peer problems, hyperactivity/inattention, conduct problems, and prosociality. In the current pilot study, four subscales of the SDQ were used to measure internalising problems (emotional difficulties and peer problems) and

externalising problems (hyperactivity/inattention and conduct problems) of autistic adolescents.

**3.2.5.5 The Child Behaviour Check List.** The Child Behaviour Check List (CBCL, Achenbach & Rescorla, 2001) was used to assess the internalising and externalising problems and emotional dysregulation profile of autistic adolescents. The CBCL is a widely used questionnaire that had previously been translated into Turkish and validated in a Turkish sample of children and adolescents (Dumenci et al., 2004). The CBCL consists of 113 items answered on a three-point Likert-type scale (*0=never, 1=sometimes, 2=often*) and is formed by the following subscales: anxious/depressed, somatic complaints, delinquent behaviour, social problems, thought problems, attention problems, and aggressive behaviour. In the CBCL, the anxious/depressed, and somatic complaints subscales are summed to generate the internalising problems subscale and the delinquent behaviour and aggressive behaviour subscales are summed to generate the externalising problems test scale. Additionally, in the CBCL, the emotional dysregulation test scale is generated by summing 3A subscales (attention problems, aggression, and anxious/depressed).

**3.2.5.6 The Autism Social Skills Profile.** The Autism Social Skills Profile (ASSP) was specifically developed to measure the social functioning of autistic children and adolescents (Bellini & Hopf, 2007). The ASSP is a 45-item scale that is answered on a four-point Likert-type scale (*1=never, 2=sometimes, 3=often, 4=very often*) and formed by three subscales: social participation, social reciprocity, and detrimental social behaviours. The ASSP had previously been translated into Turkish and validated in a sample of Turkish autistic children and adolescents (Demir, 2009). The Turkish form of ASSP (Demir, 2009) is slightly shorter than its original form as four items were removed due to low factor loadings. Therefore, in this feasibility study, the 41-item version of the ASSP was tested in a Turkish sample of autistic adolescents.

### **3.2.6 Feasibility Evaluation**

The current pilot study is exploratory, in its nature, as its main aim was to evaluate the methodological appropriateness of the proposed cross-cultural study (see [Chapter 5](#)) in four main domains: *consent process*, *recruitment strategy*, *inclusion criteria*, and *measures*. Since previous researchers have suggested that pilot studies should only include descriptive analysis and focus on the feasibility of the main study (Lancaster et al., 2004), no inferential statistics were conducted on the feasibility data. Therefore, the feasibility study was designed to report the following: participant characteristics, consent/assent rate, questionnaires' completion rates, and the overall survey completion time.

## **3.3 Results and Discussion**

This feasibility study was conducted to test the methodological appropriateness of the study in [Chapter 5](#). Overall, the feasibility study showed that the proposed methodology had strengths while also flagging some potential methodological challenges. Methodological challenges and recommended revisions are discussed below.

### **3.3.1 Sample Characteristics**

In total, 22 parents and 18 autistic and non-autistic siblings participated in the study. All parents and non-autistic siblings took part in the online survey distributed by Qualtrics software (2020). Autistic adolescents, however, took part either in the online (n=8) or in-person survey (n=10). This was due to 10 parents indicating that their autistic child would not be able to answer an online survey on their own. Of parents, 68% were mothers, 85% were married, 50% had a college or above degree, about 55% were in paid employment and 55% had only two children. Of autistic adolescents, 82% were males, 64% were attending a mainstream school, 50% were older than their non-autistic siblings while the other half were younger, and their mean age was 13.05. Of non-autistic adolescents, 55% were females and

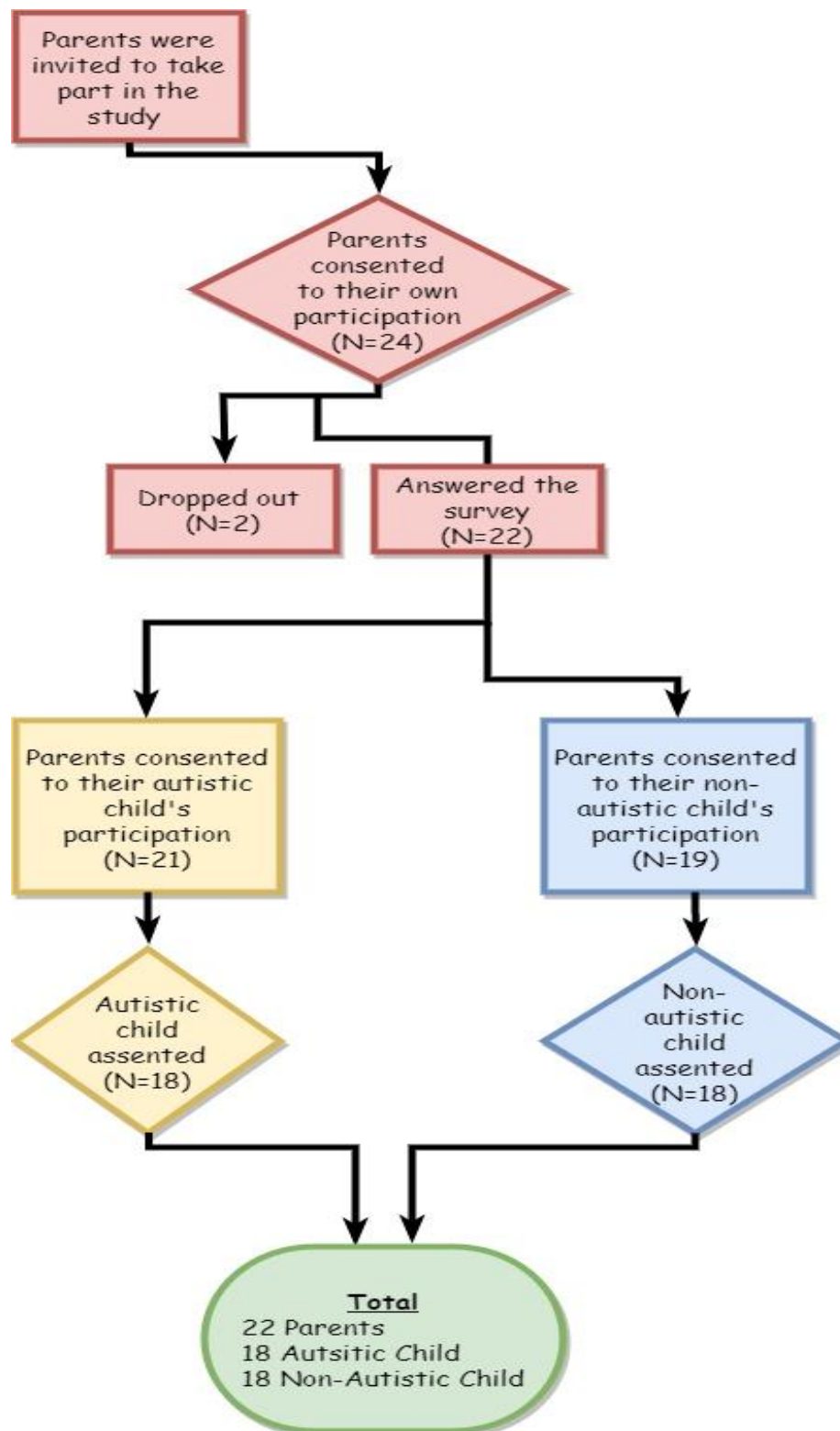
their mean age was 13.22. Additionally, 32% of autistic adolescents were physically stronger than their non-autistic siblings while 36% were physically weaker.

### ***3.3.2 Research Question 1***

First, the feasibility study tested whether a two-stage consent process (i.e., parental consent and child's assent) is feasible to recruit child participants. This was to minimise the chances of children taking part in the study without their own assent. In the feasibility study, the two-stage consent process appeared to work well as some children did not take part in the study either due to parents not consenting to their participation or children not assenting to their own participation. More specifically, one parent did not consent to their autistic child's participation and three parents did not consent to their non-autistic child's participation in the feasibility study. Additionally, three autistic children and one non-autistic child preferred not to take part in the survey even though their parents consented to their participation. Hence, four autistic and four non-autistic siblings did not take part in the feasibility study. Although the number of autistic and non-autistic siblings that took part in the pilot feasibility study was equal ( $n=18$ ), not all families created a sibling dyad. That is, in some families, only the autistic child took part in the study but not the non-autistic child and vice versa. The use of the two-stage consent in the recruitment process is illustrated in Figure 1. These findings indicated that the two-stage consent process was necessary to ensure no child takes part in the study without their assent.

A child's assent is an indication of their affirmative agreement to take part in a study without a need for a complete understanding of the study (Erb et al., 2002). Previous researchers (Oulton et al., 2016; Roth-Cline & Nelson, 2013) and the American Psychological Association (2016) suggest that it is crucial to give children an opportunity to understand the study – to the best of their ability – and give them a voice to indicate whether they are willing to participate in the study or not to comply with the code of ethics and

respect their human rights. Therefore, although a combination of parental consent and the child's assent predicted a loss in the number of child participants and sibling dyads in the main study, this consent procedure was retained in the main study to prevent children from taking part in the main study without their own assent. Due to the use of this two-stage consent process, the feasibility study predicted that the number of parents would potentially outweigh the number of siblings and that there may be fewer sibling dyads than the total number of recruited child participants in the main study.

**Figure 1 (3.1)***The Use of Two-Stage Consent In The Recruitment Process*



### **3.3.3 Research Question 2**

Second, the feasibility study looked to see whether the participant recruitment strategy was effective in reaching the target sample size in the proposed study. In the feasibility study, 20 families of autistic adolescents, including a parent, an autistic child, and a non-autistic sibling, were aimed to be recruited within a two-week period. This aim was to test whether a 3-month data collection period would be sufficient to recruit over 200 families of autistic adolescents from each culture in the proposed study. The feasibility findings showed that the participant recruitment strategy was successful in recruiting the target number of parents (n=22) within a two-week period. However, the number of autistic and non-autistic siblings recruited in the feasibility study (n=18) remained slightly below the target sample size due to the two-stage consent process applied. That is, a revision was needed in the tested recruitment strategy to ensure that the target sample size will be recruited in the main study. Given that the main study's target sample size is significantly larger than the targeted sample size in the feasibility study, it appeared particularly important to support this recruitment strategy with a more robust data source to be able to recruit a higher number of parents and autistic and non-autistic siblings in the main study. For this, school-based participant recruitment is suggested to be incorporated with the feasibility study recruitment strategy in the main study. Such an addition to the recruitment strategy holds promise to boost the number of child and parent participants in the main study.

### **3.3.4 Research Question 3**

Third, the feasibility study tested whether the participant inclusion criteria were well-defined to reach the target sample size in the main study. Although the target sample of parents was reached within the projected timeline in the feasibility study, a great challenge arose in the participant recruitment phase which was mainly about the eligibility of the parents who were willing to take part in the study but did not meet the inclusion criteria. Upon receiving the study

invitation on social media or through autism charities' network, many parents of autistic adolescents showed interest in the study, but the majority were not eligible to take part due to not meeting one of the inclusion criteria, namely "both the autistic and non-autistic child had to be between 10 and 18 years of age". Defining such a narrow age range as an inclusion criterion, for both the autistic and non-autistic siblings, posed a great risk for a reduced sample power in the main study. Thus, a revision in this specific inclusion criterion was greatly needed to overcome this challenge in the main study.

Since the main study was proposed to focus on sibling bullying experiences and social and emotional outcomes of autistic siblings, the age criterion for non-autistic siblings was removed to widen the scope of the project. Additionally, previous evidence indicated a wider age range for the adolescence period, from nine to early 20s (Petersen & Hamburg, 1986; Sawyer et al., 2018; World Health Organization, 2020), than the age range that was initially defined in this feasibility study (10-18 years). Taken from there, a new age-related inclusion criterion was proposed to reach autistic adolescents from a wider age range that falls within the adolescence period: "The autistic child must be between 9 and 20 years of age". Such a revision in the said inclusion criterion is expected to increase the sample power in the main study.

#### ***3.3.5 Research Question 4***

Fourth, the feasibility study also aimed to test whether the proposed measures are suitable to use in the main study based on the risk of attrition and the overall survey length. In the feasibility survey, parents were asked to answer 273 items which, on average, took 48 minutes to complete by parents. This brought concerns over attrition and dropouts as researchers have reported that participants are likely to drop out or stop completing a survey if it takes more than 20 minutes to complete (Revilla & Ochoa, 2017). Confirming this suggestion, high attrition was spotted in one of the measures, namely the CBCL, in which 55% of parents did not complete the questionnaire. Such an attrition rate in a questionnaire is likely

to prevent the use of advanced statistical techniques to handle missing data (White et al., 2011), which would then significantly reduce the statistical power of the analysis in the proposed study. The high attrition rate in the CBCL was potentially due to its length as it had the highest number of items (n=113) in the survey. Additionally, the 50-item AQ measures (Child, adolescent, adult), which were the second longest questionnaire in the survey, also significantly increased the length of the survey, thus, posing a great risk for attrition in the main study. These findings indicated that alternative shorter measures to the CBCL and AQ could be effective in minimising this risk of attrition in the main study.

In terms of the revision of the CBCL, the scale was used to measure the internalising and externalising problems and emotional dysregulation profile of autistic adolescents. Given that the SDQ behaved well in measuring the internalising and externalising problems of Turkish autistic adolescents in the feasibility study, it is suggested there is no need for a second questionnaire (i.e., CBCL) to measure the same domain. However, a shorter replacement scale was needed to measure the emotion regulation skills of autistic adolescents in the main study as this domain was not covered by other scales. For this, the Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1997), which is an 8-item scale and has previously been used in both the British and Turkish population was recommended to be used in the main study.

To further reduce the number of items in the survey, the 50-item AQ measures were replaced with their 10-item short forms (AQ-10; Allison et al., 2012). Additionally, given that AQ-Adult and AQ-Adolescent are two identical scales – the only difference is that AQ-Adult is a self-report measure while AQ-Adolescent is a parent-report scale – the AQ-Adult was removed from the survey. That is, in the main study, the AQ-10-Child is to be used to measure the autistic traits of individuals aged 9-11 years and the AQ-10-Adolescent for those aged 12 years and older.

Apart from these revisions, a slight revision was also made to the ASSP scale, although this was not to reduce the scale items. More specifically, the Turkish form of the ASSP was missing four items from the original scale due to the low factor loadings spotted in the validation study (Demir, 2009). Since the proposed main study ([Chapter 5](#)) aimed for cross-cultural comparisons between the UK and Turkey, the removed four items from the Turkish ASSP were decided to be re-added to the questionnaire to have an equal number of items on the questionnaire across the two cultures. Finally, no revisions were required for the SBQ and the SDQ scales as no methodological challenges were encountered in the feasibility study. Overall, these recommended revisions would reduce the number of items in the main study survey by more than half. Based on this, as aimed, the main study survey is projected to take approximately 20 minutes to complete by parents. More information in regard to the scale revisions can be seen in Table 1.

### **3.4 Conclusions**

Despite the methodological challenges, this small-scale study indicated that the proposed methodology could be feasible to recruit the target population for the main study, provided that the suggested revisions are made. Additionally, the revised inclusion criteria are expected to allow the researcher to reach the target sample size more easily in the main study. Moreover, although the use of a two-stage recruitment procedure would potentially reduce the number of recruited child participants and sibling dyads in the main study, it is expected to give children the chance to not take part in the study, if they prefer not to participate. Finally, upon the suggested revisions made in the psychometric scales, all measures are expected to behave well in the main study ([Chapter 5](#)).

**Table 1 (3.1)***Scale Modifications in the Parents' Survey*

No	Domain	Scale	Number of Items	Informant	Completion Rate N (%)	Use in the Main Study	Modifications	Revised Number of Items	Comments
1	Internalising / Externalising Problems	SDQ	20 items	Parent	86%	Yes	None	20 items	The scale is eligible to be used in the main study.
2	Sibling Bullying	SBQ	14 items	Parent	82%	Yes	None	14 items	The scale is eligible to be used in the main study.
3	Social Functioning	ASSP	41 items	Parent	86%	Modify	+4 items	45 items	The missing 4 items from the original scale are to be re-added to the Turkish ASSP for cross-cultural compatibility.
4	Autistic traits	AQ (Child, Adolescent, Adult)	50 items	Parent	90%	Modify	-40 items	10 items	AQ-10 (Child and Adolescent) short forms are to be used in the main study instead of their long forms. The AQ-Adult scale is to be replaced with the AQ-10-Adolescent.
5	Emotion Dysregulation Internalising / Externalising Problems	CBCL	113 items	Parent	45%	No	To be replaced with the ERC	8 items	The CBCL is to be replaced with the ERC in the main study.
6	Demographics	Demographic Questionnaire	35 items	Parent	100%	Yes	None	35 items	The scale is eligible to be used in the main study.
<b>Total</b>			<b>273 items (48 minutes)</b>					<b>132 items (Approx. 20 minutes)</b>	

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## **Chapter 4: Study-I: Sibling Bullying in Turkish Adolescents: Translation and Cross-Cultural Validation of the Sibling Bullying Questionnaire**

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### Abstract

**Purpose:** The primary aim of this study was to translate the Sibling Bullying Questionnaire (SBQ) into Turkish and validate it. A secondary aim was to estimate the prevalence of sibling bullying in Turkish adolescents. **Method:** The SBQ was translated by a team of English-Turkish bilinguals. Self-report data were collected from Turkish adolescents (N=301) aged 10 to 18 years old (mean age=14.25 years, SD=2.46). Confirmatory factor analysis (CFA) was used to confirm the factor structure of the newly translated Turkish SBQ (T-SBQ). Descriptive analyses were then conducted to report the characteristics of the sample and the prevalence of sibling bullying. **Results:** CFA confirmed the original two-factor structure of the T-SBQ indicating that a first-order correlated two-factor model shows the best fit:  $\chi^2=160.33$  ( $p <.001$ ),  $df=61$ , RMSEA=.07, CFI=.95 and TLI=.93. The T-SBQ showed satisfactory levels of internal consistency in victimisation ( $\alpha=.84$ ) and perpetration ( $\alpha=.83$ ) subscales, excellent reliability in the overall test scale ( $\alpha=.90$ ), and a high level of convergent validity when compared with the Revised Sibling Bullying Questionnaire ( $\alpha=.79$ ). In terms of sibling bullying prevalence, approximately half of the adolescents (51%) reported having been involved in some form of sibling bullying in the preceding six months, either as pure-victim (18%), pure-bully (3%) or bully-victim (30%). This result aligns with the findings from other countries such as the United States (41%), Israel (51%), and the United Kingdom (49%). **Conclusions:** The T-SBQ is valid and reliable in measuring sibling bullying in Turkish adolescents and sibling bullying is prevalent in the lives of Turkish adolescents.

**Keywords.** Siblings, bullying, victimisation, questionnaire, Turkish, translation, validation.

## 4.1 Introduction

Nearly 90% of children grow up with at least one sibling in both Western and non-Western societies (Eroğlu & Topkaya, 2019; Tippett & Wolke, 2015). Relationships between siblings bind them in both positive and negative ways (Vangelisti, 2009). While positive sibling interactions contribute to children's cognitive and social development by providing them with precious early years experiences (Boer et al., 2013) negative sibling relationships are associated with social, emotional, and behavioural difficulties (Bank et al., 2004; Toseeb et al., 2018).

Negative sibling interactions tend to include conflict, aggression, fights, violence, abuse, and bullying (Whiteman et al., 2011). Although fights and conflicts are common and seen as normative in sibling relationships (Lamb et al., 2014), there is a lack of consensus surrounding the differences between ordinary sibling conflict and bullying. Sibling conflict is an inevitable part of sibling relationships which is often characterised by rivalry, envy, and jealousy, which are accepted as ordinary parts of sibling relationships (Sanders, 2004). Accordingly, sibling conflicts are categorised as destructive (unreasonable behaviours that damage relationships) or constructive (reasonable behaviours that contribute to a child's development) conflicts, and either type is suggested to be taken seriously as both types have the potential to distress rivals (Caspi, 2011).

Sibling conflicts may result in more harmful behaviours, - bullying- if they start to show the following characteristics: (1) intention to harm, (2) frequent repetition, (3) happens between two children with power imbalance, (4) happens when there is lack of any manipulation by the other person (Olweus, 1984). In addition to Olweus's definition of bullying behaviour, Caffaro (2013) has added three behavioural characteristics that can be classified under sibling bullying as (1) physical aggression that aims to make a sibling feel unsafe or threatened, (2) an increasing frequency of aggression that is not easy to be spotted

and stopped by bystanders, and (3) a refusing attitude/behaviour in relation to respect other sibling's views or emotions. A broader definition of sibling bullying that guides this study is made by Wolke et al. (2015) as: "any unwanted aggressive behaviour(s) by a sibling that involves an observed or perceived power imbalance and is repeated multiple times or is highly likely to be repeated; bullying may inflict harm or distress on the targeted sibling including physical, psychological, or social harm" (p.918).

Sibling bullying is the most frequent and yet the least recognised form of violence in most adolescents' lives (Eriksen & Jensen, 2009). Research has shown that around half of adolescents have been involved in sibling bullying at least once a week (Toseeb et al., 2018; 2020b; Wolke & Samara, 2004; Wolke & Skew, 2011), with boys being more likely to be perpetrators and girls being victims of bullying (Camodeca et al., 2002; Dantchev & Wolke, 2019; Toseeb et al., 2020a). Although sibling bullying is much more common between closely aged siblings (Tucker et al., 2013b), it seems to decrease with age (Toseeb et al., 2020b). Despite this, bullying among siblings has been ignored, as it is often considered by parents and professionals as a routine part of a child's development (Caffaro, 2013).

A growing body of literature suggests that sibling bullying has long-lasting negative effects on adolescents' mental health (Bowes et al., 2014; Dantchev et al., 2018; Natsuaki et al., 2009; Toseeb et al., 2020b). Previous longitudinal studies have shown that sibling bullying in early adolescence predicts a range of mental health outcomes in middle and late adolescence. Being involved in any type of sibling bullying at the age of 11 years, either as a victim or perpetrator, is associated with higher internalising and externalising problems at the age of 14 years (Toseeb et al., 2020b), and lower levels of wellbeing and self-esteem at age 17 years (Toseeb & Wolke, 2021). Additionally, children who experienced frequent sibling bullying at home were twice as likely to show psychiatric disorders such as anxiety, depression, and self-harm, than the ones who did not (Bowes et al., 2014; Wolke & Skew,

2011; Dantchev et al., 2019). Tucker et al. (2013a) found children and adolescents who were victims of any type of sibling aggression, physical, psychological, or property-based, to show greater mental health distress than those who were not involved. Moreover, it is also suggested that sibling bullying in early adolescence is associated with nicotine dependence, and antisocial and high-risk behaviours in late adolescence (Dantchev et al., 2018).

Although there is a consistent body of literature on sibling bullying experiences in childhood or early adolescence and its psychopathological associations in early or late adolescence, it is frequently argued that the current literature is heavily based on the research that has been conducted in Western, Industrialised, Educated, Rich, and Democratic (WEIRD) countries (Lin et al., 2020, Wolke & Samara, 2004). While clear variations in the prevalence, type, and consequences of sibling bullying across cultures have been reported (Ji et al., 2016, Lin et al., 2020), still very little is known about sibling bullying in some non-WEIRD cultures, such as Turkey.

In the Turkish literature, so far, a handful of Turkish researchers have investigated sibling relationships, conflict, and abuse in children and adolescents. For instance, Akduman (2010) investigated sibling abuse and has reported a high prevalence of physical (83%), verbal (78%), relational (45%) and property-based aggression (69%) in Turkish preschool children. Another study focusing on sibling conflict strategies of adolescent girls found that behavioural characteristics of older and younger siblings were correlated with conflict resolution strategies of older siblings, although the study did not indicate any prevalence of sibling conflict (Bayram, 2014). In addition, a study that was conducted with undergraduate students (mean age=21 years) has indicated that 18% of participants have been abused by a sibling and 25% have abused their sibling in their early years (Demirbas, 2016). Apart from these, only one study has so far focused on sibling bullying in Turkish children (9-12-year-



olds) in which a positive and significant association between sibling bullying and peer bullying was reported (Kandemir-Ozdinc, 2019).

The Sibling Bullying Questionnaire (SBQ) is a well-known and widely used scale that has been adopted from the Olweus Bullying Questionnaire (Olweus, 1991) by Wolke and Samara (2004) consisting of the following items: (1) hitting/kicking, (2) taking/ damaging belongings, (3) calling nasty names, and (4) making fun of. The SBQ has been frequently found to be reliable and valid by others in different cultures and languages e.g., in the UK (Tippett & Wolke, 2015; Wolke & Skew, 2011), in Israel (Wolke & Samara, 2004), and in Italy (Menesini et al., 2010). However, when using the SBQ in an Italian sample of adolescents, Menesini et al. (2010) reformulated items of the original SBQ and turned the questionnaire into a 10-item scale (five for bullying and five for victimisation). They took out an item (make fun of) and included two new items to the scale, namely excluding/ignoring and spreading rumours. Following this, Kandemir-Ozdinc (2019) translated the reformulated version of the SBQ (Menesini et al., 2010) into Turkish and revised it by including three more bullying items and turning it into a nine-item sibling bullying scale.

More recently, however, Dantchev et al. (2019) have revised the original SBQ and updated it to a 14-item questionnaire consisting of victimisation and perpetration subscales with three additional items: (1) keeping them out of things on purpose, leaving them out of their group of friends or completely ignoring them, (2) telling lies or spread rumours about them or trying to make others dislike them, and (3) bullying them in another way. Although the validity and reliability of the reformulated version of the SBQ (Menesini et al., 2010) have been previously conducted in Turkey (Kandemir-Ozdinc, 2019), the updated SBQ (Dantchev et al., 2019), which is a more comprehensive scale, has not been validated in the Turkish culture.

#### ***4.1.1 The Current Study***

To the best of the authors' knowledge, no previous studies have reported the prevalence and frequency of sibling bullying in Turkish adolescents from early to late adolescence years (10-18). In addition, it is important to shed light on the possible association between sibling bullying and potential covariates such as age, gender, birth order, and the number of siblings (Camodeca et al., 2002; Wolke & Skew, 2011; Toseeb et al., 2018). Given the potential detrimental effects of sibling bullying on adolescents' psychopathological outcomes, it was crucial to explore and report the prevalence of sibling bullying in Turkish adolescents. In addition, there was a need for a new translation and validation study for the updated version of the SBQ in a Turkish sample of adolescents. Therefore, this study aimed: (1) to translate the original scale into Turkish and validate it in a Turkish sample of adolescents, (2) to assess the factor structure of the newly translated questionnaire, (3) to examine the reliability and validity of the new scale, and (4) to estimate and report the prevalence of sibling bullying in Turkish adolescents. To address these aims, the following research questions were asked:

- (1) What is the factor structure of the newly translated T-SBQ?
- (2) Is the newly translated T-SBQ a reliable instrument to measure sibling bullying in Turkish adolescents?
- (3) Is the newly translated T-SBQ valid in measuring sibling bullying in Turkish adolescents?
- (4) What is the prevalence of sibling bullying in Turkish adolescents?

## **4.2 Method**

### ***4.2.1 Ethical Statement***

Ethical approval for the study was granted by the Department of Education Ethics Committee, University of York (Ref: FC20/1). A two-stage opt-in consent process was used to collect data for this study. In the first stage of the survey, parents were asked to consent to their child's participation. Parents who consented to their child's participation were mostly mothers (62%) with the remaining being fathers (38%). Following parental consent, since the consent age in Turkey is 18 years, all adolescents were asked to provide assent and complete the survey.

### ***4.2.2 Participants***

A convenience sampling method was used to recruit the study participants. First, a cross-sectional online survey was administered to parents of adolescents using the Qualtrics software (Qualtrics, 2020). All parents were recruited via social media, parental online forums, and personal networks. In addition, a snowballing technique in which parents were asked to distribute the survey to the other eligible parents was also applied to reach the target sample. To encourage participation, a prize draw was held for a chance to win one of four Amazon.com.tr vouchers (25₺, 50₺, 75₺, 100₺). Four parents received one of four incentives, on behalf of their children, following the prize draw. At the beginning of the survey, parents were asked to answer two questions, namely their gender and email addresses, and then allow their children to answer the rest of the survey. Adolescents were then asked to answer a short questionnaire containing demographic questions and two different measures of sibling bullying.

### ***4.2.3 Sample Characteristics***

The demographic characteristics of the sample are given in Table 1 and are described here. The sample consisted of a total of 301 adolescents, 162 girls (54%) and 139 boys

(46%). Participants' ages ranged from 10 to 18 years, with a mean age of 14.25 (SD = 2.46). Among the participants, 41% (N= 124) were the firstborn, 26% (N= 78) were middle, and 33% (N= 64) were the youngest. Of the sample, 36% had one sibling, 30% had two siblings, and 34% had three or more siblings. For the present study, similar to the classification of the United Nations International Children's Emergency Fund (UNICEF, 2005), ages between 10 to 12 years were classified as early adolescence (27%, N= 81), 13 and 15 as middle adolescence (36%, N= 108), and 16-18 as late adolescence (37%, N= 112).

**Table 1 (4.1)**

*Sociodemographic characteristics of the sample (N = 301)*

	N	Proportion
<b>Gender</b>		
Female	162	54.58
Male	139	45.42
<b>Age</b>		
10	26	8.64
11	28	9.30
12	27	8.97
13	39	12.96
14	33	10.96
15	36	11.96
16	46	15.28
17	36	11.96
18	30	9.97
<b>Birth Order</b>		
Eldest	123	41.13
Middle	77	25.78
Youngest	99	33.09
<b>Number of Siblings</b>		
1	110	36.21
2	89	30.36
3	102	33.43
<b>Type of School</b>		
Public School	235	78.07
Private School	24	7.97
Faith School	20	6.65
Other	22	7.30
<b>Grade Level</b>		
Primary School	7	2.33
Middle School	115	38.20
High School	163	54.25
Recently Graduated (High School)	16	5.32

*Note.* Recently Graduated (High School) refers to the participants who have recently graduated from high school and have not started their college degree yet due to the time of data collection (summer holiday).

#### 4.2.4 Measures

Adolescents were asked to complete a number of questionnaires. These were all administered in the Turkish language. Full details are provided in the following sections.

**4.2.4.1 The Turkish Sibling Bullying Questionnaire.** The 14-item English SBQ assesses how frequently adolescents have been perpetrators or victims of sibling bullying in the preceding six months (Dantchev et al., 2019). The perpetration question is “How often did you do any of the following to your brothers or sisters in the last six months”: (1) I hit, kicked, pushed or shoved a brother or sister around, or threatened to do this, (2) I took money or other things from a brother or sister or damaged their belongings, (3) I called a brother or sister nasty and hateful names (4) I made fun of a brother or sister in other ways, (5) I kept a brother or sister out of things on purpose, leaving them out of my group or completely ignoring them, (6) I spread rumours about a brother or sister, or tried to make others dislike them, (7) I bullied in another way. The victimisation subscale of the SBQ consists of the same seven items that are reworded for the victimisation experiences: “How often did your brothers or sisters do any of the following to you in the last six months?”. Items 1-2 refer to physical, 3-4 refer to verbal, 5-6 refer to relational, and item 7 refers to other types of sibling bullying/victimisation that are not covered by the first six items (Dantchev et al., 2019; Menesini et al., 2010; Wolke & Samara, 2004). Participants are asked to respond to both sets of questions on a five-point Likert scale (1= *never*, 2= *only ever once or twice*, 3= *2 or 3 times a month*, 4 = *about once a week*, 5= *several times a week*).

A Turkish version of the SBQ was developed for this study using the expert committee approach (Beaton et al., 2000). The expert committee consisted of five bilinguals. In the committee, two translators were aware of the concept of the questionnaire, two were experts in linguistics and one was a native speaker of both languages; however, the latter was blind to the questionnaire and the field. As the first step, two bilingual translators conducted

the forward translation of the SBQ from English to Turkish, independently. Second, the expert committee discussed the discrepancies between the two translations and drafted the Turkish version of the SBQ. Third, two bilingual translators, blind to the English version of the SBQ, back-translated it to English to ensure the accuracy of the forward translation. Fourth, the expert committee checked and resolved the discrepancies between forward and backwards translations and revised the wording. Fifth, the expert committee agreed that the Turkish version of the questionnaire had content validity and named the new scale as *the Turkish Sibling Bullying Questionnaire (T-SBQ)*. As the last step, the reliability and validity of the T-SBQ were tested in a Turkish sample of adolescents. The newly translated T-SBQ and the translation procedure can be seen in Table S1 and Figure S1 (supplementary materials).

**4.2.4.2 The Revised Sibling Bullying Questionnaire.** The Revised Sibling Bullying Questionnaire (R-SBQ; Kandemir-Ozdinc, 2019), which is a Turkish adaptation of the questionnaire that Menesini et al. (2010) adapted, was also administered to the adolescents to test the convergent validity of the T-SBQ. The R-SBQ is a 9-item self-report questionnaire that measures adolescents' sibling bullying (perpetration-only) behaviours on a five-point Likert-type scale. The scale's inter-item reliability was measured as  $\alpha = .63$  and the one-factor structure of the R-SBQ (perpetration) was reported as follows: ( $\chi^2 = 68.00$ ,  $df = 24$ ,  $p = .00$ ;  $\chi^2/df = 2.8$ ; GFI = .98, CFI = .96, TLI = .94, SRMR = .03, RMSEA = .05). Although the Turkish R-SBQ does not show high internal consistency, it showed a similar reliability score ( $\alpha = .63$ ) as the original scale ( $\alpha = .65$ ; Menesini et al., 2010).

#### **4.2.5 Data Analyses**

All statistical analyses were conducted on STATA/ MP version 16.1 (Stata Corp., 2019).

**Research Question 1.** Prior to confirmatory factor analysis (CFA), a principal component analysis (PCA) with the Promax rotation method was performed to decide the

number of factors related to the items on the T-SBQ. Further, to determine whether the factor structure of the T-SBQ adhered to the hypothesised structure, a CFA was conducted. Each of the items was treated as a continuous variable. The victimisation items were loaded onto a victimisation latent variable and the perpetration items were loaded onto a perpetration latent variable. The residuals between victimisation and perpetration method factors were also correlated. The Maximum Likelihood (ML) estimation with missing data algorithm was used to perform the CFA. The linearity, multicollinearity and univariate normality were tested to check any possible disturbance in the data, as the ML requires normal distribution. To check the linearity, data visualisation techniques were used (residual/scatter plots and histograms) and no violation was identified. Variance inflation factor ( $VIF, \leq 5$ ) and Tolerance ( $\geq 0.1$ ) values were measured to check the multicollinearity. Collinearity tests indicated that the data met the assumption of multicollinearity; *Tolerance = 0.33 - 0.62 and VIF = 1.68–2.97* (Mean= 2.19, see Table S2, supplementary materials). Lastly, skewness and kurtosis values were checked for univariate normality and data indicated normal distribution with no skewed or flatty trends as all the values ranged between 0 and 1. Model fit was considered adequate where the comparative fit index (CFI) and Tucker-Lewis index (TLI) values were  $\geq .90$  (Hu & Bentler, 1999) and root mean squared error of approximation (RMSEA) values were  $\leq .08$  (Browne & Cudeck, 1992).

**Research Question 2.** Cronbach's alpha ( $\alpha$ ) coefficient was used to assess the internal consistency reliability of the T-SBQ. To do this, inter-item and intra-scale correlation coefficients were calculated. First, item-test and item-rest coefficients were estimated. Second, the correlation between subscales and the overall test scale was tested. Coefficient value  $\geq .70$  is accepted as *adequate* internal consistency reliability (Nunnally, 1978).

**Research Question 3.** The validity of the T-SBQ was tested using two methods, construct and convergent validity. To evaluate the construct validity, a CFA was run on the

original factor structure, and factor loadings of each item were reported. To assess the convergent validity, the total scores obtained from the two measures were correlated and compared. First, inter-scale correlation coefficients between the T-SBQ and R-SBQ were calculated to report whether both scales measure the same construct consistently. Second, correlation coefficients between the subscales of the new measure and the overall test scale of the T-SBQ and R-SBQ were tested to see whether they are significantly correlated and measure the common construct.

**Research Question 4.** Descriptive statistics were generated to determine the prevalence of sibling bullying in Turkish adolescents. The total score of the T-SBQ was used to create three continuous variables -victimisation, perpetration, and overall sibling bullying- with higher scores reflecting the higher levels of involvement. A well-accepted cut-off value, *about once a week* (Dantchev & Wolke, 2019; Toseeb et al., 2018; Wolke & Samara, 2014), was also used to derive binary variables to report the prevalence and frequency of sibling victimisation and perpetration. Participants were categorised as involved in sibling bullying if they reported any type of victimisation/perpetration at least about once a week in the preceding six months. Additionally, adolescents were assigned into four sibling bullying groups according to Dantchev et al.'s (2019) previous classification: (i) Non-involved: Adolescents who reported being victimised and perpetrating their sibling *less than once a week*, (ii) Pure Bullies: Adolescents who reported being victimised *less than once a week* but having perpetrated their sibling *at least once a week*, (iii) Pure Victims: Adolescents who reported having perpetrated their sibling *less than once a week* but being victimised *at least once a week*, and (iv) Bully-Victims: Adolescents who reported both being victimised and having perpetrated their siblings *at least once a week*. Lastly, to report the frequency of the different types of sibling bullying involvement, the following binary variables were derived:



Physical (Items 1 & 2), Verbal (Items 3 & 4), Relational (Items 5 & 6), and Other-type (Item 7).

#### **4.2.6 Missing Data**

The following null hypothesis was proposed: The missing data would be missing completely at random (MCAR). To test this null hypothesis, *mcartest* was run in which a significant p-value rejects the probability of the null hypothesis being true, meaning that the data is not MCAR. The results suggested that the missing data in the data set were MCAR as the p-value was not significant (N= 301,  $\chi^2=2178.72$ ,  $df=21$ ,  $p=.29$ ).

Furthermore, the multiple imputation by chained equations (MICE) technique was used to deal with missing data and to maximise the power. First, the regression (regress) method was specified for imputing the continuous variables, ordered logistic regression (Ologit) for categorical variables, and logistic regression for binary variables (logit). Second, all variables, including sociodemographic variables, were included in the imputation model to increase precision and avoid missing data bias. Third, 10 imputed data sets were created by using the MICE algorithm, fully conditional specification equations, with the specified methods for each variable. The proportions of missing data and the number of imputations for each variable are shown in Table S3 (supplementary materials). Further, all descriptive analyses were then conducted using this imputed dataset by the *mi estimate* command. Factor analyses, however, were conducted by using the “Maximum likelihood estimation with missing data” algorithm.

## 4.3 Results

### 4.3.1 Factor Structure of the T-SBQ

Prior to CFA, a PCA was conducted to test whether the original factor structure would be replicated on the newly translated scale. The PCA suggested that there were three components with eigenvalues greater than one ( $\lambda > 1$ ). Although Kaiser (1960) claims that there are as many reliable factors as there are eigenvalues greater than one, the T-SBQ were loaded on two latent factors. The reasons for doing this were as follows: (1) the original SBQ has a two-factor structure, (2) the third component on the newly translated measure did not explain a big variance in the data (.07), and (3) the semantic concept of the items on the scale is not suitable to be loaded onto the third component. Therefore, two factors were derived with eigenvalues of 6.28 and 1.60, respectively, and together accounted for 56.38 of the variance explained (see Table S4, supplementary materials).

Furthermore, a CFA was run to confirm the measurement model, factor structure and dimensionality of the T-SBQ using the Maximum Likelihood (ML) algorithm. Since the original SBQ has a two-factor structure, two distinct models with a two-factor structure, Model 1: First order correlated two-factor model (two correlated method factors - *victimisation and perpetration*), and Model 2: Second order correlated two-factor bifactor model (a common factor -*sibling bullying*- and two correlated method factors -*victimisation and perpetration*), were tested. According to the CFA results, the model fit indices were as follows: Model 1:  $\chi^2 p < .001$ ,  $df = 61$ , RMSEA = .07, CFI = .95 and TLI = .93, and Model 2:  $\chi^2 p = .008$ ,  $df = 47$ , RMSEA = .043, CFI = .98 and TLI = .97 (see Table 2, Figure 1, & Figure S2). Although both models yielded an adequate fit to the data, *Model 1* was accepted as the factor structure of the T-SBQ due to its more acceptable cut-offs of the factor loadings (see Table 3).

**Table 2 (4.2)***Fit summary of CFA models (N=301)*

CFA models	$\chi^2 (p)$	df	RMSEA	RMSEA CI 90%	CFI	TLI
Model 1- First-order correlated two-factor model	160.333 (.000)	61	.07	.06 ~ .08	.95	.93
Model 2- Second-order correlated bifactor model	73.473 (.008)	47	.04	.02 ~ .06	.98	.97
Suggested cut-off value			< .08 <sup>a</sup>		> .90 <sup>b</sup>	> .90 <sup>b</sup>

Note. <sup>a</sup>Browne and Cudeck (1992), <sup>b</sup>Hu and Bentler (1999).

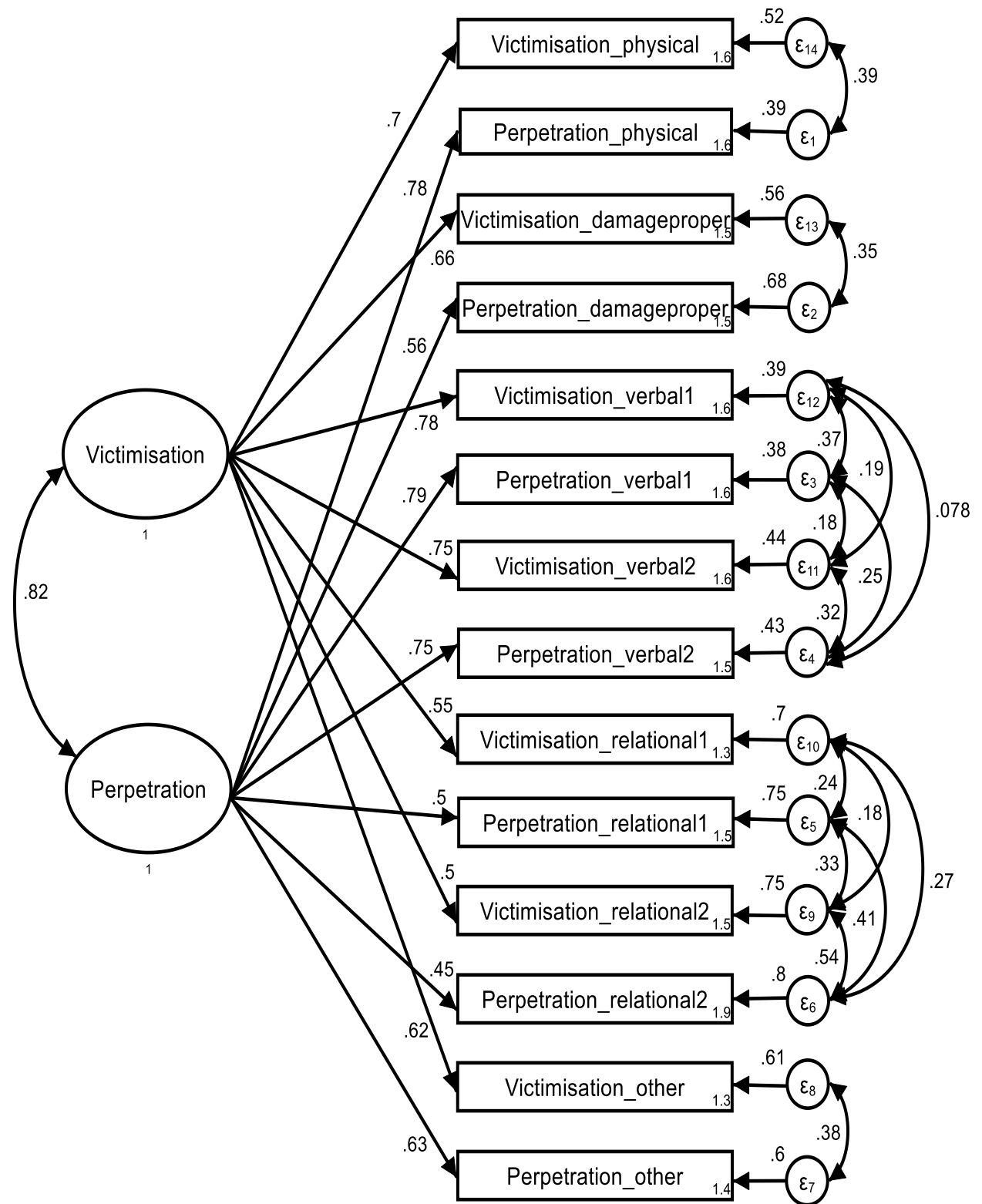
**Table 3 (4.3)***Standardized Estimates of Item Factor Loadings based on the CFA (N=301)*

Item	Model 1		Model 2		
	F1	F2	F1	F2	CF
	Vic	PrP	Vic	PrP	SB
1- I was hit, kicked, pushed or shoved around or they threatened to do this.	.70		.23*		.81
2- I had things damaged or taken from me, including money.	.66		.50		.44*
3- I was called nasty and hateful names.	.78		.45		.58
4- I was made fun of.	.75		.45		.55
5- They kept me out of things on purpose, leaving me out of their group of friends or completely ignoring me.	.55		.60		.23*
6- They told lies or spread rumours about me, or tried to make others dislike me.	.50		.53		.20*
7- I was bullied in another way.	.62		.69		.26*
8- I hit, kicked, pushed or shoved a brother or sister around, or threatened to do this.		.78		.23*	.90*
9- I took money or other things from a brother or sister or damaged their belongings.		.56		.37*	.41*
10- I called a brother or sister nasty and hateful names.		.79		.42*	.61
11- I made fun of a brother or sister.		.75		.48	.53
12- I kept a brother or sister out of things on purpose, left them out of my group or completely ignored them.		.50		.44*	.27*
13- I spread rumours about a brother or sister or tried to make others dislike them.		.45		.57	.13*
14- I bullied in another way.		.63		.66	.30*

Note. F= Factor, CF= Common factor, \*  $r < .45$ .

**Figure 1 (4.1)**

*Model 1: First-order correlated two-factor model*



### 4.3.2 Reliability of the T-SBQ

Cronbach's alpha coefficients indicated that the T-SBQ has excellent internal consistency in the overall test scale ( $\alpha=.90$ ) and good reliability in the subscales (Victimisation,  $\alpha = .84$ ; Perpetration,  $\alpha= .83$ ). The inter-scale and intra-scale correlation coefficients are shown in Table 4, S5 and Figure S3 (supplementary materials). Additionally, the T-SBQ items showed sufficient inter-item correlations ranging from .21 to .70. Although some items showed weak correlations ( $\beta < 0.3$ ), this was observed mostly between the victimisation and perpetration subscales' items, as they intended to measure slightly different constructs. Since the cut-off value for the minimum standardised coefficient was accepted as .2, as suggested by Rummel (1988), no items were removed from the scale because of weak inter-item correlations. Further information regarding the item's Cronbach's alphas, item-test, and inter-item correlations can be seen in Tables S6 and S7 (supplementary materials).

**Table 4 (4.4)**

*The reliability coefficients (Cronbach's alpha) of the scales and subscales (N = 301)*

Scales / Subscales	The SBQ ( $\alpha$ )	The R-SBQ ( $\alpha$ )	The T-SBQ ( $\alpha$ )
1- Victimisation (subscale)	.80*	-	.84
2- Perpetration (subscale)	.74*	-	.83
3- Overall test scale	-	.63**	.90

*Note.* Cronbach's alpha for the overall test scale of the SBQ was not reported and the R-SBQ has no subscales. \* (Dantchev et al., 2019), \*\* (Kandemir-Ozdinc, 2019).

### 4.3.3 Validity of the T-SBQ

The convergent validity of the T-SBQ was good as inter-scale correlations between the T-SBQ and R-SBQ were found to be high ( $\alpha = .79$ ), suggesting that both scales measure sibling bullying in Turkish adolescents, consistently. Additionally, the correlation between the perpetration subscale of the T-SBQ and the overall test scale of the R-SBQ was significantly higher than the correlation between the victimisation subscale of the T-SBQ and

the overall R-SBQ. This was an expected result as the R-SBQ only consisted of perpetration items and did not aim to measure victimisation. Inter-scales and between subscales correlations of the T-SBQ and R-SBQ supported the convergent validity of the new measure (see Figure S3). Additionally, CFA results showed that the factor loadings of the T-SBQ items range from .45 to .79. This suggests that the T-SBQ has adequate construct validity as each observed item was adequately correlated with a method factor.

#### ***4.3.4 Prevalence of Sibling Bullying***

As shown in Table 5, more than half of adolescents, 51% (n=154), reported at least one type of sibling bullying at least once a week. In regards to the bullying roles, the majority of adolescents who experienced sibling bullying were bully-victims (30%), whereas they were least likely to be pure-bullies (3%). Regarding the frequency of the types of sibling bullying, verbal bullying was the most common type of sibling bullying (39%), whereas other-type of sibling bullying was reported as the least common one (14%). Concerning the overall patterns of sibling bullying throughout adolescence, it increased slightly from early adolescence (54%) to middle (57%), and decreased from middle to late adolescence (42%). In addition, the frequency of the types of sibling bullying showed an inconsistent trend during adolescence. On the one hand, physical bullying showed a downward pattern from early (44%) through the middle (42%) and late adolescence (26%). On the other hand, verbal, relational and other-type of sibling bullying increased from early to mid-adolescence and decreased from middle to late adolescence.

Regarding birth order, the number of siblings, and sibling bullying involvement, as shown in Table S8 (supplementary materials), the eldest adolescents showed a higher rate of sibling bullying (63%) than the middle (50%) and youngest (37%) ones, showing that there may be a potential correlation between sibling bullying and birth order. Additionally, adolescents who had one-only sibling showed the highest sibling bullying rate (58%)

compared to the ones who had two (49%), and three or more (45%) siblings. Furthermore, they also showed a higher prevalence of physical sibling bullying involvement (47%) than the adolescents with two (35%) and, three or more (27%) siblings.

Where gender differences are concerned, boys were more likely to be involved in overall sibling bullying (53%), victimisation (49%), and perpetration (33%) than girls (SB=49; V=47; P=32). They were also more likely to take pure-bullies (pb=4%) and pure-victims (pv=19%) roles than girls (pb=3%; pv=17%). With respect to the gender differences in sibling bullying types, boys were more likely to be involved in any types of sibling bullying, physical (p; 39%), verbal (v; 40%), relational (r; 17%), and other-type (o;15%), than girls (p=35%; v=38%; r=14%; o=12%).

**Table 5 (4.5)**

*Sibling bullying involvement by age and gender (N = 301)*

	Girls	Boys	Overall	Early adolescence (Boys/Girls)	Middle adolescence (Boys/Girls)	Late adolescence (Boys/Girls)
	%	%	%	%	%	%
<b><u>Sibling bullying involvement</u></b>						
Victimisation	47	49	48	50 (43/55)	56 (68/46)	38 (36/41)
Perpetration	32	34	33	29 (16/41)	43 (55/34)	27 (29/25)
Overall sibling bullying	49	53	51	54 (47/61)	57.6 (70/48)	42 (42/43)
<b><u>Sibling bullying groups</u></b>						
Uninvolved	50	47	49	44 (53/36)	42 (30/52)	58 (58/57)
Pure-Victims	17	19	18	25 (30/21)	15 (16/14)	15 (13/17)
Pure-Bullies	3	4	3	5 (3/6)	2 (2/2)	3 (5/2)
Bully-Victims	30	30	30	25 (13/36)	41 (52/32)	23 (23/23)
<b><u>Type of sibling bullying</u></b>						
Physical	35	39	37	44 (38/51)	42 (51/36)	26 (29/23)
Verbal	38	41	39	32 (23/42)	48 (62/39)	35 (35/35)
Relational	14	17	15	11 (11/11)	20 (30/13)	13 (9/16)
Other	12	16	14	11 (6/15)	16 (26/8)	13 (13/13)

*Note.* Values in parentheses are showing the prevalence of boys and girls, respectively.

Looking at the age-gender related differences in sibling bullying involvement, girls in early adolescence were more likely to be involved in victimisation (55%) and perpetration (41%) than the girls in middle ( $v=46\%$ ;  $p=34\%$ ) or late ( $v=41\%$ ;  $p=25\%$ ) adolescence. Additionally, girls in late adolescence were less likely to be victimised and bullied than those in early and middle adolescence. In terms of boys, however, those in middle adolescence were more likely to be involved in victimisation (68%) and perpetration (54%) than the ones in early and late adolescence. Moreover, boys were less likely to be victimised during late (36%) and to bully during early (16%) adolescence than boys of other ages (see Table 6).

**Table 6 (4.6)**

*Frequency of Type of Sibling Bullying by Gender (N=301)*

Type	Items	Total (%)	Girls (%)	Boys (%)
<b>Victimisation</b>				
Physical	1- I was hit, kicked, pushed or shoved around or they threatened to do this.	31	29	33
	2- I had things damaged or taken from me, including money.	11	11	11.5
Verbal	3- I was called nasty and hateful names.	25	23	28
	4- I was made fun of.	29	27	32
Relational	5- They kept me out of things on purpose, leaving me out of their group of friends or completely ignoring me.	11	11	10
	6- They told lies or spread rumours about me, or tried to make others dislike me.	5	5	4
Other	7- I was bullied in another way.	10	10	10
<b>Perpetration</b>				
Physical	8- I hit, kicked, pushed or shoved a brother or sister around, or threatened to do this.	22	23	21
	9- I took money or other things from a brother or sister or damaged their belongings.	6	4	9
Verbal	10- I called a brother or sister nasty and hateful names.	19	19	20
	11- I made fun of a brother or sister.	20	20	20
Relational	12- I kept a brother or sister out of things on purpose, leaving them out of my group or completely ignored them.	6	4	7
	13- I spread rumours about a brother or sister or tried to make others dislike them.	2	1	3
Other	14- I bullied in another way.	7	5	10



## **4.4 Discussion**

The aims of this study were to test the psychometric properties of the newly translated T-SBQ and to estimate the prevalence of sibling bullying involvement in Turkish adolescents. The analyses were based on cross-sectional sibling bullying data, self-reported by Turkish adolescents. Results indicated that the T-SBQ is a reliable and valid scale in measuring sibling bullying in Turkish adolescents, confirming its two-factor structure (victimisation and perpetration) as in the original scale. Moreover, it was found that sibling bullying is prevalent in the lives of Turkish adolescents, suggesting that it should be seen as a serious problem by parents and policymakers rather than a normative sibling interaction.

### ***4.4.1 Factor Structure of the T-SBQ***

In regard to the first aim, the newly translated scale showed adequate model fit and good item-factor loadings with a correlated two-factor structure in a Turkish sample of adolescents. This also aligns with the original factor structure of the SBQ (Dantchev et al., 2019). Thus, the original factor structure of the SBQ was replicated and retained as the factor structure of the T-SBQ. The two factors on the T-SBQ were then named victimisation and perpetration, identical to the original scale.

### ***4.4.2 Reliability***

Further analyses were conducted to ensure the internal consistency reliability of the scale. According to the findings, the T-SBQ showed excellent reliability in the test scale suggesting that all the items on the T-SBQ measured the same construct, consistently. Moreover, both subscales of the T-SBQ were also satisfactorily correlated with each other and compatible with the original SBQ (Dantchev et al., 2019); this suggests that both subscales measured similar constructs (victimisation and perpetration). As it has repeatedly been found reliable in previous studies (Dantchev et al., 2019; Kandemir-Ozdinc, 2019; Menesini et al., 2010; Tippett & Wolke, 2015; Wolke & Samara, 2004, Wolke & Skew,

2011), these results also suggest that the Turkish translation version of the new SBQ is a reliable scale in measuring sibling bullying.

#### **4.4.3 Validity**

With reference to the convergent validity of the scale, good inter-scale correlations between the T-SBQ and R-SBQ confirm that both scales are in agreement in measuring sibling bullying in Turkish adolescents. Additionally, although the perpetration subscale of the T-SBQ was found to be highly correlated with the R-SBQ, a moderate association was found between the victimisation subscale and the R-SBQ test scale. This might be due to the construct of the R-SBQ, as it consists of only perpetration items, not victimisation. In regards to the construct validity of the T-SBQ, all items on the SBQ were found to be highly correlated with the rest and had good item-factor loadings. Likewise, to other versions (Dantchev et al., 2019; Kandemir-Ozdinc, 2019; Menesini et al., 2010; Wolke & Samara, 2004), these findings suggest that the Turkish version of the new SBQ is also a valid scale for measuring sibling bullying.

#### **4.4.4 Prevalence of Sibling Bullying**

To the second aim, the prevalence of sibling bullying in Turkish adolescents was estimated, for the first time, and compared with the results of the previous research that has been carried out in other populations. The findings suggested that more than half of the adolescents reported having been involved in at least one type of sibling bullying at least once a week, in the past six months. This result aligns with the findings from other cultures such as the United States of America (Duncan, 1999), Israel (Wolke & Samara, 2004), and the United Kingdom (Toseeb et al., 2018; Toseeb et al., 2020b; Wolke & Skew, 2011).

The overall patterns of sibling bullying fluctuated during adolescence. It increased from early to middle adolescence and decreased from middle to late adolescence. While the current finding that shows an increase in sibling bullying from early to middle adolescence

accords with a previous report from the UK (Toseeb et al., 2020b), the later decrease with age also accords with what Tucker et al. (2013b; 2019) reported in terms of sibling victimisation rates in the U.S. However, it is not consistent with results reported by Kandemir-Ozdinc (2019) and Finkelhor et al. (2006) who reported sibling victimisation perpetration to decrease with age, with the latter being reporting peak sibling violence between six and nine years of age. This difference may be attributed to differences in the age of adolescents and the individual and family characteristics of the research samples.

Concerning the gender differences in sibling bullying, some previous studies argue that boys are more likely to bully a sibling and girls are more likely to be victimised by a sibling (Camodeca et al., 2002; Wolke & Samara, 2004; Wolke & Skew, 2011). However, the current findings indicate that boys were more likely to be involved in both victimisation and perpetration than girls. Although this inconsistency could be attributed to the presence of cross-cultural differences regarding the roles attributed to siblings due to their gender (Cicirelli, 1995), the current findings also accord with some other Western studies' reports. For instance, Duncan (1999) also found boys to be more likely to be involved in any type of sibling bullying. Additionally, another recent study has reported that boys are more likely to be victims and perpetrators of traditional bullying compared to girls (Zsila et al., 2019). One reason underlying this inconsistency can be the bullying measure that is used in the studies. Hara (2002) argued that bullying measures that include more indirect bullying items than direct bullying would provide a higher prevalence of bullying for girls, while another measure with more direct bullying items would provide a higher prevalence for boys.

In addition, aligning with Tippet and Wolke's (2015) findings, the current study indicates that eldest siblings are more likely to get involved in sibling bullying than the middle and youngest ones. Moreover, this result also accords with the findings from a different socio-economic culture, the UK, which suggests that first-born children are more

likely to be bullies and bully-victims compared to second and later-born siblings (Toseeb et al., 2020a). Although Menesini et al. (2010, p.933) suggested that “sibling bullying is related to the quality of the sibling relationship and not to birth order”, they further concluded that “the presence of an older brother per se seems to be a risk factor for the emergence of victimisation at home” which may alienate with the findings of the current study.

Regarding the type of sibling bullying involvement, in line with the previous findings, *verbal* bullying was found to be the most common type of sibling bullying (Skinner & Kowalski, 2013; Wolke & Samara, 2004), whereas the *other-type* of sibling bullying was reported as the least common one (Dantchev et al., 2019). Additionally, consistent with the reported literature, physical bullying has been found as the most common type of sibling bullying during early adolescence (Eriksen & Jensen, 2009; Tippett & Wolke, 2015).

#### ***4.4.5 Strengths, Limitations, and Implications***

Like all other research, this study has some strengths and limitations. One major strength is that this study provides a new valid and reliable scale to the Turkish literature to measure self-report sibling bullying in Turkish adolescents. Since the factor structure of the original scale has been replicated and confirmed on the T-SBQ, the scale also provides future researchers with a cross-culturally comparable tool in which the results from English-Turkish SBQs can be reliably compared. Also, an additional strength could be the intensive translation process of the SBQ in which the expert committee approach was adapted by five bilinguals to provide an accurate Turkish translation. Another strength is that this is the first study to provide the prevalence of sibling bullying in Turkish adolescents from early to late adolescence years (10-18). Even though parents might not be aware of instances of sibling bullying among their children, as it usually happens behind closed doors, some previous researchers have reported the prevalence of sibling bullying based on parents' responses (Eriksen & Jensen, 2009). In this sense, reporting the prevalence of sibling bullying in

Turkish adolescents based on their self-report data could be seen as another strength of this study. A further contribution of this research is that it is expected to gather scientists', experts', parents', and Turkish society's attention to the topic by reporting a prevalent sibling bullying rate in Turkish adolescents.

There were also some potential limitations in this study. First, the instrument used in this study, the R-SBQ, for parallel test reliability and convergent validity of the T-SBQ served as one limitation. Since this scale is a translated version of the old version of the SBQ, six questions out of 14 items on the T-SBQ were the same as or similar to the items of the R-SBQ. Thus, this similarity might have led to the high correlation found between the R-SBQ and T-SBQ test scales. Second, convenience sampling was used to recruit participants to fill out an online survey, further research with randomly recruited representative samples could improve the generalisability of the results. Therefore, all the findings of the present study shall be considered within pointed limitations.

Despite the limitations, the findings of the current study may have several implications for future research on sibling bullying, and the need for prevention and intervention programs at home. First, the current study highlights that sibling bullying is prevalent in most Turkish adolescents' lives and raises the importance of developing and implementing valid intervention programs specifically developed for Turkish adolescents. Second, there is an emerging need to raise bystanders' awareness of seeing bullying among their children as *non-normative*, as it is defined as one of the potential deterrents to the prevention and intervention of sibling bullying (Skinner & Kowalski, 2013). Third, a longitudinal study with a nationally representative sample is needed to shed light on the trajectory of the prevalence of sibling bullying during adolescence and to shed light on the potential covariates of sibling bullying. Likewise, there is a significant need for big-scale cross-cultural studies to identify differences in sibling bullying in different sociocultural

contexts. Finally, this study also encourages other researchers to replicate the current study in the Turkish context, to gain a better understanding of the prevalence and precursors of sibling bullying in Turkish adolescents.

#### ***4.4.6 Conclusions***

The current study sought to translate and validate a measure of sibling bullying in the Turkish language. The newly translated T-SBQ has adequate reliability and validity. Therefore, the measure is a suitable and appropriate scale to measure sibling bullying in Turkish adolescents. The prevalence of sibling bullying in Turkish adolescents is high, in both girls and boys and hits the peak during middle adolescence years. These findings suggest that sibling bullying during adolescence is cause for concern in Turkey and should be seen as a serious problem by parents, policymakers, and researchers, given its well-established links to poor mental health outcomes.

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## Chapter 5: Study II: Sibling Bullying and Mental Health in British and Turkish Autistic Adolescents: The Role of Social and Emotional Functioning

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### Abstract

Nearly one in two autistic adolescents is involved in sibling bullying, which is linked to increased mental health difficulties. Despite its high prevalence, only a handful of studies have focused on the relationship between sibling bullying and mental health in autistic adolescents. Of these, a vast majority of evidence comes from Western cultures while little is known about non-western cultures. For the first time, the current study investigated the cross-cultural variability in the prevalence, risk factors, and mental health correlates of sibling bullying between a Western (the United Kingdom) and a non-Western (Turkey) country. Parents of British (N=289) and Turkish (N=171) autistic adolescents, aged 9-20, years completed online questionnaires. Structural equation models were fitted to test the risk factors for behavioural and mental health correlates of sibling bullying. Overall, sibling bullying was highly prevalent in the lives of both British and Turkish autistic adolescents as more than two-thirds either bullied a sibling or were bullied by a sibling every week. Consistent with previous reports, higher rates of sibling bullying were significantly correlated with poorer mental health in both British and Turkish autistic adolescents. Additionally, sibling bullying was indirectly linked to mental health difficulties through detrimental social behaviours (British and Turkish) and emotion regulation (British-only) in autistic adolescents. There were no indirect correlations between sibling bullying and mental health through social skills in either sample. Implications of these findings as well as cross-cultural similarities and differences are discussed in more detail in light of relevant cross-cultural psychological theory.

**Keywords:** Autism, cross-cultural, emotion regulation, mental health, sibling bullying, social functioning.

## 5.1 Introduction

Sibling bullying is a form of violence that involves frequently repeated aggression that intends to harm a weaker sibling physically, verbally, relationally, or psychologically (Wolke et al., 2015). As many as one in two adolescents in the general population (Deniz et al., 2022; Duncan, 1999; Toseeb et al., 2020a; Tucker et al., 2013) as well as the autistic population (Deniz & Toseeb, 2022; Toseeb et al., 2018) experience sibling bullying. This makes it the most prevalent form of intra-familial violence in the lives of adolescents (McDonald & Martinez, 2016). Despite its overwhelmingly high prevalence, bullying amongst siblings has been overlooked as many consider it a natural part of daily sibling interaction (Caffaro, 2013; Rypi, 2023). This normalising discourse on sibling bullying has potentially contributed to the delay in the discovery of its antecedents and detrimental effects (Skinner & Kowalski, 2013), particularly in autistic samples.

### *5.1.1 Risk Factors and Consequences of Sibling Bullying*

While the literature is severely limited, the present evidence offers some insight into individual and family-level risk factors for sibling bullying. In terms of individual risk factors, being White, male, first-born, having two or more siblings, and having an older brother increase the risk for sibling bullying involvement (Bowes, 2014; Dantchev et al., 2018; Menesini et al., 2010; Tippett & Wolke, 2015; Toseeb et al., 2020a; Tucker et al., 2013, 2014). In regard to family-level risk factors, low family income, low parental education, lone parent status, harsh parenting, parental absence, parental differential treatment, and child-parent and inter-parental conflict are identified as risk factors for increased sibling bullying (Dantchev & Wolke, 2019; Qing et al., 2022; Tippett & Wolke, 2015; Toseeb et al., 2020a; Tucker et al., 2014; Wolke et al., 2015). Although the aforementioned evidence comes from the general population, some of these risk factors, such as being White, first-born, having two or more siblings, harsh parenting, lone parent status,

and low family income, have also been confirmed in the autistic population (Toseeb et al., 2018, 2020b). Adding to this, late-diagnosed autistic adolescents and those who share a bedroom with their siblings are also at increased risk for being involved in sibling bullying (Deniz & Toseeb, 2022). The available evidence is predominantly based on reports from Western cultures. This is problematic as children's development and behaviour are influenced by a number of complex factors, including broader societal influences (Bronfenbrenner, 1979).

Sibling bullying is linked to mental health difficulties in the general as well as the autistic population. In the general population, increased rates of sibling bullying are associated with increased mental health difficulties such as anxiety, depression, self-harm, and internalising<sup>1</sup> and externalising<sup>2</sup> problems (Bowes et al., 2014; Coyle et al., 2017; Duncan, 1999; Liu et al., 2020; Tucker et al., 2013; Toseeb et al., 2020a). Although considerably limited research has been conducted in the autistic population, similar findings have been reported. Autistic adolescents who are involved in sibling bullying, either as the victim or the bully, show higher levels of mental health difficulties (e.g., internalising and externalising problems) than those not involved (Deniz & Toseeb, 2022; Toseeb et al., 2018, 2020b). Hence, the existing evidence draws a clear link between increased rates of sibling bullying and increased mental health difficulties in the general and autistic populations.

Due to its potentially deteriorating effects and high prevalence, an urgent need to protect the mental health of those involved in sibling bullying has been repeatedly flagged (Bar-Zomer & Brunstein Klomek, 2018; Bowes et al., 2014; Deniz et al., 2022; Toseeb & Wolke, 2022; Wolke et al., 2015). The fact that sibling bullying often happens behind closed doors and parents are often unaware of their children's sibling bullying experiences (Wiehe,

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<sup>1</sup> i.e., emotional and peer problems.

<sup>2</sup> i.e., conduct problems and hyperactivity.



1997; Wolke et al., 2015) means that it may not be possible to detect all individuals at risk for sibling bullying. To minimise its negative consequences, researchers have sought to identify mediating factors between sibling bullying and mental health that could potentially serve as a protective mechanism for mental health. One of these, research from the general population, has indicated that being victimised by a sibling indirectly increases mental health difficulties by reducing the emotional regulation ability of the victim (Fite et al., 2022). Similarly, Toseeb et al. (2020a) also argued that emotion regulation is related to both sibling bullying and mental health and that it has the potential to mediate this association. Similarly, in the autistic population, increased sibling bullying has been found to be linked to increased mental health difficulties through worsened self-esteem (Deniz & Toseeb, 2022). These latest findings suggest that intervening in such mediators – emotion regulation and self-esteem – may protect the mental health of those involved in sibling bullying.

### ***5.1.2 Sibling Bullying in Cross-Cultural Context***

Ecological systems theory (EST, Bronfenbrenner, 1979) suggests that the immediate environments individuals live in (e.g., family, neighbourhood, culture) shape the way they think, feel, and behave. Based on this argument, Kuczynski (2003) argues that intra-family relationships are likely to be influenced by broader contextual factors such as family characteristics, neighbourhood socio-economic status, and cultural norms. In support of this, the prevalence and correlates of sibling bullying have been found to vary across culturally distinct populations. For example, more American children (30-85%) are involved in sibling bullying (Button & Gealt, 2010; Duncan, 1999; Finkelhor et al., 2006; Tucker et al., 2013) compared to Chinese (10-20%) children (Liu et al., 2020, 2021; Peng et al., 2022; Qing et al., 2022). That is, sibling bullying is a universal phenomenon, though its prevalence may show cross-cultural variations.

Likewise, the United Kingdom (UK) and Turkey have two distant cultures (Hofstede Insights, 2022) which are likely to reflect upon sibling relationships (Cicirelli, 1995). For example, older siblings are more likely to be caregivers of younger siblings in Western cultures than non-westerners (Updegraff et al., 2011), meaning that British adolescents may be at greater risk for sibling bullying compared to their Turkish peers. In addition, British children are more likely to live in cohabiting families or in single-parent households than Turkish children (OECD, 2023a, 2023b), which are identified as risk factors for increased sibling bullying involvement (Tucker et al., 2014). Conversely, Turkish families are larger, have more children, and show higher rates of poverty than British families (OECD, 2023a, 2023b), all of which may put Turkish children at increased risk for sibling bullying than their British counterparts (Bowes et al., 2014; Tippett & Wolke, 2015). Consequently, the cultural distance between British and Turkish cultures is likely to reflect on the sibling bullying experiences of adolescents living in the UK and Turkey.

### ***5.1.3 The Current Study***

The existing reports indicate strong links between sibling bullying and mental health, although this may not be a direct correlation. A growing body of literature suggests that there may be indirect associations between sibling bullying and mental health through third factors, instead of a direct link. However, the literature on the indirect effects of sibling bullying on mental health is severely limited. So far, only two factors – self-esteem and emotion regulation – have been found to mediate the associations between sibling bullying and mental health (Deniz & Toseeb, 2022; Fite et al., 2022). Although not clear-cut, social skills may also be a mediator between sibling bullying and mental health as previous reports indicate that sibling bullying is correlated with reduced social skills (Dantchev & Wolke, 2019) which, in turn, is correlated with increased mental health difficulties in autistic adolescents

(Toseeb et al., 2020a). Hence, it is not yet clear whether sibling bullying is a direct or indirect risk factor for increased mental health difficulties.

Although bidirectional relationships exist between sibling bullying and social skills and between social skills and mental health in autistic adolescents, no research to date has tested whether social skills play a role in the relations between sibling bullying and mental health. Additionally, the finding that emotion regulation impacts the relationship between sibling bullying and mental health (Fite et al., 2022) comes from the general population which may not apply to the autistic population as the prevalence and mental health correlates of sibling bullying are likely to vary between autistic and non-autistic populations (Toseeb et al., 2020b). Furthermore, nearly all existing evidence on the relationship between sibling bullying and mental health comes from the Western populations which should not be generalised to non-Western cultures where little to no evidence exists (Henrich et al., 2010). Hence, a cross-cultural study was needed to understand the role of emotion regulation and social skills in the associations between sibling bullying and mental health.

To address this gap in knowledge, the current study aimed to investigate the cross-cultural variations in the prevalence, risk factors, and mental health correlates of sibling bullying. Additionally, the present study aimed to examine the mediator roles of emotion regulation and social skills in the relations between sibling bullying and mental health in autistic adolescents from a Western (UK) and a non-Western (Turkey) culture. In doing so, a structural model was proposed hypothesising that sibling bullying may be indirectly correlated with mental health through emotion regulation and social skills. To test this, the following research questions (RQ) were asked: RQ1: *“What is the prevalence of sibling bullying in British and Turkish families of autistic adolescents?”*, RQ2: *“What are the risk factors for sibling bullying in British and Turkish families of autistic adolescents?”* RQ3: *“What are the behavioural and mental health correlates of sibling bullying in British and*

*Turkish families of autistic adolescents?*”, and RQ4: “*Do emotional and social functioning play a role in the associations between sibling bullying and mental health in British and Turkish autistic adolescents?*”. Although cross-cultural differences are expected between the UK and Turkey, the direction of the differences could not be predicted.

## **5.2 Methods**

### **5.2.1 Ethics Statement**

This study is part of a larger-scale study in which ethical approval was granted by the Department of Education Ethics Committee, University of York (Ref: FC20/2). In addition to this ethical approval, permission to recruit participants from Turkish schools was sought from the Turkey Ministry of National Education (Ref: b34d-55f1-3d4e-9ee4-6c65).

### **5.2.2 Design**

To explore the cross-cultural differences in the rates, risk factors, and mental health correlates of sibling bullying, this study adopted the *Etic* approach which simply focuses on the presence or absence of between-culture variations on a psychological phenomenon (Kagitcibasi & Berry, 1989). For this, a set of universal measures, i.e., cross-culturally valid, instead of culture-specific measures, are proposed to be used when exploring the similarities and differences between the British and Turkish cultures in sibling bullying and mental health. Hence, this study takes an outsider’s perspective in exploring the similarities and differences in sibling bullying and mental health between British and Turkish cultures and is not an attempt to conduct in-depth testing of culture-level elements that underlie existing similarities and differences.

### **5.2.3 Sampling**

Convenience sampling was adopted in recruiting parents of British and Turkish autistic adolescents. To be included in the study, families were required to meet all of the following inclusion criteria: 1) at least one child in the family has an autism diagnosis, 2) the

autistic child has at least one neurotypical sibling, 3) the autistic child is between nine and 20 years of age<sup>3</sup>, 4) both children have lived in the same house in the preceding six months. In cases where families had more than one autistic or neurotypical child, they were asked to choose the ones closest in age and answer the survey questions accordingly. To identify autistic adolescents, parents were asked two screening questions: 1) *Have any of your children been diagnosed with autism, Asperger's syndrome or autistic spectrum disorder?* 2) *What types of special education needs or disabilities does your child have?* Adolescents whose parents answered *yes* to the former question or *autism spectrum conditions* to the latter question were identified as autistic adolescents.

Parents of autistic adolescents were recruited from schools, autism charities, referral services, and private special education and rehabilitation centres in both countries. All data were collected online using the Qualtrics software (Qualtrics, 2021). The online survey consisted of pre-developed and validated psychological measures and a set of demographic questions written in participants' native languages (English or Turkish). In total, 301 British parents and 202 Turkish parents completed the distributed surveys. Of these, 12 British parents and 31 Turkish parents were removed from the sample due to not meeting the pre-determined inclusion criteria (e.g., autism diagnosis, age range, etc.). Thus, all analyses were carried out on a sample of 289 British parents and 171 Turkish parents.

#### **5.2.4 Participants**

Sample characteristics of British and Turkish cultures are summarised here in brief and detailed information is outlined in Tables S1 and S2 (Supplementary materials). Over 80% of survey respondents were mothers in both cultures. Of these, more British parents (50%) than Turkish parents (22%) had a college or above degree. Moreover, the mean ages of

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<sup>3</sup>This inclusion criterion was defined to recruit autistic adolescents. According to the World Health Organisation (2023), adolescence is the period of life between childhood and adulthood which covers ages 10 and 19. Since the current study was designed as a 1-year longitudinal study, the lower and upper age bounds were moved 1 year and set as 9 and 20 to maximise the sample power.

autistic adolescents were comparable across cultures (British=12.9 years, SD=2.4; Turkish=12.4 years, SD=3.2). However, Turkish neurotypical siblings were slightly older (Mean=14.3 years, SD=6.6) than their British counterparts (Mean=12.1 years, SD=3.6).

### **5.2.5 Measures**

Parents of autistic adolescents were asked to answer a wide range of questionnaires in regard to demographics, behavioural characteristics, mental health, and sibling bullying experiences of their autistic child. Parents reported their own as well as their autistic children's demographic information. All measures are described here in brief, and detailed information is outlined in Appendix A and Table S3 (Supplementary materials).

**5.2.5.1 Demographic Information.** Parents' demographic information included ethnicity, highest educational qualification, marital status, and their relation with the autistic child (e.g., mother). Children's demographic information included age, gender, birth order, and physical power imbalance between siblings (e.g., the autistic child is physically stronger than the neurotypical sibling).

**5.2.5.2 Autistic Traits.** The Autism Quotient-10 (AQ-10; Allison et al., 2012), which consists of 10 items with responses recorded on a four-point Likert-type scale (*1= definitely disagree, 2= slightly disagree, 3=slightly agree, 4= definitely agree*) was used to assess the autistic characteristics of British and Turkish autistic adolescents. The overall test scores ranged from 10 to 40 with higher scores indicating more autistic traits. In the current study, the autistic traits variable was used as a potential confounder in the analyses.

**5.2.5.3 Sibling Bullying.** The Sibling Bullying Questionnaire (SBQ; Dantchev et al., 2019) was used to evaluate the sibling bullying victimisation and perpetration experiences of autistic adolescents. The SBQ is a 14-item – sibling bullying victimisation (7 items) and sibling bullying perpetration (7 items) – Likert-type scale (*1=never, 2=only ever once or twice, 3=2 or 3 times a month, 4= about once a week, 5=several times a week*). In the current

analyses, sibling bullying victimisation and sibling bullying perpetration were used as predictors with higher scores indicating higher rates of sibling bullying involvement.

Additionally, parents were also asked to respond to two questions in regard to past sibling bullying experiences of their autistic child: 1) “*Has your autistic child ever talked to you about being bullied by their sibling?*” and 2) “*Has your neurotypical child ever talked to you about being bullied by their autistic sibling?*”. The former question was used to construct the past sibling bullying victimisation experiences of the autistic child while the latter question corresponds to their past sibling bullying perpetration experiences.

**5.2.5.4 Emotion Regulation.** The Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1997), which is an 8-item four-point Likert-type scale (*1=never, 2=sometimes, 3=often, 4=almost always*) was used to measure the emotion regulation skills of autistic adolescents. The total scores ranged from 8 to 32 with higher scores meaning better emotion regulation skills. The emotion regulation was used as a potential mediator in the current analyses.

**5.2.5.5 Social Skills.** The Autism Social Skills Profile (ASSP; Bellini & Hopf, 2007), which consists of 45 items that are answered on a four-point Likert-type scale (*1=never, 2=sometimes, 3=often, 4=very often*) was used to measure social skills under two constructs: 1) *Social Functioning*, which refers to meaningful social interaction and participation (*e.g., “Provides compliments to others”*) and 2) *Detrimental Social Behaviours*, which refers to socially inappropriate behaviours and negative peer experiences (*e.g., “Makes inappropriate comments”*). In the current study, social functioning was measured using the social reciprocity and social participation subscales with higher scores meaning better social functioning. Additionally, the detrimental social behaviours subscale was used to measure the negative social interactions of autistic adolescents with higher scores indicating increased detrimental social behaviours.

**5.2.5.6 Mental Health.** The Strength and Difficulties Questionnaire (SDQ; Goodman, 1997), which is a 25-item, three-point Likert-type scale (*0=not true, 1=somewhat true, 2=certainly true*), was used to measure the internalising and externalising problems of autistic adolescents. For this, in line with the SDQ scoring guidelines (Goodman, 2001), emotional (5 items) and peer problems (5 items) subscales were summed to generate internalising problems (10 items) test scale with higher scores indicating higher internalising problems. Additionally, conduct problems (5 items) and hyperactivity/inattention (5 items) subscales were summed to generate externalising problems (10 items) test scale with higher scores meaning higher levels of externalising problems.

### **5.2.6 Data Analyses**

All statistical analyses were conducted using STATA/ MP 17 (StataCorp, 2022). First, the prevalence of sibling bullying, overall and by demographic characteristics, was reported in both cultures (RQ1). Second, a structural equation model (SEM) was fitted to test the individual and cumulative risk factors<sup>4</sup> for sibling bullying (RQ2). Third, Pearson's correlation coefficients were used to test the zero-order correlations between sibling bullying, emotion regulation, social functioning, detrimental social behaviours, and mental health (RQ3). Fourth, a further two SEMs and Sobel's tests were fitted to test the indirect associations between sibling bullying and mental health through emotional and social functioning in both cultures (RQ4). All missing data were handled using two advanced statistical techniques: multiple imputations by chained equations and full information maximum likelihood. More information concerning data analyses can be found in Appendix A and Tables S4-S6 (Supplementary materials).

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<sup>4</sup> The significant individual risk factors for sibling bullying victimisation and sibling bullying perpetration were later combined to generate cumulative victimisation risk index and cumulative perpetration risk index.



## **5.3 Results**

### ***5.3.1 Prevalence of Sibling Bullying***

To answer RQ1, the descriptive analysis showed that sibling bullying was highly prevalent in the lives of autistic adolescents. Approximately 72% of British autistic adolescents and 67% of Turkish autistic adolescents were involved in sibling bullying, either as a victim or a perpetrator. In regard to sibling bullying victimisation, nearly 53% of British autistic adolescents and 45% of Turkish autistic adolescents were victimised by their neurotypical siblings every week. Concerning sibling bullying perpetration, about 65% of British autistic adolescents and 56% of Turkish autistic adolescents bullied their neurotypical sibling every week. Of those involved in sibling bullying, being the bully-victim of sibling bullying was the most common role for autistic adolescents while being the victim-only was the least common role, in both cultures. More details regarding the prevalence of sibling bullying, by sibling bullying roles and demographic characteristics, can be found in Table S7 (Supplementary materials).

### ***5.3.2 Risk Factors for Sibling Bullying***

To address RQ2, an SEM was fitted to test the individual risk factors for sibling bullying, victimisation and perpetration, and to construct cumulative risk factor indices (see, Figure 1). Findings indicated cross-culturally common and culture-specific risk factors for sibling bullying. Regarding cross-cultural similarities, for instance, being victimised by their neurotypical sibling in the past was a significant risk factor for present sibling bullying victimisation in both British and Turkish autistic adolescents. In regard to sibling bullying perpetration, being involved in sibling bullying, both victimisation and perpetration, were risk factors for present sibling bullying perpetration in both British and Turkish autistic adolescents.

Concerning the cross-cultural differences, having an opposite-gendered sibling, a physically more powerful sibling, a male sibling, and having been involved in sibling bullying perpetration in the past were significant risk factors for present sibling bullying victimisation in the British sample, but not in the Turkish sample. Moreover, having a physically weaker sibling was a risk factor for sibling bullying perpetration for British autistic adolescents but not for their Turkish peers. Furthermore, high parental education was a risk factor for sibling bullying victimization in the Turkish sample but not in the British sample. Finally, having a younger sibling was a risk factor for sibling bullying perpetration for Turkish autistic adolescents but not for their British peers.

Taken together, in the British sample, the cumulative victimisation risk index consisted of having an opposite-gendered sibling, having a physically more powerful sibling, having a male sibling, and having previously been involved in sibling bullying victimisation and perpetration. In the Turkish sample, however, the cumulative victimisation risk index consisted of high parental education and having previously been involved in sibling bullying victimisation. With reference to the cumulative perpetration risk index, it consisted of having a weaker sibling and having previously been involved in sibling bullying victimisation and perpetration. In the Turkish sample, however, the cumulative perpetration risk index consisted of having a younger sibling and having been previously involved in sibling bullying victimisation and perpetration.

### ***5.3.3 Behavioural and Mental Health Correlates of Sibling Bullying***

Answering RQ3, direct correlations between sibling bullying, emotion regulation, social functioning, detrimental social behaviours, and mental health were tested using Pearson's correlation coefficients (see Table 1). Findings indicated striking similarities and differences between the two cultures regarding the correlates of sibling bullying. In terms of similarities, increased rates of sibling bullying perpetration were directly correlated with

increased detrimental social behaviours and internalising and externalising problems in both British and Turkish autistic adolescents. Unexpectedly, being a victim of sibling bullying was not directly correlated with reduced emotion regulation or increased internalising problems in either sample. Finally, autistic traits were not correlated with sibling bullying perpetration in either sample.

In terms of cross-cultural differences, increased sibling bullying victimisation was linked to increased externalising problems in British autistic adolescents but not in Turkish ones. Additionally, increased sibling bullying perpetration was directly associated with reduced emotion regulation in British autistic adolescents but not in Turkish ones. Moreover, while increased sibling bullying victimisation was a positive correlate of increased detrimental social behaviours in Turkish autistic adolescents, this was not the case for British autistic adolescents. Finally, sibling victimisation was negatively correlated with autistic traits in the British sample but not in the Turkish sample.

#### ***5.3.4 Sibling Bullying and Mental Health: Indirect Associations***

To address RQ4, two distinct SEMs (SEM-I<sup>5</sup> & SEM-II<sup>6</sup>) were fitted to investigate the indirect associations between sibling bullying and mental health through emotion regulation, social functioning, and detrimental social behaviours. Additionally, the autistic trait variable was controlled as a potential confounder in the models. Moreover, cumulative bullying risk indices (CVRI<sup>7</sup> & CPRI<sup>8</sup>) were also controlled as covariates of sibling bullying in the SEMs. The SEMs indicated acceptable fits to the data in both samples: British SEM-I (*B-SEM-I*)=  $\chi^2$  (p)= .23, RMSEA= .03, CFI=.99, TLI=.98, CD=.51; British SEM-II (*B-SEM-II*)=  $\chi^2$  (p)= .15, RMSEA= .04, CFI=.99, TLI=.97, CD=.46. Turkish SEM-I (*T-SEM-I*)=

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<sup>5</sup> SEM-I: Sibling bullying victimisation and mental health

<sup>6</sup> SEM-II: Sibling bullying perpetration and mental health

<sup>7</sup> CVRI: Cumulative victimisation risk index

<sup>8</sup> CPRI: Cumulative perpetration risk index

Saturated,  $\chi^2(p) = .57$ , RMSEA = .000, CFI = 1.00, TLI = 1.02, CD = .56; Turkish SEM-II (*T-SEM-II*) =  $\chi^2(p) = .40$ , RMSEA = .01, CFI = 1.00, TLI = .99, CD = .61. Overall, Sobel's test indicated significant indirect associations between sibling bullying and mental health in both British and Turkish autistic adolescents. The Sobel's test findings are outlined in Table 2 and detailed path coefficients are shown in Figures 2 and 3 and Tables S8 and S9 (Supplementary materials).

In terms of cross-cultural similarities, sibling bullying perpetration, but not victimisation, was indirectly correlated with internalising and externalising problems through detrimental social behaviours in both British and Turkish autistic adolescents. That is, British and Turkish autistic adolescents who bullied their neurotypical siblings showed high rates of detrimental social behaviours which, in turn, were correlated with high internalising and externalising problems.

In regard to cross-cultural differences, higher rates of sibling bullying, victimisation and perpetration, were indirectly linked to increased internalising problems through reduced emotion regulation in British autistic adolescents but not in the Turkish sample. That is, being involved in sibling bullying is a direct risk factor for reduced emotion regulation and, thus, an indirect risk factor for increased mental health difficulties for British autistic adolescents but not for their Turkish peers. Moreover, sibling bullying victimisation was indirectly linked to internalising and externalising problems through detrimental social behaviours in the Turkish sample, but not in the British sample. This shows that being a victim of sibling bullying was indirectly linked to mental health difficulties in Turkish autistic adolescents through increased detrimental social behaviours, which was not the case in the British sample.

**Table 1 (5.1)***Behavioural and Mental Health Correlates of Sibling Bullying: Direct Associations*

	UK (N=289)		TR (N=171)	
	Victimisation	Perpetration	Victimisation	Perpetration
Autistic traits	-.42***	-.11	-.07	-.15
Emotion regulation	-.05	-.27***	.03	.04
Social Functioning	.29***	.02	.18*	.19*
Detrimental Social Behaviours	.09	.45***	.26***	.42***
Internalising Problems	.09	.25***	.13	.25**
Externalising Problems	.17**	.51***	.10	.24**

*Note.* Path coefficients are reported on full sample size using MICE. The significance level is set as  $p < .05$ .

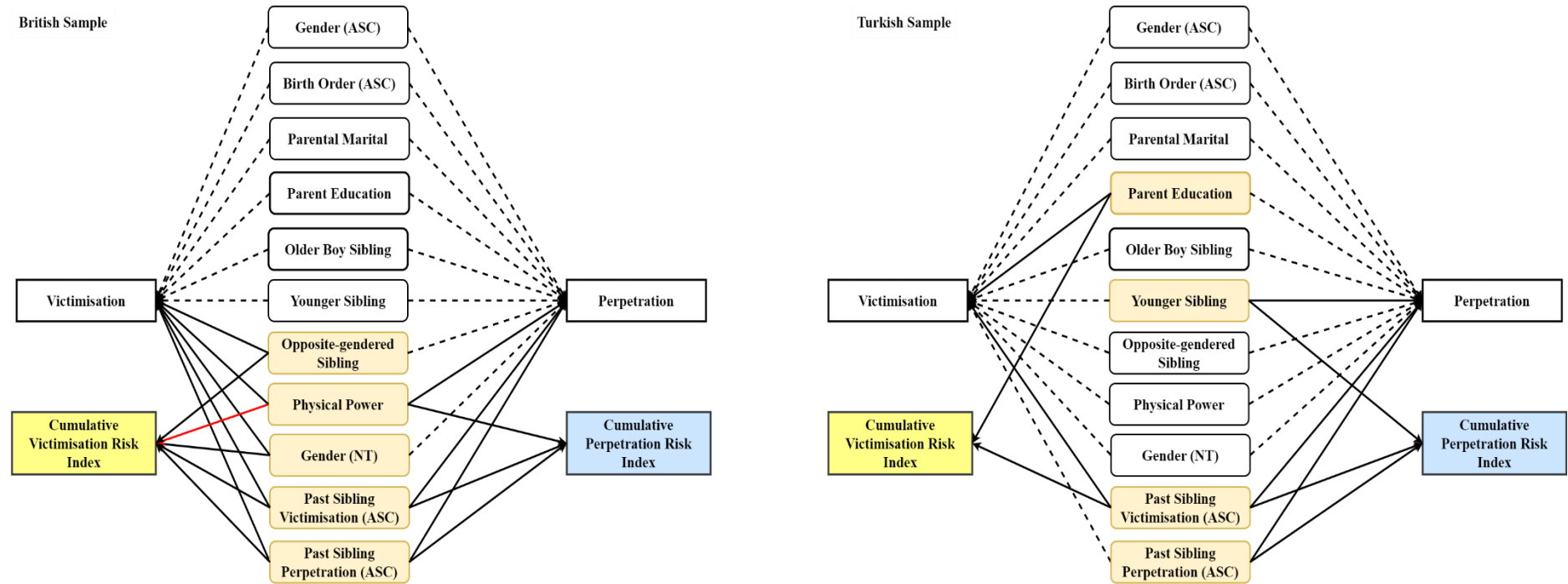
**Table 2 (5.2)***Psychosocial Correlates of Sibling Bullying: Indirect Associations*

	Standardised Coefficients			Indirect effect	Direct effect	Total effect	Standard error	Z	P	95% CI
	X -> M $\beta$	M -> Y $\beta$	X -> Y $\beta$							
<b>British Sample</b>										
Sibling Victimization → Emotion Regulation → Internalising Problems	-.18**	-.21***	.13*	.038	.133	.171	.01	2.14	.03	.01, .07
Sibling Perpetration → Emotion Regulation → Internalising Problems	-.29***	-.23***	.04	.066	.043	.109	.02	2.99	<.01	.02, .11
Sibling Perpetration → Detrimental Social Behaviours → Internalising Problems	.48***	.36***	.04	.173	.043	.216	.03	5.03	<.001	.10, .24
Sibling Perpetration → Detrimental Social Behaviours → Externalising Problems	.48***	.39***	.35***	.187	.354	.541	.03	5.82	<.001	.12, .25
<b>Turkish Sample</b>										
Sibling Victimization → Detrimental Social Behaviours → Internalising Problems	.30**	.38***	.09	.115	.091	.206	.05	2.22	.02	.01, .22
Sibling Victimization → Detrimental Social Behaviours → Externalising Problems	.30**	.26**	.18*	.078	.176	.255	.04	1.90	.05	-.00, .16
Sibling Perpetration → Detrimental Social Behaviours → Internalising Problems	.38***	.35***	.18*	.136	.185	.321	.04	3.08	<.01	.05, .22
Sibling Perpetration → Detrimental Social Behaviours → Externalising Problems	.38***	.21*	.29***	.079	.288	.367	.04	1.99	.04	.00, .15

Note. Significance level: \* =  $p < .05$ , \*\* =  $p < .01$ , \*\*\* =  $p < .001$ .

**Figure 1 (5.1)**

*Correlates of Sibling Victimization/Perpetration by Country*



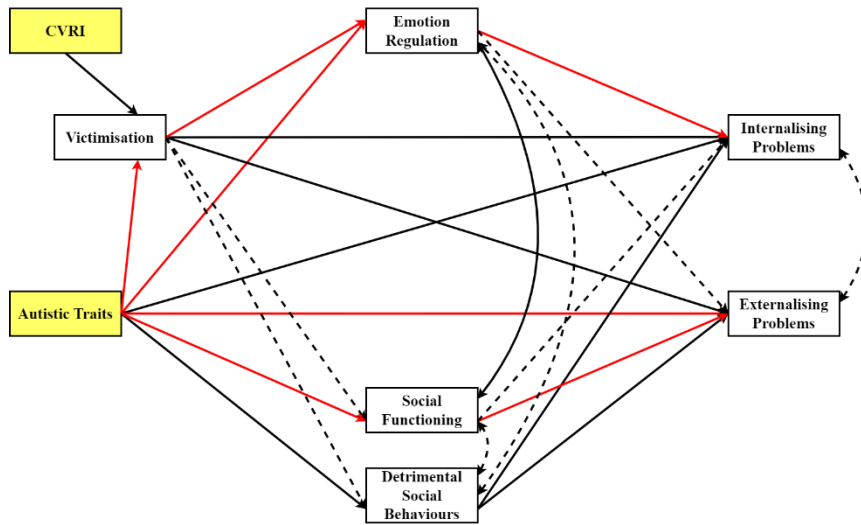
*Gender: 0=Girl, 1=Boy.*  
*Older boy sibling: 0=No, 1=Yes.*  
*Younger sibling: 0=No, 1=Yes.*  
*Opposite-gendered sibling: 0=No, 1=Yes*  
*Birth order NT: 0= First-born, 1=Second or later born neurotypical child.*  
*Birth order ASC: 0= Second or later born, 1=First-born autistic child.*  
*Past sibling victimisation: 0=No, 1= Yes, disclosed to parents.*  
*Past sibling perpetration: 0=No, 1= Yes, disclosed to parents.*  
*Physical power: 0= Autistic child is weaker, 1=Autistic child is stronger.*  
*Parent education: 0= Below college, 1= College or above degree.*  
*Parent marital: 0=Non-married, 1=Married.*

—————> Significant positive paths  
 —————> Significant negative paths  
 - - - - -> Insignificant paths

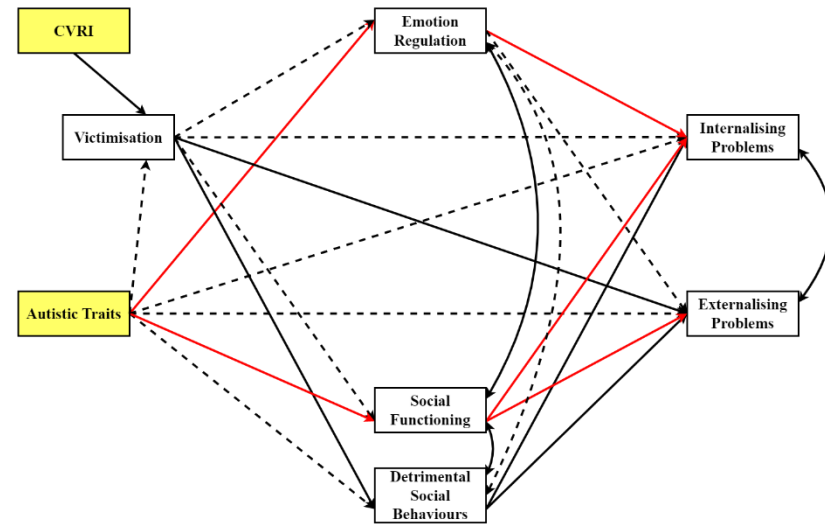
**Figure 2 (5.2)**

*SEM-I: Sibling Bullying Victimisation and Emotional Difficulties in British (B-SEM-I) and Turkish (T-SEM-I) Autistic Adolescents*

British SEM-I (B-SEM-I)



Turkish SEM-I (T-SEM-I)



Model B-SEM-I Fit:  $\chi^2(p)=.23$ , RMSEA=.03, CFI=.99, TLI=.98, CD=.51

Model T-SEM-I Fit: Saturated,  $\chi^2(p)=.57$ , RMSEA=.000, CFI=1.00, TLI=1.02, CD=.56

- Significant positive paths
- Significant negative paths
- - - - -→ Insignificant paths

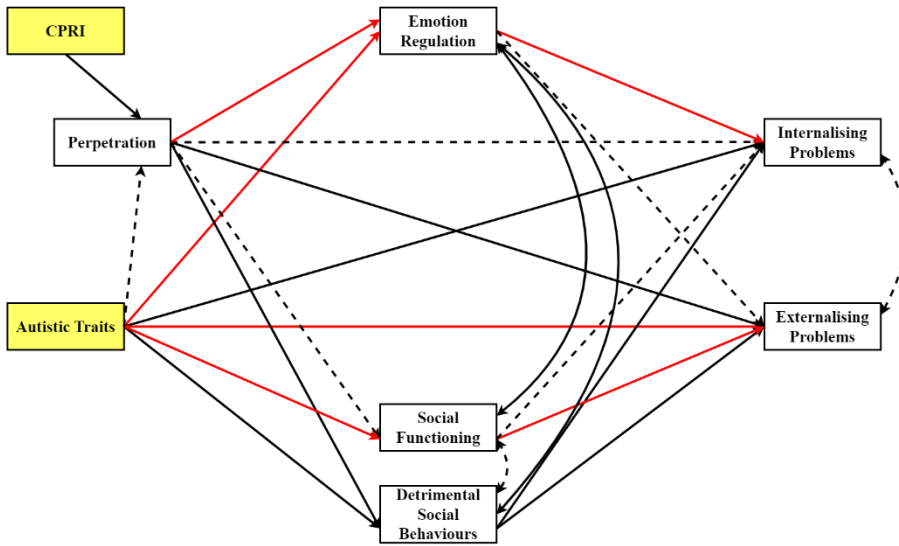




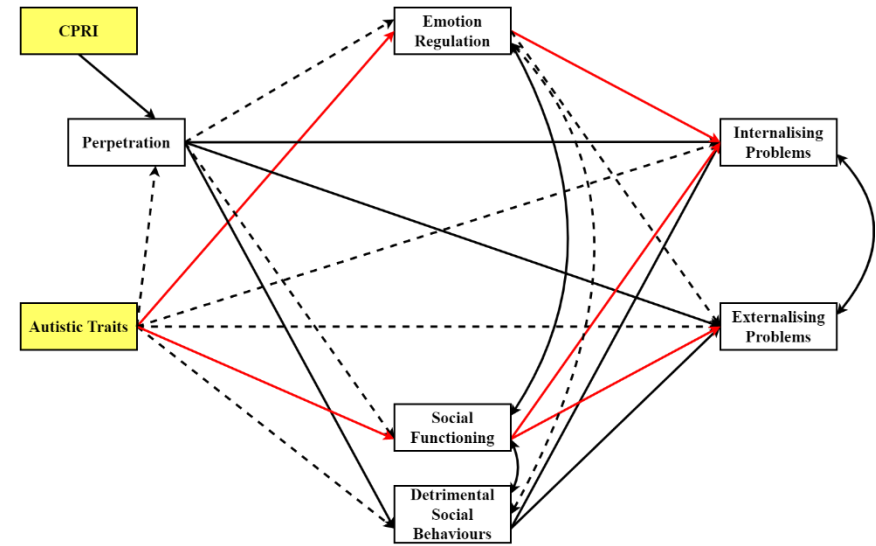
**Figure 3 (5.3)**

*SEM-II: Sibling Bullying Perpetration and Emotional Difficulties in British (B-SEM-II) and Turkish (T-SEM-II) Autistic Adolescents*

British-SEM-II (B-SEM-II)



Turkish-SEM-II (T-SEM-II)



Model B-SEM-II Fit:  $\chi^2(p)=.15$ , RMSEA=.04, CFI=.99, TLI=.97, CD=.46

Model T-SEM-II Fit:  $\chi^2(p)=.40$ , RMSEA=.01, CFI=1.00, TLI=.99, CD=.61

- Significant positive paths
- Significant negative paths
- - - - -→ Insignificant paths

## 5.4 Discussion

Using a cross-cultural sample, for the first time, the current study looked to see whether the prevalence and risk factors of sibling bullying differ between British and Turkish autistic adolescents. Additionally, the current study examined whether sibling bullying is indirectly correlated with mental health and, if so, whether its indirect associations show cross-cultural variations between British and Turkish autistic adolescents. Overall, the current findings indicate that sibling bullying is highly prevalent in the lives of British and Turkish autistic adolescents. It also found cross-cultural similarities and differences in the risk factors for sibling bullying and in the way sibling bullying relates to mental health in autistic adolescents. For instance, while increased sibling bullying was indirectly linked to poorer mental health through reduced emotion regulation in British autistic adolescents, this was not the case for the Turkish ones. However, being involved in sibling bullying was indirectly related to poorer mental health through increased detrimental social behaviours in both cultures. Cross-cultural similarities and differences are further discussed in light of the Etic approach (Kagitcibasi & Berry, 1989).

### 5.4.1 Prevalence of Sibling Bullying

The current findings showed that nearly one in two British and Turkish autistic adolescents bullied their sibling or were bullied by their sibling at least once a week. Previous reports have also indicated that about 50% of British autistic adolescents experience sibling bullying (Deniz & Toseeb, 2022; Toseeb et al., 2018, 2020b) every week, while no previous reports exist in the Turkish culture. Aligning well with the previous reports from the UK, the current findings support the notion that sibling bullying is the most common form of intra-familial violence adolescents experience in their lives (Button & Gealt, 2010), adding that it may be a common cross-cultural risk factor for autistic adolescents. Since the prevalence rates that were found on parent-reported sibling bullying in autistic families are very similar

to previous reports on autistic child self-reported sibling bullying, one might argue that there may be high agreement between child-parent report sibling bullying in families of autistic adolescents unlike the low to moderate agreement in the general population (Dantchev & Zemp, 2022). That is, parents of autistic adolescents are potentially more aware of their children's sibling bullying experiences than parents from non-autistic families.

Additionally, the current study found that the majority of autistic adolescents were involved in two-way sibling bullying as a victim and a perpetrator. This is in line with the previous work in British samples (Dantchev & Wolke, 2019; Deniz et al., 2022; Toseeb et al., 2018; Toseeb et al., 2020a, 2020b; Toseeb & Wolke, 2022). That is, the majority of Turkish and British autistic adolescents who were involved in sibling bullying were involved in two-way bullying meaning that they either initiated bullying behaviours and also retaliated bullying behaviours when bullied by their siblings. Previous researchers have suggested that autistic adolescents may be more likely to bully their non-autistic siblings potentially due to showing higher levels of aggression than their non-autistic peers and showing social communication difficulties such as misunderstanding others' intentions and behaviours (Libster et al., 2022; Nowell et al., 2014; Rowley et al., 2012). In addition, past researchers also argued that autistic children are more likely to be bullied than their non-autistic peers due to their behavioural characteristics (e.g., navigating the outside world, responding to bullying behaviours, etc.) making them the perfect victim of bullying (Humphrey & Hebron, 2015).

#### ***5.4.2 Risk Factors for Sibling Bullying***

More differences than similarities were found between British and Turkish cultures in regard to the risk factors for sibling bullying. Regarding the cross-culturally common risk factors, autistic adolescents who reported being victimised by their neurotypical siblings were at increased risk for being victimised by their siblings in the present time. Similarly,

individuals who were victimised by a sibling and who bullied a sibling in the past were more likely to experience sibling bullying later on. These findings well align with a past report as past sibling bullying experiences have been found to predict future sibling bullying involvement in autistic adolescents (Deniz & Toseeb, 2022).

In terms of cross-culturally distinct risk factors for sibling bullying, in the British culture, but not in the Turkish culture, adolescents who had an opposite-gendered sibling were at increased risk for being involved in sibling bullying than those with same-gendered siblings. Although the literature is severely limited on this, partially confirming this, a study also indicates that males are more likely to bully their female siblings than their male siblings (Menesini et al., 2010). Additionally, again aligning with previous research reports (Bowes et al., 2014; Dantchev & Wolke, 2019; Foody et al., 2020; Menesini et al., 2014; Toseeb et al., 2018), having an older male sibling is a significant risk factor for sibling bullying involvement at home for British autistic adolescents. Finally, those who were physically weaker than their siblings were at increased risk of being involved in sibling bullying. Again, this well aligns with previous reports as researchers have commonly characterised sibling bullying as a form of aggression initiated by the more powerful sibling towards the weaker sibling (Wolke et al., 2015).

In regard to distinct risk factors for sibling bullying in the Turkish culture, the current study found that high parental education is a risk factor for sibling bullying for Turkish, but not British, autistic adolescents. This is well-supported as some researchers also found higher parental education to be related to increased sibling bullying (Tippett & Wolke, 2015; Tucker et al., 2013, 2014). Since the majority of the respondents were mothers, one might argue that this may relate to the primary caregiver role of mothers in Turkey as about 94.4% of Turkish mothers take the caregiving responsibilities of their children alone (Turkiye Istatistik Kurumu, 2022). That is, an above college degree for Turkish mothers potentially means

decreased primary caregiver supervision for Turkish autistic adolescents, which is a risk factor for increased sibling bullying (Tucker et al., 2014; Wolke et al., 2015). Additionally, having a younger sibling was a risk factor for bullying a sibling for Turkish autistic adolescents. This is also supported by the existing reports as others also found that young siblings are more likely to be victims of sibling bullying (Dantchev et al., 2018; Deniz et al., 2022; Menesini et al., 2010; Toseeb et al., 2020a).

#### ***5.4.3 Direct Correlates of Sibling Bullying***

The current study found cross-culturally common and culturally distinct direct links between sibling bullying and behavioural and mental health outcomes of autistic adolescents. In regard to cross-culturally common direct links, bullying a sibling was directly associated with internalising and externalising problems in both British and Turkish autistic adolescents. This finding is well supported by previous research which drew a positive direct link between sibling bullying perpetration and poorer mental health in autistic adolescents (Deniz & Toseeb, 2022; Toseeb et al., 2018, 2020b). Additionally, sibling bullying perpetration was directly associated with increased detrimental social behaviours in British and Turkish autistic adolescents. Although this has been the first study to test this association, the relevant literature supports the current findings as sibling bullying is found to be related to decreased prosocial behaviours (Foody et al., 2020; Toseeb et al., 2018, 2020b) and increased anti-social behaviours (Dantchev & Wolke, 2019) which are likely to be correlated with detrimental social behaviours.

Looking at the culturally unique correlates of sibling bullying, being victimised by a sibling was linked to increased externalising problems in British autistic adolescents but not in Turkish ones. This finding is both supported and contradicted by the limited evidence in the literature. While a recent study found no direct correlations between sibling victimisation and internalising and externalising problems (Deniz & Toseeb, 2022), past studies indicated

positive direct correlations between sibling victimisation and externalising problems in autistic as well as general populations (Bowes et al., 2014; Coyle et al., 2017; Duncan, 1999; Liu et al., 2020; Tucker et al., 2013; Toseeb et al., 2018, 2020b). Taken together, past research indicates strong direct links between sibling victimisation and externalising problems, which was also found in the British, but not Turkish, culture in this study. Though, all this evidence comes from Western populations while little to no knowledge exists in non-Western cultures. Hence, more cross-cultural research is needed to further clarify whether being bullied by a sibling is directly correlated with externalising problems in non-westerner autistic adolescents.

Although being a victim of sibling bullying was not directly correlated with reduced emotion regulation in either culture, bullying a sibling was linked to reduced emotion regulation in British autistic adolescents, but not in Turkish ones. Not aligning with the current findings, a recent study from the United States has reported that increased sibling victimisation is associated with reduced emotion regulation in adolescents (Fite et al., 2022). However, supporting the current findings, a UK-based study has found that perpetrators, but not victims, of sibling bullying show reduced emotion regulation (Toseeb et al., 2020a). Based on the latter evidence, one might argue that bullying a sibling, but not being bullied by a sibling, may be a direct risk factor for reduced emotion regulation in British autistic adolescents. Additionally, it could be argued that sibling bullying may not be linked to emotion regulation in Turkish autistic adolescents potentially due to some unmeasured protective factors of emotion regulation that exist in the Turkish, but not in the British, culture. More research, from the Turkish culture, is needed to unpack the reason why sibling bullying is not linked to emotion regulation and what the potential protective mechanisms of emotion regulation may be.

Finally, while sibling bullying perpetration was not correlated with autistic traits, in either sample, being victimised by a sibling was negatively correlated with reduced autistic

traits in the British sample but not in the Turkish sample. That is, British autistic adolescents who had lower autistic traits were more likely to be victimised by their neurotypical siblings than those with high autistic traits. This well aligns with the previous reports as others also found that autistic individuals with fewer autistic traits are more likely to be victimised by their peers than those with high autistic traits (Libster et al., 2022; Nowell et al., 2014; Rowley et al., 2012; Zablotsky et al., 2014). Previous researchers argue that this may be due to the fact that autistic individuals who have fewer autistic traits are more able to socially interact with their peers which increases the likelihood of experiencing negative social interactions such as bullying. It is, however, unclear why this was not the case for Turkish autistic adolescents. One might argue that this may potentially be due to cross-cultural differences in sibling relationships of autistic adolescents. For instance, British children take more caregiving responsibilities and spend less time with their parents than their Turkish peers which may increase the risk of being victimised by their neurotypical sibling. This may not be the case in Turkey due to less caregiving responsibilities and more parental supervision that Turkish children get compared to their British counterparts.

#### ***5.4.4 Sibling Bullying and Mental Health: Indirect Associations***

As expected, indirect relationships were found between sibling bullying and mental health in both British and Turkish autistic adolescents with some sort of variation across cultures. For instance, increased sibling bullying, both victimisation and perpetration, was indirectly correlated with increased internalising problems through reduced emotion regulation in British autistic adolescents but not in Turkish ones. Although the literature is severely limited, this finding aligns well with previous reports where researchers found significant correlations between sibling bullying and emotion regulation and between emotion regulation and mental health (Boyes et al., 2020; Fite et al., 2022; Toseeb et al., 2020a). This indirect relationship may be explained by a previously made argument that

poorly regulated emotions may be the reason for perpetrating sibling bullying as well as a reflection of existing mental health difficulties (Toseeb et al., 2020a). Based on their argument, these researchers have also suggested that emotional dysregulation could play a mediator role in the relationship between sibling bullying and mental health, which is now confirmed in the present analyses. However, it further remained unclear why this was not the case in Turkish culture. As outlined earlier, this may be because of the existence of some factors that may have protected the emotion regulation of Turkish autistic adolescents from the detrimental impacts of sibling bullying. For now, more research is needed to support this argument and shed light on the potential protective mechanisms, if any, for emotion regulation in Turkish culture.

There were also indirect relations between sibling bullying and mental health through detrimental social behaviours. For Turkish adolescents, as expected, both being bullied by a sibling and bullying a sibling were indirectly associated with poorer mental health through increased detrimental social behaviours. For British adolescents, however, only bullying a sibling (not being bullied) was associated with poorer mental health through more detrimental social behaviours. This is well in line with previous similar reports where researchers indicated significant associations between sibling bullying, prosociality and anti-social behaviours, and mental health (Dantchev & Wolke, 2019; Foody et al., 2020; Nantel-Vivier et al., 2014; Toseeb et al., 2018, 2020b). It further remains unclear why being the victim of bullying is associated with detrimental social behaviours in Turkish autistic adolescents but not in British. One explanation for this could, possibly, be that British autistic adolescents who had high sibling bullying victimisation also had low autistic traits which are linked to increased social communication skills. Based on this, it could be argued that the detrimental impacts of being victimised by a sibling were not a risk factor for increased detrimental social behaviours in British autistic adolescents due to having low autistic traits providing them



with high social communication skills. Future research should explicitly investigate this possibility to further support the current preliminary argument on this.

#### ***5.4.5 Strengths and Limitations***

The present study has several strengths. First, it has been the first study focusing on cross-cultural variances in the prevalence and psychosocial correlates of sibling bullying in autistic adolescents. Additionally, it is the first study to investigate the indirect associations between sibling bullying and emotional difficulties through emotion regulation, social functioning, and detrimental social behaviours in autistic adolescents. Moreover, all missing data were handled, in the present analyses, which minimised potential biases in parameter estimates. Furthermore, using pre-developed and cross-culturally validated psychological measures made the results of the current study more reliable and valid. Finally, using a parent-report sibling bullying measure might be considered as another strength as parents may be better reporters of children's bullying experiences, where the sample shows high emotional symptoms, as such children may be more likely to perceive or report a higher victimisation rate than the actual rate (Bowes et al., 2014).

There are also limitations that should be borne in mind when interpreting the findings. Although using parent-report measures was defined as one strength of the study, it is important to consider that parents may as well be less aware of their children's sibling bullying experiences and, thus, may underreport sibling bullying rates as it usually happens behind closed doors (Straus et al., 2017; Wolke et al., 2015). Additionally, low to moderate agreement between parent and child reports of child mental health has been reported, that is, the parent reports may not represent the actual rates of mental health difficulties children experience (Van der Meer et al., 2008). Finally, the data used in the current study was cross-sectional, thus, causal inferences on the findings of the present study should be avoided.

#### ***5.4.6 Conclusions and Suggestions***

In summary, the present study found that sibling bullying is highly prevalent in the lives of British and Turkish autistic adolescents with more than half involved in sibling bullying, as a victim or a perpetrator, every week. Additionally, cross-cultural variations were found in the risk factors and behavioural and mental health correlates of sibling bullying between British and Turkish autistic adolescents. Moreover, sibling bullying was found to be correlated with increased internalising problems through decreased emotion regulation in British autistic adolescents but not in Turkish ones. Furthermore, sibling bullying was also indirectly linked to internalising and externalising problems through detrimental social behaviours in both British and Turkish autistic adolescents. Finally, it was found that autistic traits have a great potential to play a role in the way sibling bullying correlates to behavioural and mental health outcomes in autistic adolescents, and thus, needs to be paid attention in such analyses.

The current study followed the etic approach, which means that the current findings are solely based on the presence of cross-cultural variability in variables of interest and are not focused on or aimed at exploring the potential cultural elements underlying such cross-cultural variations. Therefore, future researchers are advised to apply the emic approach and replicate the findings of the current study by looking at the underlying reasons for the cross-cultural differences in the risk factors and correlates of sibling bullying reported in this study. Future researchers may also consider focusing on self-reported sibling bullying and mental health, as parents are often unaware of their children's sibling bullying experiences and internalising problems which may have led to under-reported sibling bullying and internalising problems in the present study.

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## Chapter 6: Study III: A Longitudinal Study of Sibling Bullying and Mental Health in Autistic Adolescents: The Role of Self-esteem

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### **Abstract**

Sibling bullying is associated with poor mental health in autistic adolescents. The reasons for this remain unknown. The current study attempted to replicate the existing findings on the direct associations between sibling bullying and mental health in autistic adolescents and expand knowledge by focusing on the indirect associations through self-esteem. For this, the current study made use of existing data from the Millennium Cohort Study, a nationally representative UK-based birth cohort study. A mediation model was fitted to longitudinal data from a sample of 416 autistic adolescents aged 11, 14, and 17 years old who had at least one sibling. Findings indicated that sibling bullying was prevalent in the lives of autistic adolescents, especially in those who were late-diagnosed, had a shared bedroom, and lived in a low-income household. Additionally, increased sibling bullying in early adolescence was a significant predictor of reduced self-esteem in mid-adolescence; in turn, reduced self-esteem predicted poorer mental health and wellbeing in late adolescence. The current findings indicate that sibling bullying in early adolescence may indirectly lead to poorer mental health and wellbeing in late adolescence through a reduction in self-esteem in mid-adolescence in autistic adolescents. Implications of these findings are discussed further.

### **Lay Summary**

Sibling bullying is prevalent in the lives of autistic adolescents and is shown to be associated with poor mental health. However, no previous research has investigated whether sibling bullying directly or indirectly predicts mental health difficulties. The current findings suggested that about 40% of autistic adolescents experienced sibling bullying at least once a week. In addition, the current findings indicate that being involved in sibling bullying indirectly increases the mental health difficulties of autistic adolescents by reducing their self-esteem.

**Keywords.** Autism, sibling bullying, self-esteem, mental health, wellbeing.

## 6.1 Introduction

Sibling relationships of autistic children are characterised by both positive and negative interactions. On the positive side, such siblings are reported to have less conflict and longer stability in their closeness as they age compared to non-autistic child families (Kaminsky & Dewey 2001; Orsmond et al. 2009). On the negative side, however, higher aggressive and disruptive behaviours have been observed among siblings in families of autistic children compared to other families (Mascha & Boucher, 2006). Such negative sibling relationships are likely to also include rivalry, jealousy, conflict, aggression, and bullying (Caspi, 2011; Edwards et al., 2006). Although rivalry, jealousy, and conflict are seen as normative parts of daily sibling interactions, consistent and frequent sibling conflict may lead to bullying which is a psychologically harmful form of violence (Olweus, 1984).

Sibling bullying is a form of intra-family violence. It is defined as frequent and repeated aggressive behaviours that intend to harm the weaker sibling physically, verbally, socially, or psychologically (Wolke et al., 2015). Sibling bullying is potentially the most prevalent form of violence in children's and adolescents' lives as nearly 50% report having been involved in sibling bullying, either as a bully, victim, or both (Deniz et al., 2022; Duncan, 1999; Toseeb et al., 2018; Wolke et al., 2015). Although sibling bullying has been found to be highly prevalent in both Western and non-western cultures, interestingly, reports from some countries, such as China, indicated lower rates of sibling bullying (10-20%) than the high prevalence in other countries (Liu et al., 2021 Peng et al., 2022; Qing et al., 2022). This indicates that there may be culture-level risk and protective factors of sibling bullying.

Some individual and family-level risk factors have been shown to be associated with sibling bullying. For example, individuals who are White, female, first-born, have a male sibling, have two or more siblings, and live in poverty are more likely to be victims of sibling bullying than those who are non-White, male, with no male sibling, have one only sibling,

and live in high-income families (Bowes, 2014; Dantchev et al., 2018; Dantchev & Wolke, 2019a; Eriksen & Jensen, 2009; Liu et al., 2021; Menesini et al., 2010; Tippett & Wolke, 2015; Toseeb et al., 2018). Although having an older male sibling is suggested as a risk factor for sibling bullying (Bowes, 2014; Menesini et al., 2010), contradicting evidence also exists as Duncan (1999) reports that females are either equally or more likely to be perpetrators of sibling bullying compared to males. Hence, more research is needed to shed light on the interaction between sex and sibling bullying. Additionally, most of the evidence, in regard to individual and family-level precursors of sibling bullying, comes from the general population, therefore, more research is needed to test whether they apply to the autistic population.

Until recently, mental illness and wellbeing were considered two psychological constructs representing opposite ends of a linear spectrum. Recently, however, researchers have begun to draw a dividing line between mental illness and wellbeing, arguing that while they may be highly related, one does not mean the absence of the other (Keyes, 2005). Supporting this, the United Kingdom Department of Health (2014) published a report suggesting that mental illness and wellbeing are two distinct phenomena and that mental wellbeing is not simply the absence of mental illness. Additionally, using UK-based representative population cohort data, researchers have shown weak correlations between mental health difficulties and wellbeing (Patalay & Fitzsimons, 2016). They have also noted that mental illness and well-being have drastically different correlates, suggesting that these two terms should not be considered as ends of the same continuum, but as two separate, though related continua. Consistent with the recent trend, in this study, on the one hand, the term mental health is used to refer to individuals' internalising (i.e., emotional difficulties and peer problems) and externalising problems (i.e., conduct problems and hyperactivity/inattention) while on the other hand, well-being covers two main concepts:

*hedonic* (e.g., feeling good, subjective well-being) and *eudaimonic* (e.g., positive functioning) wellbeing (Clarke et al., 2010).

Self-esteem is briefly defined as a person's summary judgement of their own worth (Bailey II, 2003) and seems to be highly related to life satisfaction (Diener & Diener, 1995) and meaning in life (Steger et al., 2006). Previous studies, in the general and autistic populations, have shown that high levels of self-esteem are significantly correlated with low levels of mental health difficulties (McCauley et al., 2019; Moksnes & Reidunsdatter, 2019; van der Crujisen & Boyer, 2021) and high levels of wellbeing (Corden et al., 2021; Mazurek, 2014; Moksnes & Reidunsdatter, 2019). However, the strong correlations between self-esteem and mental health and wellbeing do not indicate a causal relation. For instance, correlations between self-esteem and mental health and wellbeing appeared to be non-significant upon controlling for individual and family characteristics (Boden et al., 2008). On this, some researchers suggest that self-esteem is not part of mental health or wellbeing, but it is rather a potential correlate of both psychological constructs (Orth et al., 2012). As such, self-esteem has repeatedly been tested as a mediator factor in the associations between various predictor factors and mental health and wellbeing outcomes (Kurtović et al., 2018; Lee et al., 2013; Urzúa et al., 2018). Hence, in the present study, self-esteem is considered a distinct construct that potentially relates to both mental health and wellbeing, but it is not necessarily an indicator of either psychological phenomenon.

There is a link between sibling bullying and mental health and wellbeing in the general population. Sibling bullying is associated with high levels of anxiety and depression (Bowes, 2014; Duncan, 1999; Liu et al., 2020), psychological distress and self-harm (Wolke et al., 2015), internalising and externalising problems (Buist & Vermande, 2014; Coyle et al., 2017; Tucker et al., 2013), and poor wellbeing (Toseeb & Wolke, 2021). These associations between sibling bullying and mental health and wellbeing appear to be comparable

irrespective of the sibling bullying role (i.e., the victim or the bully) (Toseeb & Wolke, 2021). Therefore, there is an abundance of evidence demonstrating a link between sibling bullying and mental health and wellbeing in the general population.

Although autistic children are more likely to be involved in sibling bullying than non-autistic children (Toseeb et al., 2018), only a handful of research has focused on the associations between sibling bullying and mental health and wellbeing in autistic individuals. Autistic adolescents who are involved in sibling bullying in early adolescence show more internalising and externalising problems in early- and mid-adolescence, compared to those who are not involved in sibling bullying (Toseeb et al., 2018, 2020a). Irrespective of bullying roles (i.e., victim-only, bully-only, bully-victim), autistic adolescents who are involved in sibling bullying show greater internalising problems than non-involved ones. However, autistic adolescents who are perpetrators of bullying (bully-only) show significantly higher externalising problems than victims and bully-victims (Toseeb et al., 2020a). No study to date has investigated the associations between sibling bullying in early adolescence and mental health and wellbeing in late adolescence in autistic adolescents. Therefore, the long-term implications of sibling bullying on the mental health and wellbeing of autistic adolescents remain unclear.

Studies on sibling bullying and self-esteem in the general population are scarce. In one study, sibling violence was associated with lower levels of self-esteem in Singaporean youths (Gan & Tang, 2020). Nevertheless, the study findings relied on retrospective reporting of sibling violence from samples of youths aged 18-25 years old. This does not tell us much about the associations during early- and mid-adolescence. Additionally, a UK-based longitudinal study found that consistently high sibling bullying victimisation at age 11 years predicted lower levels of self-esteem at age 14 years (Sharpe et al., 2021). In the same sample, adolescents who were either victims or bully-victims of sibling bullying at age 11



years had lower self-esteem at age 17 years compared to non-involved adolescents (Toseeb & Wolke, 2021). These findings suggest that sibling bullying in early adolescence, irrespective of the bullying role, is associated with lower levels of self-esteem in mid-and late-adolescence. However, there has been no systematic investigation of the longitudinal association between sibling bullying and self-esteem in autistic adolescents.

### ***6.1.1 The Current Study***

Previous studies suggest direct links between sibling bullying and self-esteem; sibling bullying and mental health and wellbeing; and self-esteem and mental health and wellbeing (e.g., Sharpe et al., 2021; Toseeb et al., 2020a; van der Crujisen & Boyer, 2021). Although no evidence exists in the sibling bullying literature, two recent studies have suggested that self-esteem is a significant mediator in the associations between peer victimisation and mental health in Chinese children and adolescents (Zhong et al., 2021; Yang et al., 2022). The strong correlation between sibling and peer bullying (Wolke et al., 2015) points out that self-esteem may as well be a significant mediator between sibling bullying and mental health and wellbeing. Despite this, no study to date has tested whether self-esteem is a significant mediator in the associations between sibling bullying and mental health in either the general or autistic population. Thus, the question of whether sibling bullying is an indirect correlate, through self-esteem, of poor mental health and wellbeing has remained unanswered.

The existing literature suggests that different types of sibling bullying (i.e., victimisation and perpetration) are differently correlated with self-esteem and mental health and wellbeing in adolescents, though the existing evidence is inconsistent. For instance, a recent study on autistic adolescents suggests that bullies of sibling bullying show greater externalising problems than victims or bully-victims of sibling bullying (Toseeb et al., 2020a). A recent study in the general population, however, indicates that victims or bully-victims of sibling bullying show poorer mental health and wellbeing than bullies of sibling

bullying (Toseeb & Wolke, 2021). Further evidence, from the general as well as the autistic population, demonstrates that different types of sibling bullying involvement (i.e., victimisation and perpetration) exert different effects on the mental health of those involved (Bowes et al., 2014; Dantchev & Wolke, 2019b; Toseeb et al., 2018, 2020a). No studies to date have tested the associations between different types of sibling bullying and wellbeing in autistic adolescents.

Although there has been growing interest in researching sibling bullying and its correlates, the existing evidence comes primarily from the general population, while little knowledge exists in the autistic population. Additionally, the nature of the associations between sibling bullying and mental health and wellbeing (i.e., direct or indirect) has remained unknown. Finally, it is not yet clear how differing types of sibling bullying involvement (i.e., victimisation and perpetration) correlate with mental health and wellbeing in autistic adolescents. To address this knowledge gap, the current study aimed to 1) report the prevalence and individual – and family-level correlates of sibling bullying, 2) test the potential mediator role of self-esteem in mid-adolescence in the longitudinal associations between sibling bullying in early adolescence and mental health and wellbeing in late adolescence, and 3) report whether the associations between sibling bullying and mental health and wellbeing differ based on the type of sibling bullying involvement (i.e., sibling bullying victimisation and sibling bullying perpetration) in autistic adolescents. In doing so, the current study proposes the following research questions and hypotheses:

### **Research Questions**

RQ1: What is the prevalence of sibling bullying in autistic adolescents?

RQ2: What are the individual – and family-level correlates of sibling bullying in autistic adolescents?

RQ3: Does sibling bullying in early adolescence directly predict mental health and wellbeing in late adolescence?

RQ4: Does sibling bullying in early adolescence directly predict self-esteem in mid-adolescence?

RQ5: Does self-esteem in mid-adolescence directly predict mental health and wellbeing in late adolescence?

RQ6: Does self-esteem mediate the associations, if any, between sibling bullying in early adolescence and mental health and wellbeing in late adolescence?

RQ7: Do different types of sibling bullying experiences, victimisation and perpetration, correlate differently with mental health and wellbeing in late adolescence in autistic adolescents?

### **Hypotheses**

H<sub>1</sub>: Autistic adolescents with higher rates of sibling bullying in early adolescence would show poorer mental health and wellbeing in late adolescence compared to those with lower rates of sibling bullying in early adolescence.

H<sub>2</sub>: Autistic adolescents with higher rates of sibling bullying in early adolescence would show lower levels of self-esteem in mid-adolescence compared to those with lower rates of sibling bullying in early adolescence.

H<sub>3</sub>: Higher rates of self-esteem in mid-adolescence would be associated with better mental health and wellbeing in late adolescence in autistic adolescents.

H<sub>4</sub>: Self-esteem in mid-adolescence would significantly mediate the longitudinal associations between sibling bullying in early adolescence and mental health and wellbeing in late adolescence in autistic adolescents.

## 6.2 Methods

### 6.2.1 Ethics Statement

The current study made use of existing data from the Millennium Cohort Study (MCS), which were accessed through the UK Data Service (2020). The MCS is a nationally representative UK-based cohort study. In the MCS, children born between 2000 and 2002, and their families, were recruited to the study when the children were 9 months old and subsequently followed at ages 3, 5, 7, 11, 14, and 17 years. Local ethical approval for data collection was granted by relevant ethics committees (Full details are available [here](#)).

### 6.2.2 Sampling Autistic Adolescents

For the analyses reported here, primarily, data collected during adolescence (11, 14, and 17 years of age) were used. However, demographic information from the earlier waves was also used to determine sample demographics. Data from ages 11, 14, and 17 years were merged yielding 13,234 unique observations. The three-wave data sets were then labelled as follows: early adolescence (T1) when adolescents were 11 years old, mid-adolescence (T2) when they were 14 years old, and late adolescence (T3) when they were 17 years of age.

When the child was 5, 7, 11, and 14 years old, parents were asked: “Has a doctor or other health professional ever told you that your child had autism, Asperger’s syndrome, or other autistic spectrum disorder?”. Those individuals whose parents responded yes at any one of the time points were identified as autistic. This yielded a sample of 450 autistic adolescents. Those without any siblings at ages 11 and 14 were removed (n=34) which yielded an overall sample of 416 eligible autistic adolescents.

### 6.2.3 Measures

**Sibling Bullying.** At age 11 (T1) and 14 years (T2), adolescents self-reported their sibling bullying experiences by responding to a two-item sibling bullying questionnaire

(SBQ): (1) “How often do you hurt or pick on your brothers or sisters on purpose?”, and (2) “How often do your brothers or sisters hurt you or pick on you on purpose?”. The SBQ is a six-point Likert-type scale scored as follows: *0=never, 1=less often, 2=every few months, 3=about once a month, 4=about once a week, 5=most days*. In the SBQ, these two items were combined to generate a sibling bullying variable in which higher scores mean increased rates of sibling bullying. Additionally, a well-accepted cut-off value, *about once a week* (Dantchev et al., 2019; Deniz et al., 2022), was specified to report the prevalence of sibling bullying. That is, participants who were victimised by a sibling or those who bullied a sibling at least once a week were categorised as *involved* in sibling bullying. The Cronbach’s alpha values for the sibling bullying measure were good at two-time points (T1  $\alpha=.77$ ; T2  $\alpha=.80$ ).

**Self-esteem.** In the MCS, participants’ self-esteem was measured using the five-item (positively worded) version of the Rosenberg Self-Esteem scale (RSE; Rosenberg, 1965). The adolescents self-reported their self-esteem on a four-point scale (*0=strongly disagree, 1=disagree, 2=agree, 3=strongly agree*). The items were: (1) “I feel that I am a person of worth, at least on an equal plane with others”, (2) “I feel that I have a number of good qualities”, (3) “I am able to do things as well as most other people”, (4) “I take a positive attitude toward myself.”, (5) “On the whole, I am satisfied with myself”. Overall self-esteem scores were generated by summing the responses to all items ranging from zero to 15 with higher scores indicating higher levels of self-esteem. The RSE had good to high internal consistency at both time points (T1  $\alpha=.75$ ; T2  $\alpha=.89$ ).

**Mental Health.** When the adolescents were 17 years old (late adolescence), internalising and externalising problems were measured using the self-report Strength and Difficulties Questionnaire (SDQ; Goodman, 1997). The SDQ is a widely used mental health screen. Responses to 20 items are answered on a three-point scale (*0=not true, 1=somewhat true, and 2=certainly true*); higher scores indicated increased mental health difficulties. The

items are divided into four subscales; emotional problems, peer problems, conduct problems, and hyperactivity. In line with the scoring guidelines ([sdqinfo.org](http://sdqinfo.org)), emotional problems and peer problems subscales were combined to create an internalising problems scale. Similarly, conduct problems and hyperactivity subscales were summed to create an externalising problems scale. The SDQ showed excellent internal reliability ( $\alpha=.82$ ).

**Wellbeing.** The Short Warwick-Edinburgh Mental Wellbeing Scale (S-WEMWBS; Tennant et al., 2007) was used to measure the wellbeing of adolescents when they were 17 years old (T3). The S-WEMWBS is a well-validated, reliable, and self-report instrument to assess the mental wellbeing of adolescents. The S-WEMWBS is a five-point Likert-type scale (*1=none of the time, 2=rarely, 3=some of the time, 4=often, 5=all of the time*) that consists of the following items: (1) “I have been feeling optimistic about the future”, (2) “I have been feeling useful”, (3) “I have been feeling relaxed”, (4) “I have been dealing with problems well”, (5) “I have been thinking clearly”, (6) “I have been feeling close to other people”, (7) “I have been able to make up my own mind about things”. Responses to the items were summed to generate a total wellbeing score with higher scores indicating greater wellbeing. In addition, the total test score of the 7-item S-WEMWBS was re-coded and adjusted to the 14-item test score to better reflect participants’ wellbeing according to metrics provided in the scale’s user guide (Stewart-Brown & Janmohamed, 2008). Detailed information regarding S-WEMWBS raw-score transformation can be found in Table S1 (Supplementary materials). In the present study, the S-WEMWBS had excellent internal consistency reliability ( $\alpha=.80$ ). Given that the score transformation is made at the scale level, not the item level, the internal consistency of the S-WEMWEBS is reported on the original scale.

#### **6.2.4 Covariates**

Potential covariates of sibling bullying were defined based on the existing empirical evidence and the availability of such variables in the MCS. More specifically, ethnicity, sex, number of siblings, birth order, and family income, have previously been found to be significant correlates of sibling bullying (Bowes, 2014; Dantchev et al., 2018; Dantchev & Wolke, 2019a; Eriksen & Jensen, 2009; Liu et al., 2021; Menesini et al., 2010; Tippett & Wolke, 2015; Toseeb et al., 2018). Hence, these variables were added as potential covariates of sibling bullying. Although no previous study has tested this, the current study also looked to see whether having a shared bedroom is a risk factor for sibling bullying, given that researchers have suggested that increased time spent together with limited personal space increases sibling conflict (Toseeb, 2022). These variables were also tested as potential covariates of other model variables (i.e., self-esteem, internalising and externalising problems, and wellbeing) if significant bivariate correlations were found.

At various time points, primary caregivers were asked to report a range of demographic information, such as the cohort member's ethnicity (0=Non-White, 1=White), sex (0=Female, 1=Male), number of siblings (0= One-only sibling, 1= Two or more siblings), and whether they had their own bedroom (0=No, 1=Yes). They also reported the family income (0= Above average OECD, 1= Below average OECD). Although not measured directly, birth order and late autism diagnosis variables were derived based on relevant reported information in the dataset:

***Birth Order.*** When the child was 9 months old, parents were asked to report the number of siblings their child had. Based on this, children were labelled as “first-born” if they had no siblings at 9 months of age and “second or later born” if they had at least one.

***Late Diagnosis.*** When the child was 5, 7, 11, and 14 years old, parents were asked whether their child was diagnosed with autism by a doctor or other health professional.

Adolescents were categorised as late diagnosed if their parent responded “No” when they were aged 5 years old, and “Yes” at any later time point (7, 11, or 14).

### **6.2.5 Statistical Analyses**

The main aims of the analyses presented in this study were to: a) report the prevalence and demographic correlates of sibling bullying, b) explore the correlations between sibling bullying and mental health and wellbeing, and c) test the mediator role of self-esteem in the associations between sibling bullying and negative and positive mental health. All statistical analyses were conducted on STATA/ MP 17 (Stata Corp., 2019).

First, descriptive statistics were produced to report the characteristics of the sample and the prevalence of sibling bullying. All descriptive statistics were performed on the multiply imputed data set using the *mi estimate* command. Second, Point Biserial (PBIS) correlation was used to determine the bivariate correlations among dummy coded demographic characteristics and discrete model variables (e.g., sibling bullying). Based on the PBIS matrix, the significant correlates of interest variables were identified as control covariates of interest variables in the proposed mediation model. Third, due to the non-normal distribution in some interest variables, Spearman’s correlation coefficient was used to report the zero-order correlations between sibling bullying and other model variables (i.e., self-esteem, internalising and externalising problems, and wellbeing). Fourth, a structural equation model (SEM) was fitted to test the direct and indirect effects of sibling bullying on mental health and wellbeing. Indirect effects were reported using the MEDSEM package in STATA (Mehmetoglu, 2018). A Monte Carlo simulation was fitted to replicate the MEDSEM findings on randomly generated samples (N=5000) to correct potential biases in parameter estimations.

**Sensitivity Analyses.** In the current study, the main analyses tested the mediating role of self-esteem in the associations between sibling bullying and mental health and wellbeing.



However, the current study also aimed to test whether different types of sibling bullying involvement, sibling bullying victimisation, sibling bullying perpetration, and overall sibling bullying, correlate differently with self-esteem, mental health, and wellbeing in autistic adolescents. For this, sensitivity analyses were conducted by replacing the overall sibling bullying (i.e., victimisation and perpetration combined) predictor variable with victimisation and perpetration. Any differences in the direct and indirect correlations, as well as in the mediation results are reported alongside the main model.

**Missing Data.** Prior to handling missing data, the missingness pattern in the dataset was evaluated to test whether the prerequisites for handling missing data were met. According to Rubin (2004), missing data can be handled if the missingness pattern in the dataset is missing at random (MAR), meaning that the missingness is not predicted by observed values in interest variables. For this, a binary variable *missingness pattern* (0=No missing values, 1=At least 1 missing value in any observation) was constructed. Furthermore, a multiple logistic regression analysis was conducted to test whether this variable – missingness pattern – was predicted by observed values in demographics (i.e., gender, ethnicity) or model variables (i.e., sibling bullying, self-esteem, mental health, wellbeing). The logistic regression indicated that the missingness pattern in the dataset was not predicted by any observed values in the demographic or interest variables. Detailed information regarding the missing at-random test can be seen in Table S2 (Supplementary materials).

Upon exploration of the missingness pattern in the dataset (MAR), missing values were handled using two advanced statistical techniques: multiple imputations by chained equations (MICE) and maximum likelihood with missing values (MLMV). In fitting MICE, predictive mean matching (PMM) was used to generate 50 multiply imputed datasets following a pre-made suggestion that “the number of imputed datasets (m) should be greater than the highest proportion of missingness” in interest variables (Van Buuren, 2018). The

PMM was chosen over the regress method, as the regress option produced imputations outside scale ranges (e.g., negative values). Following this, the multiply imputed datasets were used to report descriptive statistics. Finally, the full information maximum likelihood (FIML) algorithm was used in the SEM analyses to handle missing values and maximise the sample power. More information regarding the number of missing and imputed values in interest variables is outlined in Table S3 (Supplementary materials).

## **6.3 Results**

### ***6.3.1 Sample Characteristics***

At time 1, the mean age of the participants was 11.20 years, 88% were White, 78% were males, 59% were second or later-born (had at least one older sibling), 53% had two or more siblings, 69% had their own bedroom, 80% had a late autism diagnosis, and 34% were from low-income households. Overall, 62% of autistic adolescents self-reported being involved in sibling bullying at least once a week in early adolescence. Of these, 40% bullied their siblings, while 58% were victimised by their siblings. In addition, most autistic adolescents, who were involved in sibling bullying, were bully-victims (59%), while far fewer were victim-only (35%) or bully-only (6%). More information regarding sibling bullying roles by demographic characteristics can be seen in Table S4 (Supplementary materials).

### ***6.3.2 Demographic Correlates of Interest Variables***

Point biserial correlations (see Table 1) indicated that participants who were late-diagnosed had a shared bedroom, and lived in a low-income household were more likely to be involved in sibling bullying than those who were early diagnosed, owned a bedroom, and lived in a high-income household. Although no other demographics were associated with sibling bullying, some demographics were correlated with other interest variables. For example, autistic adolescents who were White, female, early-diagnosed, and had an older

sibling had lower self-esteem than others. Additionally, those who were White, female, early-diagnosed, and lived in low-income households had poorer mental health and wellbeing than those who were non-White, male, late-diagnosed, and lived in high-income households. More details can be found in Table 1.

Prior to the test of the mediation, the current study looked to see whether the pre-hypothesised model meets the pre-existing mediation conditions (i.e., significant path a and path b) by testing zero-order correlations between the interest variables (see Table 2). Spearman's correlation matrix showed significant associations between sibling bullying in early adolescence and self-esteem in mid-adolescence (path a), and between self-esteem in mid-adolescence and mental health and wellbeing in late adolescence (path b). There were, however, no concurrent associations between sibling bullying and self-esteem in early adolescence, while they were significantly and negatively correlated in mid-adolescence. Additionally, lower levels of self-esteem in early adolescence increased the risk for sibling bullying involvement in mid-adolescence. These findings confirmed that the pre-hypothesised model met the pre-determined mediation conditions.

**Table 1 (6.1)**

*Point Biserial Correlations between the Potential Covariates and Interest Variables (N=416)*

	Mean	Std. dev.	Sibling Bullying (T1)	Self-esteem (T2)	Internalising Problems (T3)	Externalising Problems (T3)	Wellbeing (T3)
Ethnicity	.88	.32	.09	<b>-.15**</b>	.07	<b>.11*</b>	-.07
Sex	.78	.41	-.03	<b>.30***</b>	<b>-.31***</b>	-.05	.01
Late diagnosis	.81	.38	<b>.14**</b>	<b>.13**</b>	<b>-.05</b>	<b>-.15**</b>	<b>.10*</b>
Birth order	.59	.49	-.01	<b>-.14**</b>	.08	-.04	-.08
Number of siblings	.53	.49	.07	.04	.01	.01	-.02
Own bedroom	.68	.46	<b>.11*</b>	-.01	.07	.04	.06
Family income	.33	.47	<b>.11*</b>	-.02	<b>.18***</b>	<b>.11*</b>	<b>-.13**</b>

Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . Ethnicity: 0=Non-White, 1=White; Sex: 0=Female, 1=Male; Late diagnosis: 0=No, 1=Yes; Birth order: 0= First-born, 1= Second-or later-born; Number of siblings: 0= One-only sibling, 1= Two or more siblings; Own bedroom: 0= No, 1= Yes; Family income: 0= Above average OECD, 1= Below average OECD. Positive values indicate higher rates of sibling bullying, increased internalising and externalising problems, and better self-esteem and wellbeing.

**Table 2 (6.2)**

*Zero-order Correlations between the Interest Variables (Spearman's  $R_s$ ,  $N=416$ )*

	1	2	3	4	5	6	7
1- Sibling Bullying (T1)	–						
2- Sibling Bullying (T2)	<b>.42***</b>	–					
3- Self-Esteem (T1)	.01	<b>-.11*</b>	–				
4- Self-Esteem (T2)	<b>-.22***</b>	<b>-.21***</b>	<b>.44***</b>	–			
5- Internalising Problems (T3)	-.01	<b>.25***</b>	<b>-.14**</b>	<b>-.29***</b>	–		
6- Externalising Problems (T3)	<b>.24***</b>	<b>.41***</b>	<b>-.20***</b>	<b>-.35***</b>	<b>.42***</b>	–	
7- Wellbeing (T3)	-.08	<b>-.27***</b>	<b>.20***</b>	<b>.38***</b>	<b>-.47***</b>	<b>-.50***</b>	–
Mean	5.18	3.81	16.27	15.49	7.61	7.37	21.17
Standard deviation	3.29	2.94	2.39	2.56	3.01	3.07	3.32

Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . Higher scores indicate higher rates of sibling bullying, increased internalising and externalising problems, and better self-esteem and wellbeing.

### 6.3.3 Path Analyses

Upon meeting the pre-determined mediation conditions, the hypothesised mediation model was tested with the significant demographic covariates of interest variables (see Table 1). The model was also controlled for individuals' pre-existing self-esteem levels (early adolescence). The aim of the latter was to test whether individuals' self-esteem in mid-adolescence is predicted by their pre-existing self-esteem levels or their sibling bullying experiences. This study attempted to control the model for sibling bullying in mid-adolescence, however, this created a suppression effect and an inconsistent mediation due to

sibling bullying in mid-adolescence acting as a reversed signed second mediator alongside self-esteem in mid-adolescence. To overcome this suppression effect, sibling bullying in mid-adolescence was later removed from the model, as it was not a variable of interest in the originally proposed mediation model. The pre-hypothesised SEM, which controlled for significant covariates, as well as self-esteem in early adolescence, provided a good model fit and explained a significantly large proportion of variance in the dependent variables:  $\chi^2(38) = 40.38$ ,  $\chi^2(p) = .365$ , RMSEA = 0.012, CFI = 0.99, TLI = 0.99, CD = 0.63.

The SEM path analysis (see Table 3) showed that increased sibling bullying in early adolescence was significantly and directly associated with reduced self-esteem in mid-adolescence. Additionally, reduced levels of self-esteem in mid-adolescence were significantly and directly correlated with increased internalising and externalising problems and decreased wellbeing in late adolescence. Finally, internalising and externalising problems were concurrently and positively associated, both of which, in turn, were negatively correlated with wellbeing in late adolescence. That is, autistic adolescents with high levels of internalising problems in late adolescence showed high externalising problems and poor wellbeing in late adolescence, and vice versa. Sibling bullying in early adolescence was not a direct correlate of internalising and externalising problems or wellbeing in late adolescence in autistic adolescents. Additionally, lower levels of self-esteem in early adolescence were not directly associated with higher internalising and externalising problems or poorer wellbeing in late adolescence. That is, sibling bullying and self-esteem may not have prolonged direct effects on the mental health and wellbeing of autistic adolescents.

The Sobel test (see Table 4) suggested that, instead of a direct link, there may be an indirect link between sibling bullying and internalising and externalising problems and wellbeing in autistic adolescents. More specifically, the mediation analysis indicated that sibling bullying in early adolescence was indirectly linked to increased internalising and

externalising problems and wellbeing in late adolescence through a reduction in self-esteem in mid-adolescence in autistic adolescents. All mediations were complete, that is, self-esteem fully mediated the associations between sibling bullying in early adolescence, mental health and wellbeing in late adolescence in autistic adolescents. The mediation model is illustrated in Figure 1.

**Table 3 (6.3)**

*SEM Paths (N=415)*

Standardised	$\beta$	SE	z	p	95% CI
<b>Direct Pathways</b>					
Sibling Bullying (T1) → Sibling Bullying (T2)	<b>.39</b>	.05	7.38	<b>&lt;.001</b>	.28, .49
Sibling Bullying (T1) → Self-Esteem (T2)	<b>-.16</b>	.05	-2.92	<b>.004</b>	-.26, -.05
Sibling Bullying (T1) → Internalising Problems (T3)	-.19	.09	-2.04	<b>.041</b>	-.38, -.01
Sibling Bullying (T1) → Externalising Problems (T3)	.02	.08	0.27	.787	-.14, .19
Sibling Bullying (T1) → Wellbeing (T3)	.06	.07	0.91	.365	-.07, .20
Sibling Bullying (T2) → Internalising Problems (T3)	<b>.21</b>	.10	2.12	<b>.034</b>	.02, .40
Sibling Bullying (T2) → Externalising Problems (T3)	<b>.34</b>	.08	4.03	<b>&lt;.001</b>	.18, .51
Sibling Bullying (T2) → Wellbeing (T3)	<b>-.19</b>	.07	-2.69	<b>.007</b>	-.32, -.05
Self-Esteem (T1) → Self-Esteem (T2)	<b>.39</b>	.05	7.70	<b>&lt;.001</b>	.29, .49
Self-Esteem (T1) → Sibling Bullying (T2)	-.09	.06	-1.63	.104	-.21, .02
Self-Esteem (T1) → Internalising Problems (T3)	-.02	.10	-0.17	.864	-.22, .18
Self-Esteem (T1) → Externalising Problems (T3)	-.06	.09	-0.74	.462	-.24, .11
Self-Esteem (T1) → Wellbeing (T3)	.01	.07	0.13	.897	-.14, .16
Self-Esteem (T2) → Internalising Problems (T3)	<b>-.30</b>	.10	-3.05	<b>.002</b>	-.49, -.10
Self-Esteem (T2) → Externalising Problems (T3)	<b>-.27</b>	.08	-3.30	<b>&lt;.001</b>	-.43, -.11
Self-Esteem (T2) → Wellbeing (T3)	<b>.30</b>	.07	4.56	<b>&lt;.001</b>	.17, .44
<b>Concurrent Associations</b>					
Sibling Bullying (T2) ↔ Self-Esteem (T2)	-.10	.06	-1.65	.098	-.22, .02
Externalising Problems (T3) ↔ Wellbeing (T3)	<b>-.46</b>	.07	-6.45	<b>&lt;.001</b>	-.61, -.32
Internalising Problems (T3) ↔ Wellbeing (T3)	<b>-.56</b>	.10	-5.25	<b>&lt;.001</b>	-.78, -.35
Externalising Problems (T3) ↔ Internalising Problems (T3)	<b>.82</b>	.15	5.65	<b>&lt;.001</b>	.54, 1.11
<b>Covariates</b>					
Ethnicity → Sibling Bullying (T1)	.08	.06	1.49	.137	-.03, .20
Late Diagnosis → Sibling Bullying (T1)	<b>.13</b>	.06	2.22	<b>.026</b>	.01, .24
Own Bedroom → Sibling Bullying (T1)	<b>-.11</b>	.05	-2.03	<b>.042</b>	-.21, -.01
Family Income → Sibling Bullying (T1)	.10	.05	1.85	.064	-.01, .21
Sex → Self-Esteem (T2)	<b>.24</b>	.05	5.01	<b>&lt;.001</b>	.15, .34
Birth order → Self-Esteem (T2)	<b>-.15</b>	.05	-2.77	<b>.006</b>	-.25, -.04
Sex → Internalising Problems (T3)	<b>-.26</b>	.07	-4.99	<b>&lt;.001</b>	-.51, -.22
Family income → Internalising Problems (T3)	<b>.24</b>	.08	2.80	<b>.005</b>	.07, .41
Family income → Externalising Problems (T3)	.09	.07	1.24	.215	-.05, .24
Ethnicity → Externalising Problems (T3)	.02	.07	0.35	.725	-.11, .16
Family income → Wellbeing (T3)	<b>-.13</b>	.06	-2.13	<b>.033</b>	-.24, -.01

**Factor Loadings**

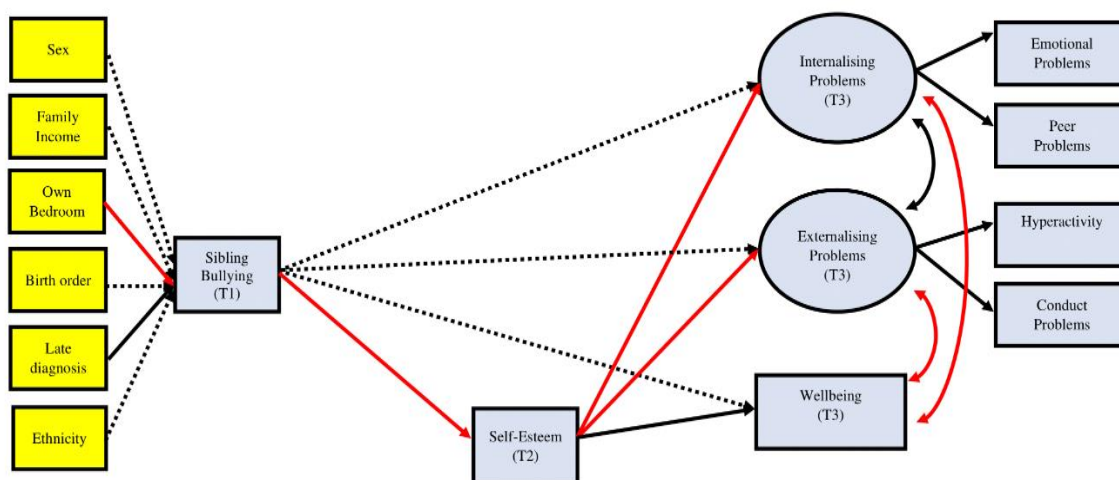
Internalising Problems (T3) → Emotional Problems (T3)	<b>.67</b>	.07	9.58	<b>&lt;.001</b>	.53, .80
Internalising Problems (T3) → Peer Problems (T3)	<b>.43</b>	.06	6.74	<b>&lt;.001</b>	.31, .56
Externalising Problems (T3) → Conduct Problems (T3)	<b>.64</b>	.05	11.97	<b>&lt;.001</b>	.53, .74
Externalising Problems (T3) → Hyperactivity (T3)	<b>.75</b>	.05	14.25	<b>&lt;.001</b>	.64, .85

**Table 4 (6.4)***Mediation Results (n=415)*

Mediation Pathways	Standardised Coefficients			Sobel Test				
	X → M $\beta$ (p)	M → Y $\beta$ (p)	X → Y $\beta$ (p)	Ind. eff.	Std. err.	z	p	95% CI
Sibling Bullying (T1) → Self-Esteem (T2) → Internalising Problems (T3)	-.158 <b>(.004)</b>	-.301 <b>(.002)</b>	-.196* <b>(.041)</b>	<b>.048</b>	.023	2.11	<b>.035</b>	.01, .09
Sibling Bullying (T1) → Self-Esteem (T2) → Externalising Problems (T3)	-.158 <b>(.004)</b>	-.272 <b>(&lt;.001)</b>	.023 (.787)	<b>.043</b>	.020	2.18	<b>.029</b>	.01, .09
Sibling Bullying (T1) → Self-Esteem (T2) → Wellbeing (T3)	-.158 <b>(.004)</b>	.306 <b>(&lt;.001)</b>	.068 (.365)	<b>-.048</b>	.020	-2.45	<b>.014</b>	-.09, -.01

*Note.* \*Results that are different from the hypothesised mediation model.

**Figure 1 (6.1)***The Hypothesised Model Mediation Results*



*Note.* The solid black arrows represent significant positive interactions, the solid red arrows represent significant negative interactions, and the dotted arrows represent non-significant paths. The model controls for self-esteem (T1), however, it is not illustrated in the graph for clarity purposes. Additionally, paths between demographic covariates and interest variables (i.e., self-esteem, internalising and externalising problems, and wellbeing) are not shown for clarity purposes. However, their path coefficients are outlined in Table 3. Blue Highlighted: Main interest variables. Yellow highlighted: Control (covariate) variables. Ethnicity: 0=Non-White, 1=White; Sex: 0=Female, 1=Male; Late Diagnosis: 0=No, 1=Yes; Birth Order: 0= First-born, 1= Second-or later-born; Own Bedroom: 0= No, 1= Yes; Family Income: 0= Above Average OECD, 1= Below Average OECD. Positive values indicate higher rates of sibling bullying, increased internalising and externalising problems, and better self-esteem and wellbeing.

### 6.3.4 Covariates (Mediation)

The mediation model also controlled for potential covariates. For this, potential demographic correlates of sibling bullying (i.e., ethnicity, sex, birth order, number of siblings, own bedroom, and family income) were tested as risk factors in the proposed model, regardless of whether they showed a significant bivariate correlation with sibling bullying in PBIS matrix (Table 1). Additional paths were added between demographic variables and other model variables (i.e., self-esteem, internalising and externalising problems, and wellbeing) where significant correlations were found in PBIS matrix (see Table 1). The path analysis showed that being diagnosed late with autism was the only significant covariate of sibling bullying in early adolescence when tested with all other demographic variables. That is, ethnicity, sex, birth order, number of siblings, having own bedroom, and family income were not significant correlates of sibling bullying in early adolescence. Additionally, despite their bivariate correlations, being White, late diagnosed, and living in a low-income household were no longer significant correlates of externalising problems in late adolescence upon testing with other model variables. Similarly, being late-diagnosed with autism was no



longer a direct correlate of wellbeing in late adolescence upon tested in the mediation model, though low family income was still a significant correlate of poorer wellbeing in late adolescence. Finally, no changes were observed in the significant correlates of internalising problems between the PBIS matrix (Table 1) and SEM paths (Table 3). That is, females and those who lived in low-income households showed higher internalising problems than males and those living in high-income households.

### **6.3.5 Sensitivity Findings**

Two separate SEMs were fitted for sensitivity purposes to replicate the findings of the hypothesised mediation model by replacing sibling bullying in early adolescence (predictor) with victimisation and perpetration. Both sensitivity models provided good model fits: Sensitivity SEM-1= Model Fit=  $\chi^2(35) = 39.28$ ,  $\chi^2(p) = .284$ , RMSEA = 0.017, CFI = 0.99, TLI = 0.98, CD = 0.61; Sensitivity SEM-2=  $\chi^2(35) = 38.09$ ,  $\chi^2(p) = .330$ , RMSEA = 0.01, CFI = 0.99, TLI = 0.98, CD = 0.63. Sensitivity analysis path coefficients can be seen in Tables S5 and S6 (Supplementary materials).

The sensitivity findings were almost identical to the original mediation findings. In summary, sensitivity models suggested that, regardless of the sibling bullying role (i.e., being a victim or perpetrator), being involved in sibling bullying in early adolescence reduced self-esteem in mid-adolescence and, in turn, reduced self-esteem, increased internalising and externalising problems, and reduced wellbeing in late adolescence. Similar to the original model, there were no direct correlations between the predictor (i.e., sibling bullying victimisation or sibling bullying perpetration in early adolescence) and outcome variables (i.e., internalising and externalising problems and wellbeing in late adolescence). This indicates that self-esteem in mid-adolescence fully mediated the longitudinal associations between sibling bullying victimisation or perpetration in early adolescence and mental health

and wellbeing in late adolescence in autistic adolescents. Detailed information regarding sensitivity mediation findings can be seen in Table S7 (Supplementary materials).

Although there were no differences in path analysis between the sensitivity and original models, some differences were observed in the demographic correlates of sibling bullying. For example, the original model indicated that being late diagnosed with autism was the only significant correlate of sibling bullying in early adolescence. Sensitivity findings indicated that autistic adolescents who were late-diagnosed with autism were more likely to bully their siblings, but were not more prone to be victimised by their siblings. Additionally, although the original model suggested no other covariates of sibling bullying in early adolescence, the sensitivity models showed that autistic adolescents who were White and had a shared bedroom were more likely to be victimised by their siblings than those who were non-White or had their own bedroom. That is, regardless of sibling bullying role – victimisation or perpetration— individuals who were involved in any type of sibling bullying in early adolescence, victimisation or perpetration, showed similar trajectories of self-esteem and mental health and wellbeing in middle and late adolescence. Despite this, the precursors of sibling bullying seemed to vary depending on the bullying role.

#### **6.4 Discussion**

This study has been the first to examine the longitudinal associations between sibling bullying, self-esteem, mental health, and wellbeing from early to late adolescence in autistic adolescents. Consistent with past reports, from the general and autistic populations, the current study found that sibling bullying was highly prevalent in the lives of autistic adolescents as about 40% reported bullying a sibling and 58% reported being victimised by a sibling at least *about once a week* (Deniz et al., 2022; Duncan, 1999; Menesini et al., 2010; Toseeb et al., 2018, 2020a; Wolke & Samara, 2004; Wolke & Skew, 2012). This finding also supports an earlier argument suggesting that sibling bullying may be the most prevalent form

of violence in adolescents' lives (Hoetger et al., 2015; Krienert & Walsh, 2011; Wolke & Skew, 2012). Additionally, for the first time, the current findings indicated that self-esteem in mid-adolescence is a significant mediator between sibling bullying in early adolescence and mental health and wellbeing in late adolescence in autistic adolescents.

#### ***6.4.1 Demographic Correlates***

Many researchers have suggested that having a male sibling is a risk factor for sibling bullying (Bowes, 2014; Dantchev et al., 2018; Tippett & Wolke, 2015; Toseeb et al., 2018, 2020a, 2020b; Tucker et al., 2013, 2014). However, no significant correlations were found between sibling bullying and sex in the present study. Although the current findings contradict some previous reports, there is also inconsistency in the existing literature in terms of the relationship between sex and sibling bullying. For instance, while some researchers suggested that males are more likely to be perpetrators of sibling bullying (Menesini et al., 2010) others disagreed suggesting that females are either equally or more likely to be perpetrators of sibling bullying than males (Duncan, 1999). Additionally, Tippett and Wolke (2015) suggested that males are more likely to be victims as well as perpetrators of bullying compared to females. Moreover, while Tucker et al. (2013) found higher rates of sibling bullying between male-male sibling pairs than otherwise formed sibling pairs such as male-female, Wolke and Skew (2011) found higher rates of bully-victims in families formed with mixed siblings (males-females) than otherwise formed families (i.e., brothers-only or sisters-only). That is, although previous studies draw an association between sex and sibling bullying, the existing evidence, including the current study findings, is inconsistent regarding the role of sex in sibling bullying. Hence, more research is needed to clarify the relations between siblings' sex composition and sibling bullying.

Less controversial, but still inconsistent, most of the existing evidence suggests that being the first-born and having two or more siblings increase the likelihood of being involved

in sibling bullying (Bowes et al., 2014; Dantchev et al., 2018; Toseeb et al., 2018, 2020a, 2020b; Tucker et al., 2013, 2014). However, there are also opposing arguments in the literature. For instance, some researchers have found that first-born children are more likely to be both victims and bullies of sibling bullying than second or laterborns (Tippett & Wolke, 2015). Additionally, a recent report has shown that adolescents with one-only sibling had higher rates of sibling bullying than those with two or three or more siblings (Deniz et al., 2023). Adding to this inconsistency in the literature, no correlations were found between sibling bullying, victimisation and perpetration, and birth order or number of siblings. Hence, given that most of the existing evidence comes from the general population, more studies are needed to shed light on the role of birth order and the number of siblings in families of autistic adolescents.

Previous research has reported that coming from a White ethnic background is a risk factor for increased sibling bullying (Dantchev et al., 2018; Tippett & Wolke, 2015; Toseeb et al., 2018, 2020a; Tucker et al., 2013, 2014). The present study found no correlations between ethnicity, number of siblings, birth order and sibling bullying in autistic adolescents. However, White autistic adolescents were more likely to be victimised by their siblings, but not to bully their siblings, than non-Whites. That is, autistic children who live in families from White ethnic backgrounds may be at increased risk for being bullied by their siblings, but may not be more likely to be perpetrators of bullying. This well aligns with a recent report, as Toseeb et al. (2020b) have also found that White adolescents are at increased risk of being a victim (i.e., victim-only) but not a perpetrator (i.e., bully-only) of sibling bullying. Perhaps, this may be because non-White families are more inclined to protect their autistic child during sibling conflict and bullying situations than White families (Deniz et al., 2023).

For the first time, the current study found that autistic adolescents who were late-diagnosed with autism were at an increased risk for being involved in sibling bullying

compared to those with an early autism diagnosis. The sensitivity models showed that this correlation was related to bullying a sibling but not being victimised by a sibling. That is, autistic adolescents who were late diagnosed with autism were more likely to bully their siblings than those who were early diagnosed. Given that females are more likely to be late-diagnosed with autism than males (Milner et al., 2023) this may potentially place autistic females at a relatively higher risk of involvement in sibling bullying than autistic males.

Similarly, for the first time, the current study explored that autistic adolescents who shared a bedroom with their siblings were more likely to be involved in sibling bullying than those who had their own bedrooms. Again, the sensitivity models showed that this was linked to bullying a sibling but not being victimised by a sibling. That is, autistic adolescents who shared a bedroom with their siblings were more likely to bully their siblings than those who had their own bedrooms. They were not, however, more likely to be victimised by their siblings than those who had their own bedrooms. One could argue that sharing a bedroom potentially prepares the best possible ground for sibling bullying as it increases the time spent together with no or low parental supervision, which increases the risk for sibling conflict and bullying (Monks et al., 2009; Wolke et al., 2015; Toseeb, 2022). It could also be argued that sharing a bedroom may potentially increase the risk of being involved in sibling bullying due to a lack of personal space and privacy (Stadheim et al., 2022). Given that sharing a bedroom increased the risk of bullying a sibling, but not being victimised by a sibling, one might argue that autistic adolescents may tolerate their siblings less than being tolerated by their siblings. Future researchers would benefit from replicating the current literature-leading findings suggesting that sharing a bedroom may be a risk factor for sibling bullying perpetration in autistic adolescents. Researchers would also benefit from replicating the current findings in non-autistic populations.

The existing literature on the relationship between low family income and sibling bullying has largely remained inconsistent in the past years. While some researchers found no correlations between sibling bullying and low family income (Dirks et al., 2019; Toseeb et al., 2020b), one study reported negative correlations (Toseeb et al., 2018). The present study, however, found significant correlations between sibling bullying and low family income which is consistent with previous reports (Eriksen & Jensen, 2009; Liu et al., 2021; Tippett & Wolke, 2015). This finding is also backed up by the resource control theory which suggests that coercive behaviour, in this context of bullying, takes place to gain or maintain control over limited resources (Salmon & Hehman, 2014). However, upon controlling for all other individual risk factors, family income was no longer correlated with increased sibling bullying. The current sensitivity findings also showed no significant correlations between subtypes of sibling bullying (victimisation and perpetration) and family income. This demonstrates that the inconsistency in the literature regarding the link between family income and sibling bullying may be due to the confounding effects of other risk factors. Thus, more research is needed to understand whether sibling bullying is more common in low-income families compared to high-income families upon controlling for other individual – and family–level risk factors.

In regard to the covariates of other interest variables, the current findings were somewhat congruent and somewhat inconsistent with the available literature. Consistent with the existing literature (Toseeb et al., 2018; Tucker et al., 2013), the current findings showed that autistic adolescents who were female and lived in low-income households had poorer mental health compared to males and those living in high-income households. They also indicated that autistic adolescents who lived in low-income households had poorer wellbeing compared to others, which also well aligns with a previous report (Toseeb & Asbury, 2022). Additionally, aligning with the previous reports, the current study found that female autistic

adolescents and those who had older siblings were at increased risk for lower self-esteem than those without any older siblings (Corden et al., 2021; Fukuya et al., 2021). Although there is some evidence that somewhat contradicts the current findings, as some researchers have found no correlations between sex and self-esteem (Adkins, 2003; Arwert & Sizoo, 2020; Cooper et al., 2021), this evidence primarily comes from either autistic adults or the general population, while little is known about the demographic correlates of self-esteem in autistic adolescents. Thus, more research is needed to support or disprove the current findings, as the existing literature on which to base the current findings is weak.

#### ***6.4.2 Sibling Bullying and Mental Health and Wellbeing***

The current findings rejected H<sub>1</sub> suggesting that sibling bullying involvement in early adolescence does not directly predict increased internalising and externalising problems and poorer wellbeing in late adolescence in autistic adolescents. The current findings do not align with an abundance of previous reports which indicated significant direct associations between sibling bullying and mental health and wellbeing (Bowes et al., 2014; Buist & Vermande, 2014; Coyle et al., 2017; Duncan, 1999; Liu et al., 2020; Mathis & Mueller, 2015; Plamondon et al., 2021; Tucker et al., 2013; Toseeb et al., 2018, 2020a; Toseeb & Wolke, 2021; Wolke et al., 2015). Perhaps one of the main reasons for this inconsistency may be that the current study findings indicated causal associations (i.e., mediation model), whereas the contradicting previous evidence indicated correlations between sibling bullying and mental health and wellbeing without any causal inferences. Additionally, the current findings are based on the long-term longitudinal associations between sibling bullying and mental health, while some previous reports only focused on concurrent or proximal associations between sibling bullying and mental health and wellbeing. Supporting this argument, a recent report which tested the causal links (i.e., mediation) also found no direct links between sibling victimisation and internalising problems in adolescents (Fite et al., 2022). That is, although

most of the evidence in the literature indicates that sibling bullying is correlated with poorer mental health and wellbeing, the nature of this association may be indirect.

#### ***6.4.3 Sibling Bullying and Self-Esteem***

In favour of H<sub>2</sub>, aligning with the existing literature, the current findings suggested that autistic adolescents who had higher sibling bullying rates in early adolescence had lower levels of self-esteem in mid-adolescence (Plamondon et al., 2021; Sapouna & Wolke, 2013; Sharpe et al., 2021; Sherman et al., 2006; Skinner & Kowalski, 2013; Toseeb & Wolke, 2021), compared to those with lower rates of sibling bullying in early adolescence. Again, aligning with previous findings (Dantchev & Wolke, 2019b) based on zero-order correlations, i.e., not causal, high levels of self-esteem in early adolescence may serve as protective factors against subsequent sibling bullying involvement in mid-adolescence in autistic adolescents. Hence, it could be argued that increased rates of sibling bullying appear to be direct risk factors for reduced levels of self-esteem later in life and high levels of self-esteem seem to prevent experiencing sibling bullying later in life in autistic adolescents. Hence, promoting the self-esteem of autistic adolescents may reduce the risk of sibling bullying involvement for such individuals.

#### ***6.4.4 Self-Esteem, Mental Health, and Wellbeing***

Backing H<sub>3</sub>, autistic adolescents who had lower self-esteem in mid-adolescence showed higher internalising and externalising problems and poorer wellbeing in late adolescence compared to those with higher levels of self-esteem. The former finding well aligns with the previous reports, from the general population, as self-esteem has often been found as a negative correlate of internalising and externalising problems (Boyes et al., 2020; Cooper et al., 2017; Fernandes et al., 2021), and a positive correlate of wellbeing (Cooper et al., 2017; Corden et al., 2021; Padhy et al., 2011; Poudel et al., 2020). Although not hypothesised, there were no direct prolonged effects of self-esteem in early adolescence on



internalising and externalising problems in late adolescence in autistic adolescents. This, perhaps, could be related to the development course of self-esteem as researchers have reported that self-esteem drops significantly when transitioning from childhood to adolescence (Harter, 2015). That is, high levels of self-esteem in middle adolescence, but not in early adolescence, may protect the mental health and wellbeing of autistic adolescents in late adolescence.

Confirming H<sub>4</sub>, higher rates of sibling bullying in early adolescence predicted reduced self-esteem in mid-adolescence. In turn, reduced self-esteem in mid-adolescence predicted poorer mental health wellbeing in autistic adolescents in late adolescence. The current findings extended the previous knowledge beyond past studies (Sharpe et al., 2021; Toseeb & Wolke, 2021) and, for the first time in the literature, suggested that self-esteem significantly mediates the associations between early sibling bullying involvement and later mental health difficulties and poorer wellbeing in autistic adolescents. The current findings also suggest that both being victimised by a sibling and bullying a sibling have similar deteriorating impacts on the mental health and wellbeing of autistic adolescents.

#### ***6.4.5 Strengths and Limitations***

A major strength of this study is the use of a sample of autistic adolescents that is drawn from a UK-based representative cohort study. The longitudinal and representative nature of the data increased the chance of generalisability of the results to western populations. Furthermore, the use of the well-known and widely used psychometric scales increased the validity and reliability of the reported results. Moreover, the use of advanced statistical techniques to handle missing data further minimised the bias estimates of the parameters and increased the sample power.

There were also limitations. For instance, although the current study used a nationally representative sample of adolescents in the UK, the sample consisted of predominantly male

participants (78%). Although recent figures still show that males are three to four times more likely to be diagnosed with autism, the ongoing debates indicate that females may be under-represented in both autism research and diagnosis. Future researchers would benefit from a better representation of females. Moreover, the low power in the female sample further prevented us from conducting a multi-group SEM to test the potential effects of sex~late autism diagnosis (i.e., late diagnosed females) interaction in the associations between sibling bullying, self-esteem, and internalising problems. Furthermore, whilst the use of well-validated psychometric scales is the one strengths of the study, the measure of sibling bullying is based on single-item victimisation and perpetration questions. Future researchers should make use of multi-item sibling bullying scales to increase the sensitivity of the measure. Another limitation of the study is the type of self-report scales that were used to report sibling bullying, mental health, and wellbeing of the autistic participants. Since the sample was drawn from a nationally representative cohort study, none of the scales that were used was specifically developed for autistic individuals which raises concerns over the sensitivity of the findings. Additionally, the lack of information regarding siblings' age, gender, and autistic characteristics, which could serve as potential covariates, was another limitation. Finally, it is important to note that the current models did not control for other types of bullying and victimisation, especially peer bullying, which hold the potential to confound the associations reported in this study.

#### ***6.4.6 Conclusions and Implications***

In conclusion, the current findings show that sibling bullying is highly prevalent in the lives of autistic adolescents as nearly one in two autistic adolescents experience sibling bullying about once a week. Additionally, instead of a direct link, sibling bullying involvement in early adolescence is indirectly correlated with poor mental health and

wellbeing in late adolescence through a reduction in self-esteem in a mid-time-point (i.e., mid-adolescence) in autistic adolescents.

Regarding implications, the current findings suggest that sibling bullying is not a routine, part of daily sibling interaction and hence it should be considered a serious form of violence that deteriorates the mental health and wellbeing of autistic adolescents. Hence, there is an immediate need for sibling bullying prevention programmes in families of autistic adolescents as early prevention of sibling bullying is likely to protect the self-esteem, and therefore, the mental health and wellbeing of autistic adolescents. Finally, where delivering sibling bullying interventions is not feasible, due to them taking place behind closed doors and most children not disclosing such experiences to their parents or others, interventions targeting the self-esteem of such individuals are likely to further protect their subsequent mental health and wellbeing from the detrimental effects of sibling bullying.

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# **Chapter 7: Study IV: Sibling Relationships and Parental Interventions to Sibling Bullying During Covid-19: A Qualitative Comparison of British and Turkish Families of Autistic Adolescents**

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## Abstract

**Background and aims:** Despite its high potential for affecting sibling relationships, few studies have explored the impact of the Covid-19 pandemic on this important family dynamic. Of these, the reported evidence has been inconsistent across cultures and lacks cross-cultural comparability. For the first time, the current study investigated cross-cultural variability in the impact of Covid-19, and the restrictions associated with it, on sibling relationships of autistic adolescents from a Western (United Kingdom) and non-Western (Turkey) country. The current study also explored how British and Turkish parents intervene in negative sibling interactions – i.e., sibling bullying –when witnessed.

**Methods:** Parents of 164 British and 96 Turkish autistic adolescents, aged 9-20 years, were asked how they perceived the effects of Covid-19 on their children's sibling relationships, and how they were most likely to react to instances of sibling bullying. Free response data from parents were analysed using qualitative content analysis.

**Results:** The current findings indicated more cross-cultural similarities than differences between British and Turkish families. The majority of both British and Turkish parents indicated that Covid-19 worsened sibling relationships between their autistic and non-autistic children. An overwhelming majority of British and Turkish parents also said that they would step in directly when witnessing sibling bullying. Despite the high volume of cross-cultural similarities generally, some cross-cultural differences were also found, for instance in relation to the most common negative impact of Covid-19 on sibling relationships and the most preferred parental responses to sibling bullying.

**Conclusions and implication:** Implications and suggestions are discussed in more detail, drawing on the Etic approach to cross-cultural psychology.

## 7.1 Introduction

Nearly all families around the globe had to abide by nationwide lockdowns, stay-at-home orders, school closures, and social distancing rules during the Covid-19 pandemic. This social disruption, without proper support in place, brought profound challenges for intra-family relationships such as increased parental stress and burnout, marital conflict, and parent-child conflict (Asbury et al., 2021; Horton et al., 2022; Russell et al., 2020). Such deteriorations in intra-family relationships were projected to have a spillover impact on sibling relationships (Prime et al., 2020). Similarly, some researchers predicted that the increased proximity of siblings during the pandemic (Perkins et al., 2021) and reduced parental supervision (Fontanesi et al., 2020) would increase negative sibling interactions such as sibling violence. Confirming what Prime et al. (2020) projected, researchers have indeed found deteriorated sibling relationships with strong links to negative intra-family relationships during the pandemic (Horton et al., 2022). Additionally, aligning with Perkins et al.'s (2021) predictions, researchers have found that the pandemic increased daily sibling conflict and sibling violence among children and youth due to increased proximity, i.e., increased time together, of siblings (Salmon et al., 2022; Stadheim et al., 2022; Toseeb, 2022). That is, Covid-19-related social disruptions and their immediate consequences for intra-family relationships have had profound impacts on sibling relationships.

### *7.1.1 Impact of Covid-19 on Sibling Relationships in Families with an autistic child*

The deteriorating impact of the pandemic on sibling relationships may have been particularly prominent in some families where additional challenges were in place, for example, families with one or more autistic children. Families with autistic children appear to have been disproportionately affected by the pandemic for reasons including autistic children's resistance to changes in routines, urgent needs for education and therapies, and intense child-care responsibilities for parents (Asbury & Toseeb, 2023; Bellomo et al., 2020).

Such a disproportionate impact on the lives of autistic children and their families meant there were likely to be heightened risks for experiencing negative intra-family relationships (Degli Espinosa et al., 2020) which could then lead to negative sibling relationships (Prime et al., 2020). Confirming this, researchers have reported increased sibling fights, rivalry, and jealousy since the onset of the pandemic in families with autistic children (Stadheim et al., 2022; Tokatly Latzer et al., 2021; Toseeb, 2022<sup>1</sup>). Those researchers have argued that changes in routines, challenges in remote education and therapy, increased parental stress, and increased time spent together at home heightened the risk of deteriorating impacts of the pandemic in such families.

Furthermore, given autistic individuals' emerging social interests during the transition from childhood to adolescence, pandemic-related social disruption may have been a particular challenge for families of autistic adolescents. It is suggested that the improvement in social communication skills from childhood to adolescence may trigger social interest and desires for peer interaction in autistic adolescents (Fecteau et al., 2003; McGovern & Sigman, 2005; Seltzer et al., 2003). Despite their increased peer interest during adolescence, autistic adolescents are less likely to see friends, get called by friends, and be invited to social activities with friends out of school compared to their non-autistic peers (Shattuck et al., 2011). That said, school is the primary source for autistic adolescents to socialise and interact with their peers. This means that school closures and confinement to the house during the pandemic potentially meant a sudden loss of full-scale peer interaction for autistic adolescents. Such social isolation felt to this extent may have triggered mental health problems in autistic adolescents such as anxiety, depression, and stress (Cage & McManemy, 2022), which have previously been reported as being associated with negative sibling interactions (Toseeb et al., 2018, 2020a). Thus, unmet social needs due to unprecedented

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<sup>1</sup> This study had a sample of children and youth with special educational needs, mostly autistic (75%).

social isolation in families of autistic adolescents have made them more susceptible to the negative effects of the pandemic than other young people.

Also, families consisting of autistic and non-autistic siblings may have been more prone to the negative impact of the pandemic than those with autistic-only siblings. This argument is based on the homophily-effect theory which suggests that individuals prefer forming friendships and social relationships with people similar to themselves (Lazarsfeld & Merton, 1954). In support of this, researchers have reported that autistic individuals show a tendency in forming friendships based on propinquity (i.e., proximity) and homophily meaning that they prefer to be friends with autistic peers more than non-autistic peers (Black et al., 2022; Chen et al., 2021). The reverse argument is also true; neurotypical<sup>2</sup> individuals may prefer forming friendships with neurotypical peers (Hoffmann et al., 2021). Perhaps the double-empathy problem<sup>3</sup> (Milton, 2012) may be the leading cause of homophily-oriented friendships in these groups. Strengthening these arguments, the likelihood of experiencing negative peer interactions, such as bullying, is higher between autistic and non-autistic peers compared to autistic-autistic or autistic-SEN peers (Humphrey & Hebron, 2015; Maiano et al., 2016). Taken from here, families formed by autistic-non-autistic sibling pairs may have been at greater risk for experiencing negative sibling interactions during the pandemic than families of autistic-autistic sibling pairs.

Increased sibling conflict in autistic families during the pandemic (Stadheim et al., 2022; Tokatly Latzer et al., 2021; Toseeb, 2022) could evolve into a more harmful form of negative sibling interaction such as bullying (Hoetger et al., 2015; Wolke et al., 2015).

Sibling bullying is defined as repeated aggressive behaviours that intend to harm the other sibling directly (i.e., physical bullying) or indirectly (i.e., social, relational, or psychological

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<sup>2</sup> Individuals with typical neurological functioning.

<sup>3</sup> The double empathy problem suggests a mutual failure between autistic and non-autistic individuals to take the perspective of the other.

bullying) (Wolke et al., 2015). It is potentially the most common form of violence in autistic adolescents' lives because it has been found that as many as one in two experience sibling bullying every week (Deniz & Toseeb, 2022; Toseeb et al., 2018). Hence, given that autistic adolescents already had high rates of sibling bullying prior to the onset of the pandemic, increased time together at home with limited space has potentially created fertile ground for daily sibling conflict and perhaps increased sibling bullying (Toseeb, 2022).

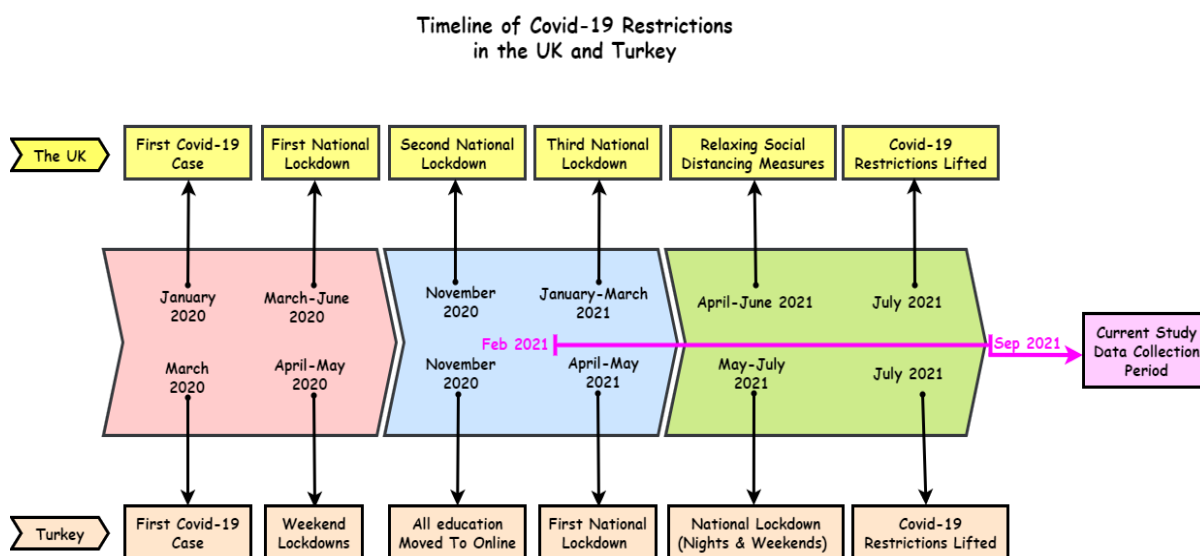
### ***7.1.2 Sibling Relationships in Cross-Cultural Context During Covid-19***

Covid-19 may have worsened sibling relations, and this effect could have varied across cultures due to differences in the strictness of governmental measures and culture-specific protective mechanisms. Supporting this, Foley et al (2021) have found a positive link between the stringency of Covid-19 measures and intra-family difficulties such as parent-child conflict. This multi-national study reported that families from the United States experienced greater social disruption than those from China. Based on the previously made argument, (Prime et al., 2020), American children may be expected to deteriorate more in sibling relations than Chinese ones. However, researchers have found no significant changes in sibling relationships in American families during the pandemic (Cassinat et al., 2021; Sun et al., 2021), while both improving and worsening impacts have been reported from Chinese families (Jiang et al., 2023; Tang et al., 2022; Zhang et al., 2022). This indicates that there may be culture-level protective mechanisms that mitigated the negative impact of the pandemic on intra-family relationships. In this specific case, Foley et al. (2021) have argued that this was potentially due to the protective impact of the American families' unique daily family routines such as having family meals, doing family leisure activities, and following bedtime routines. That is, although the differences in the stringency of the pandemic measures are likely to lead to differing impacts of the pandemic on sibling relationships, culture-specific protective mechanisms might mitigate this impact.

The United Kingdom (UK) and Turkey, two culturally distanced countries (Hofstede Insights, 2023), differed in the severity and duration of the pandemic measures implemented. This means that families from the two cultures faced unequal levels of social disruption. As can be seen in Figure 1, the UK government imposed stricter and longer-term Covid-19 restrictions than the Turkish government; families in the UK entered their third nationwide lockdown while Turkish families were yet to enter their first nationwide lockdown. Given the greater social disruption faced by British families, British siblings may be expected to be more susceptible to the pandemic than Turkish siblings. The literature is extremely limited in this regard. However, evidence from both cultures suggests increased levels of negative sibling interactions during the pandemic (Sancili & Tugluk, 2021; Toseeb, 2022). More specifically, a recent cross-cultural comparison between British and Turkish families of autistic adolescents showed higher rates of sibling bullying in British families than in Turkish ones during the pandemic (Deniz & Toseeb, 2023). That is, families of autistic adolescents facing greater social disruptions have been more prone to the impact of the pandemic than others.

**Figure 1 (7.1)**

*The Covid-19 Pandemic Timeline in The UK and Turkey*



British and Turkish families show distinct family characteristics some of which could have influenced the way Covid-19, and restrictions associated with it, impacted sibling relationships. For instance, British mothers of autistic adolescents have, on average, higher educational attainment, are more likely to be in paid employment, and spend less time with their children than Turkish mothers which points towards potentially lower parental supervision in British families than in Turkish ones (Deniz & Toseeb, 2023). Additionally, a greater proportion of mothers in employment means higher rates of parentification – caregiving responsibilities of siblings – for British siblings compared to Turkish ones (Kosonen, 1996; Updegraff et al., 2011). Conversely, Turkish families are larger, have more children, and show higher rates of poverty than British families (OECD, 2023a, 2023b) which indicates lower familial resources and higher overcrowding rates in Turkish families than in British ones. Such family characteristics, in both cultures, are likely to serve, to some extent, as risk factors for negative sibling interactions (Bowes et al., 2014; Deniz & Toseeb, 2023; Dirks et al., 2019; Tippett & Wolke, 2015; Toseeb et al., 2020b; Tucker et al., 2014; Wolke et al., 2015). That said, family characteristics of British and Turkish parents are likely to mitigate, i.e., strengthen or weaken, the impact of the pandemic on sibling relationships.

British and Turkish families differ in parenting styles, which could have potentially impacted the way Covid-19 measures affected sibling relationships. For instance, in child disciplining, British parents prefer verbal communication and negotiations while Turkish parents tend to use physical punishment (Aytac et al., 2019). This could lead to differing parental responses to negative sibling interactions, such as conflict and bullying, which holds the potential to increase or decrease the likelihood of such actions being repeated. For instance, siblings in families where parents use punitive disciplinary techniques exhibit increasingly aggressive and hostile behaviours towards each other (Cicirelli, 2013). Given that Turkish parents show more negativity and apply disciplinary measures (e.g., punishment,



verbal criticism) more often than British parents (Aytac et al., 2019; Gürmen & Kılıç, 2022), Turkish siblings might have been at a heightened risk for repeated sibling conflict, and bullying too, during the pandemic than British siblings.

### ***7.1.3 The current study***

The evidence suggests that Covid-19 has worsened sibling relations. There are growing concerns about the impact of Covid-19 on sibling relationships in families of autistic adolescents with autistic-non-autistic sibling pairs. Within this particular group, sibling relationships in families living in countries with high levels of COVID-19-related restrictions may have been worsened above and beyond the deterioration felt in other cultures where milder restrictions were in place. However, this is not clear cut as the existence of culture-specific protective mechanisms might have mitigated the negative impact of Covid-19 on sibling relationships in those cultures. Similarly, differing parental intervention styles to negative sibling interactions, such as bullying, could have influenced, i.e., strengthened or weakened, the impact of Covid-19 on sibling relationships. Such lack of clarity makes it particularly important to investigate the impact of the Covid-19 pandemic on sibling relationships and parents' intervention styles when faced with sibling bullying in families of autistic adolescents from two culturally distanced countries where Covid-19 measures were in place at different stringency. To bridge this knowledge gap, this study, for the first time, proposes a cross-cultural comparison of families of autistic adolescents from two distant cultures (the UK and Turkey) where Covid-19 measures were in place at different scales.

The current study had two aims. First, to investigate how British and Turkish parents perceived the impact of the Covid-19 pandemic on the relationships between their autistic and non-autistic children. Based on previous research (Stadheim et al., 2022; Tokatly Latzer et al., 2021; Toseeb, 2022), the current study expected to find worsened sibling relationships in both British and Turkish families during the pandemic. Given the differences in the

stringency of Covid-19 measures in both countries, more deteriorated sibling relationships were expected in British families compared to Turkish ones. Finally, it was predicted that both British and Turkish parents would report indices of sibling bullying during the pandemic (*e.g., constant physical harm, picking on each other*). However, it was also expected that parents may not explicitly mention such instances as bullying due to most parents not perceiving such negative sibling interactions as bullying (Caffaro, 2013; Rypi, 2023; Skinner & Kowalski, 2013). Second, based on expectations towards the occurrence of sibling bullying indices during the pandemic, the current study aimed to investigate how British and Turkish parents intervene in sibling bullying when witnessed. According to a previous report (Aytac et al., 2019), the expectation was that Turkish parents would take more disciplinary measures than British parents when intervening in sibling bullying.

In performing the cross-cultural comparison, a commonly used cross-cultural psychological approach was adopted, *i.e., Etic*, which focuses on the presence or absence of between-culture variations on a psychological phenomenon (Kagitcibasi & Berry, 1989). That said, investigating potential causes of cross-cultural differences between the two cultures, *i.e. the Emic approach*, was not within the scope of the present study unless it was directly observed in the data. For example, in case Turkish parents are found to take disciplinary actions more often than British parents, as hypothesised, the reason why Turkish parents are more likely to take disciplinary actions than British parents will stay out of the scope of the study unless explicitly mentioned by parents. Therefore, following the Etic approach, the current study sought to answer two research questions: (1) Do British and Turkish families of autistic adolescents differ in terms of parents' perceptions of the impact of Covid-19 on their children's sibling relationships? and (2) Do British and Turkish families of autistic adolescents differ regarding parental intervention styles to sibling bullying?

## 7.2 Methods

### 7.2.1 Ethical Approval

Ethical approval for this study was granted by the Department of Education Ethics Committee, University of York (Ref: FC20/2). Research permission was also sought from Turkey Ministry of National Education (Ref: b34d-55f1-3d4e-9ee4-6c65) to recruit participants from Turkish schools. All participants provided informed consent.

### 7.2.2 Sampling

The present study is part of a larger-scale project in which convenience sampling was used to recruit parents of autistic adolescents from the UK and Turkey. To participate in the study, families were required to meet the following criteria: *a) having an autistic child, b) the autistic child is between nine and 20 years of age<sup>4</sup>, c) having a non-autistic child, and d) both autistic and non-autistic child had been living in the same house in the preceding six months*. To determine whether the families met the first inclusion criteria (a), parents were asked to answer the following questions: “*Have any of your children been diagnosed with autism, Asperger’s syndrome or autistic spectrum disorder?*” and “*What types of special education needs or disabilities does your child have?*”. Those who answered *yes* to the former question or *autism spectrum conditions* to the latter question met the inclusion criteria.

An online survey, containing multiple-choice questionnaires, was distributed to parents of autistic adolescents using Qualtrics (Qualtrics, 2022). In cases where parents had more than one autistic or non-autistic child, they were asked to choose two siblings closest in age when answering the survey. All data were collected between February and September 2021. Detailed information regarding the national Covid-19 measures of both countries, during the data collection period, can be seen in Figure 1.

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<sup>4</sup>This inclusion criterion was defined to recruit autistic adolescents. According to the World Health Organisation (2023), adolescence is the period of life between childhood and adulthood which covers ages 10 and 19. Since the current study was designed as a 1-year longitudinal study, the lower and upper age bounds were moved 1 year and set as 9 and 20 to maximise the sample power.

### 7.2.3 Participants

A total of 260 parents of autistic adolescents (British=164, Turkish=96) answered the open-ended questions, which constituted the sample for the present study. Sample characteristics are summarised below, and detailed information about siblings' demographics is shown in Table 1.

**Table 1 (7.1)**

#### *Demographic Characteristics of Siblings by Country*

	UK (n=164)		TR (n=87*)	
	Autistic	Non-autistic	Autistic	Non-autistic
Mean age (Years)	13.2	12.0	12.6	14.4
Boys n (%)	122 (74%)	76 (46%)	73 (84%)	45 (52%)
First-born n (%)	94 (57%)	47 (29%)	44 (51%)	31 (36%)
Full-biological siblings n (%)	145 (88%)		79 (91%)	
One only sibling n (%)	106 (65%)		60 (69%)	
Same-sex siblings n (%)	94 (57%)		51 (59%)	
Siblings mean time spent together (Pre-Covid) <sup>5</sup>	4.5h		6.6h	
Siblings mean time spent together (After-Covid) <sup>2</sup>	6.1h		7.4h	
Parent-child mean time spent together (Pre-Covid) <sup>6</sup>	5.8h		8.1h	
Parent-child mean time spent together (After-Covid) <sup>3</sup>	7.8h		9h	
Autistic Child School type-Mainstream n (%)	66 (40%)		40 (46%)	
Autistic Child School type-Special n (%)	82 (50%)		34 (39%)	
Autistic Child School type-Other n (%)	13 (8%)		12 (14%)	
Autistic Child School type-Not in education n (%)	3 (2%)		1 (1%)	
Full-time school attainment	114 (70%)	100 (61%)	57 (65%)	70 (80%)

*Note.* \* Of 96 Turkish parents, 9 participants did not report any demographic information.

<sup>5</sup> This represents time spent together between the autistic and non-autistic child

<sup>6</sup> This represents time spent together between the parent and both children

The characteristics of the British and Turkish families were broadly similar. For British families, the majority of respondents were mothers (87%), White (90%), married (78%), and living in England (96%). In terms of their children, the majority of autistic adolescents were boys (74%), and the non-autistic siblings were approximately equally boys (46%) and girls (54%). The mean ages of autistic and non-autistic siblings were 13.2 years and 12 years, respectively. For Turkish families, the majority of respondents were mothers (90%), Turkic ethnicity (86%), and married (80%). A large proportion of Turkish parents were living in Marmara - Greater Istanbul – province (40%). As with the British sample, the majority of Turkish autistic adolescents (84%) were boys, and their siblings were approximately equally boys (52%) and girls (48%). The mean ages of Turkish autistic adolescents and their non-autistic siblings were 12.6 years and 14.4 years, respectively. In both cultures, less than 2% were out of formal education (i.e., not attending school).

Concerning sample differences, mostly representing mothers, more British parents (57%) had a college or above degree compared to Turkish ones (22%). Additionally, there were more working mothers in the British sample (68%) compared to the Turkish sample (22%). Finally, Turkish parents were spending more daily time with their children than British parents, both pre-pandemic (British=5.8 hours; Turkish=8.1 hours) and during the pandemic (British=7.8 hours; Turkish=9 hours).

#### **7.2.4 Measures**

Parents were asked to report their own as well as their children's demographic information. Additionally, they were also asked to answer two open-ended questions in regard to the impacts of Covid-19 on children's sibling relationships, and how parents respond to sibling bullying among their children. All questions were asked in the participants' native language (English or Turkish). All questions were translated into Turkish by the first author, a bilingual speaker of both languages. Although the term *bullying* in English has a

literal translation in Turkish, *zorbalık*, to minimise the construct bias across two cultures, a broad definition for sibling bullying (see Q2) was provided using items from a well-constructed sibling bullying measure (Dantchev et al., 2019). Additionally, the existing literature indicates that parents tend to perceive sibling bullying incidents not as bullying due to the normalising discourse on the term sibling bullying and perhaps due to its very high prevalence (Wolke et al., 2015). Therefore, to be able to capture parents' responses and minimise attrition in this question, a semi-conditional sentence was used. That is, instead of asking parents their reaction to sibling bullying when witnessed, parents were asked how they react or would react when or *if they witness sibling bullying*.

**Q1:** "Please describe how the Covid-19 pandemic and school closures have been affecting the sibling relationships between your autistic child and their non-autistic sibling."

**Q2:** "Definition of sibling bullying: Sibling Bullying is when a sibling tries to upset the other one by saying nasty and hurtful things, or completely excluding [them] from their group of friends, hitting, kicking, pushing or shoving [them] around, telling lies or making up false rumours about [them]."

Please describe how you react or would react when or if you witness sibling bullying between your autistic child and their non-autistic sibling."

### ***7.2.5 Coding Frame and Analysis***

When conducting multi-site qualitative research, Miles and Huberman (1994) recommend using a detailed, systematic, and shared coding scheme as well as joint analysis of data across sites for consistency purposes. This has been successfully applied in previous multi-site research as well as in cross-cultural qualitative studies (Osborn, 2001; Webb et al., 2004). Additionally, it is suggested that cross-cultural research should be conducted by researchers who are familiar with the language and culture they are studying (Niblo &

Jackson, 2004). Thus, for consistency purposes, the entire coding and analysis procedures were carried out by the first author [ED], who is a bilingual speaker of Turkish and English and has lived in both cultural settings, using a single data-driven codebook. The second author [KA] assisted in the initial stages of the data coding process for the development of a codebook-based approach.

***Codebook Approach.*** In the present study, the codebook approach was followed to systematically code the multi-site and multi-language data (MacQueen et al., 1998). As the first step, prior to the development of the codebook, the first author [ED] deeply engaged with the data by reading the text repeatedly, highlighting potentially relevant segments, and taking notes (Forman & Damschroder, 2007). Second, upon sufficient engagement with the data, a hybrid coding scheme (a combination of inductive and deductive coding approaches) was developed. Third, the data was split into three parts for the application of the hybrid coding scheme: 1) Batch-I (10% of the data), 2) Batch-II (10% of the data), and 3) Batch-III (80% of the data). In the fourth step, Batch-I data were coded following a data-driven coding scheme (i.e., inductive coding) where codes were freely produced and a codebook, with codes, definitions of codes, and exemplar quotes, was drafted. The codebook was then reviewed and revised by the second author [KA]. In the fifth step, the first author used the agreed codebook to code Batch-II data (i.e., deductive coding). At this stage, new codes were allowed to be freely produced. The Batch-II data coding process was also reviewed and agreed upon by the second author. As the final step, the first author deductively coded the rest of the data – Batch-III – using the latest version of the agreed codebook.

***Qualitative Content Analysis.*** Following data coding, qualitative content analysis (QCA) was used to explore cross-cultural similarities and differences between families from the UK and Turkey. The QCA was chosen as the analytical method due to its advantages in analysing rich data that requires interpretation and in quantifying the qualitative findings in

multi-site comparisons such as cross-cultural comparisons (Bernard et al., 2016). It is described as a method for systematically analysing qualitative data to generate codes (manifests), group them under relevant subcategories, and combine those subcategories under higher-order latent meanings (categories) that may not be immediately obvious in texts (Schreier, 2012).

### **7.3 Results**

The current study, aimed to answer two research questions. First, this study focused on how British and Turkish parents perceived the impact of Covid-19 on their children's sibling relationships (RQ1). Negative impacts of the pandemic on sibling relationships were expected to be found in both cultures. Furthermore, the current study expected to find increased sibling conflict as well as indices of sibling bullying in both cultures. More specifically, higher instances of sibling conflict were expected to be found in British families than in Turkish families. Second, the current study also looked into how British and Turkish parents intervene in sibling bullying when witnessed (RQ2). For this, Turkish parents were expected to take disciplinary actions more often than British parents. The findings are presented in two sections with each section corresponding to the relevant research question.

#### ***7.3.1 The Impact of Covid-19 on Sibling Relationships***

To answer RQ1, three primary categories that correspond to the overall impact of Covid-19 on sibling relationships of autistic adolescents were identified: 1) *worsened*; 2) *improved*; and 3) *not affected*. As hypothesised, a negative impact of the pandemic on sibling relationships was found in both cultures, which was the most commonly reported impact of the pandemic (British=59%, Turkish=53%). Although not hypothesised, some parents, from both cultures, indicated a positive impact or no impact of the pandemic on sibling relations. Nearly a third of parents (British=33%; Turkish=31%) said that the pandemic had positive effects on sibling relationships. Finally, about one in five parents (British=18%,



Turkish=22%) indicated that Covid-19 did not affect the sibling relationships of autistic adolescents. In summary, the pandemic had three distinct impacts on the sibling relationships of autistic adolescents consistent across the two cultures. Despite the similar pattern found for the impact of the pandemic on sibling relationships in the two cultures, upon further investigation, additional cross-cultural differences were found in the way that Covid-19-related factors formed an overall negative or positive impact. Findings are discussed below, and detailed information is outlined in Table 2 and Figure 2.

**Table 2 (7.2)**

*Impacts of Covid-19 on Sibling Relationships: Codes, Subcategories, and Categories*

	British (N=145) Freq (%)	Turkish (N=91) Freq (%)		British	Turkish
<b>1. Worsened</b>	<b>84 (59%)</b>	<b>49 (54%)</b>	<i>Increased anger/temper</i>	3	5
<i>1.1. Cooped up</i>	13	13	<i>Increased resentment/frustration</i>	3	0
<i>Walled in</i>	0	13	<i>Increased stress</i>	4	1
<i>No alone time</i>	7	1	<i>Increased meltdowns</i>	5	0
<i>No space</i>	6	0	<i>Increased boredom</i>	0	5
<i>1.2. Struggled to get along</i>	37	20	<i>Withdrawn</i>	2	4
<i>Increased time together-Negative</i>	9	2	<b>2. Improved</b>	<b>48 (33%)</b>	<b>28 (31%)</b>
<i>Changes in routines-Negative</i>	1	4	<b>2.1. Improved mood</b>	6	0
<i>Increased tension</i>	5	2	<i>No outside triggers</i>	5	0
<i>Decreased patience</i>	10	3	<i>Less stressful</i>	3	0
<i>Strained relationships</i>	5	1	<b>2.2. Attached more</b>	32	15
<i>Increased aggression</i>	2	5	<i>Better relationships</i>	15	7
<i>Increased reliance or controlling</i>	8	2	<i>Brought them closer</i>	18	6
<i>1.3. Distanced</i>	18	17	<i>Cared more</i>	4	3
<i>Worse relationships</i>	9	16	<b>2.3. Increased positive interactions</b>	20	17
<i>Loss of sibling interest</i>	10	1	<i>Studied together</i>	4	1
<i>1.4. Increased sibling conflict</i>	53	11	<i>Chatted more</i>	4	1
<i>Argued more</i>	15	2	<i>Played more</i>	7	4

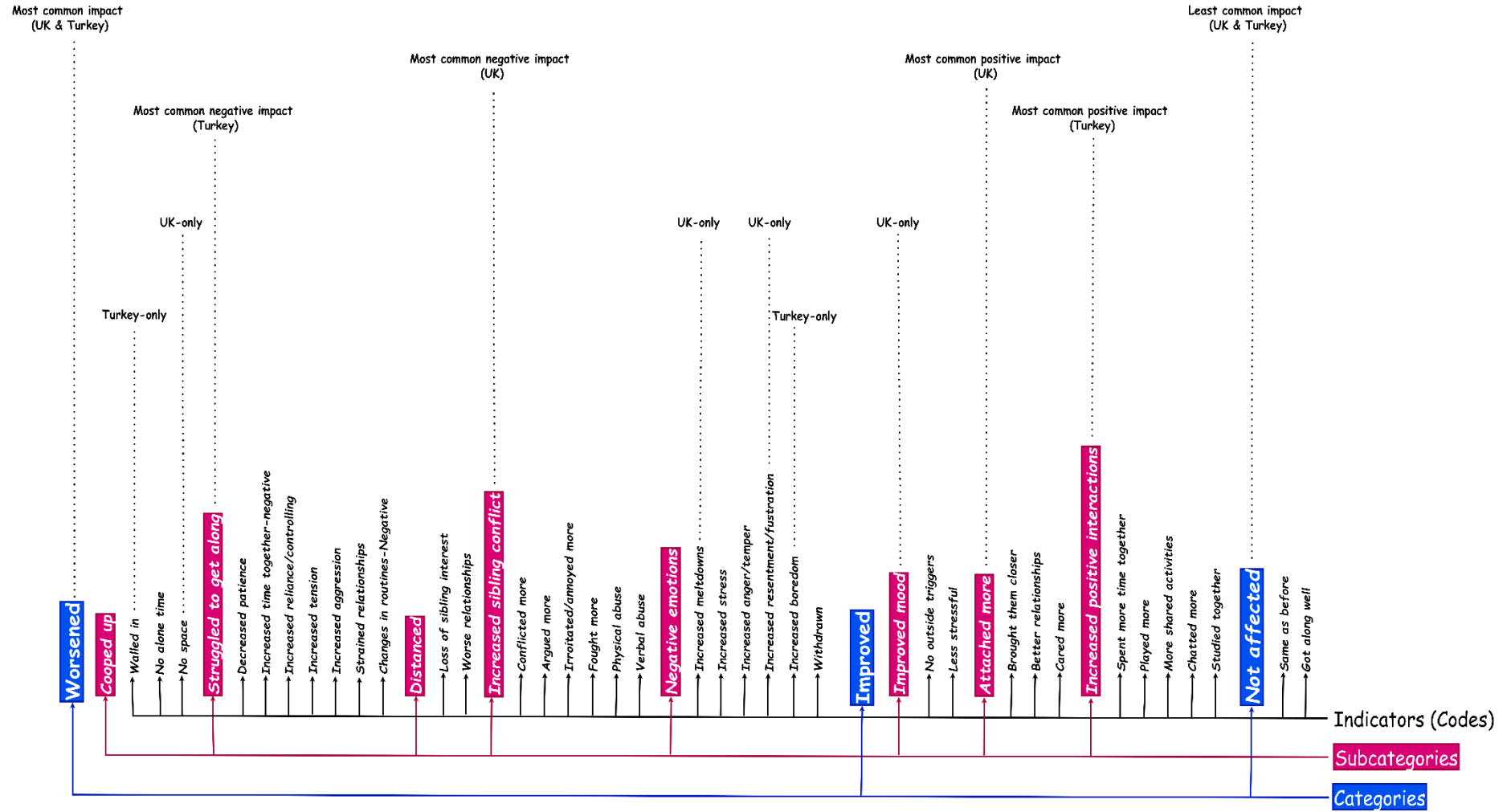
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<i>Conflicted more</i>	<i>16</i>	<i>2</i>	<i>More shared activities</i>	<i>6</i>	<i>4</i>
<i>Fought more</i>	<i>11</i>	<i>3</i>	<i>Spent more time together</i>	<i>9</i>	<i>10</i>
<i>Irritated/annoyed more</i>	<i>15</i>	<i>1</i>	<b><u>3. Not affected</u></b>	<b><u>26 (18%)</u></b>	<b><u>20 (22%)</u></b>
<i>Physical abuse</i>	<i>6</i>	<i>4</i>	<i>Same as before</i>	<i>22</i>	<i>18</i>
<i>Verbal abuse</i>	<i>4</i>	<i>1</i>	<i>Got along well</i>	<i>4</i>	<i>2</i>
<b><i>1.5. Negative emotions</i></b>	<b><i>11</i></b>	<b><i>13</i></b>			

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Figure 2 (7.2)

The Impact of Covid-19 on Sibling Relationships



### 7.3.1.1 Covid-19 Worsened Sibling Relationships

More than half of British and Turkish parents indicated that Covid-19 worsened (primary category) the sibling relationships of autistic adolescents with five common indicators (subcategories): 1) *cooped up*, 2) *distanced*, 3) *struggled to get along*, 4) *increased sibling conflict*, and 5) *negative emotions*. While British and Turkish parents agreed on the overall worsening impacts of Covid-19 on their children's sibling relationships and its five indicators, the extent to which each indicator contributed to an overall negative impact differed between British and Turkish families.

To British parents, the most common indicator of the negative impact of Covid-19 was increased sibling conflict between their autistic and non-autistic children. British parents indicated this with responses such as: "They have been arguing more" (BR033, mother); "They fight more" (BR-142, mother); "It has caused verbal name-calling" (BR165, mother). Although Turkish parents also mentioned increased sibling conflict during the pandemic, this was not the most common negative impact of the pandemic on Turkish siblings. To Turkish parents, the most common negative impact of Covid-19 was that it made it difficult for siblings to get along. Turkish parents described this as: "Tension and disagreement between them increased" (TR041, mother); "After a certain hour, he could not get along with his brother" (TR181, mother). Both British and Turkish parents indicated that the reason for deteriorated sibling relationships (i.e., sibling conflict in the British sample and struggles in getting along in the Turkish sample) was the increased amount of time siblings spent together all day every day: "They are spending more time together in the house, at home. They argue and fight more" (BR005, mother); "It was difficult to be together for a long time" (TR044, mother).

As expected, neither British nor Turkish parents used the word bullying when reporting the negative impacts of the pandemic on sibling relationships. However, looking at

the data more closely, potential signs of sibling bullying were identified in both cultures. For instance, a British parent said: “My autistic child has become bored and lonely and spends time picking on his siblings and annoying them” (BR077, mother). Similarly, a Turkish parent indicated signs of physical bullying perpetrated by the autistic child:

*My autistic child’s sensitivity to sound as well as his level of anxiety increased during this period. Anger and violence increased due to the lack of speech-verbal communication. He does not understand why we are forbidden to be outside, and he does not know why he is deprived of education 6 days a week. He cannot make sense of his sibling’s voices in the home environment. Anger because there is no space change, and then harms himself and his brother and shows physical violence against family members (TR003, mother).*

### **7.3.1.2 Covid-19 Improved Sibling Relationships**

Although the majority of parents indicated negative impacts of Covid-19 on their children’s sibling relationships, about a third of parents, in both cultures, mentioned that the pandemic also had positive impacts on their children’s sibling relationships. The story in this data drew a picture of two cross-culturally common (i.e., bonded more and increased positive interactions) and one British culture-specific (i.e., improved mood) indicator for the positive impact of Covid-19. More cross-cultural differences were identified in the most commonly reported indicators of the positive impact of Covid-19.

To British parents, the pandemic improved sibling relationships mostly due to the fact that children were emotionally attached and bonded more closely during the pandemic: “It actually made it stronger as they only had each other to play with” (BR170, mother); “The coronavirus has actually brought them closer” (BR150, mother). To Turkish parents, the most common indicator for improved sibling relationships was increased daily positive interactions between siblings: “More interactions and played together” (TR033, mother); “They started

playing better with each other” (TR082, mother). Additionally, British, but not Turkish parents, indicated improved sibling relationships due to autistic child’s improved moods and behaviours: “The children spent a lot more time together. My autistic son's behaviour did improve as the outside stressors in his life were removed and he did not attend school” (BR125, mother).

Although the most commonly reported positive impact of Covid-19 on sibling relationships differed between the two cultures, the main driven factor for improved sibling relationships during the pandemic seemed to be the school closures in both British and Turkish cultures. To British parents, school closures meant increased time spent together between siblings which improved their attachment and connection: “Now because of changes to the school schedule they are together most all day, every day. In their case, it's given them time to talk, work on projects, study, and play together. It's improved their connection” (BR092, mother). Some British parents also indicated that school closures reduced the amount of daily outside stressors that the autistic child faced which improved the mood and behaviours of the autistic child: which was then reflected in their sibling relationships “It has improved the relationship somewhat as we haven’t had to contend with outside stressors such as school for child with asd” (BR066, mother). The same pandemic-related reason, school closure, led to improved sibling relationships in Turkey too, but in a different way, namely increased positive interactions: “They have been home-schooled so more opportunities to play together” (TR001, mother)”. That is, the same pandemic-related factor, school closure, led to improved sibling relationships in both cultures, by following a different path (i.e., increased attachment in the British sample and increased positive interactions in the Turkish sample).

### 7.3.1.3 Covid-19 Did Not Affect Sibling Relationships

Interestingly, about one in five British and Turkish parents said Covid-19 had no impact on the sibling relationships of their children. For this, parents indicated that their children's sibling relationships stayed the *same as before* or that their children generally *get along well*. Parents who indicated that their children's sibling relationships stayed the same as before commonly pointed out that they were already bad before the pandemic, so the pandemic did not deteriorate them any more: "They weren't good anyway. Nothing has changed during the pandemic" (TR028, mother); "I don't think they disagreed any more through the pandemic than they usually do" (BR217, mother). Conversely, some parents indicated that sibling relationships were unaffected as their children get along remarkably well: *The two of them get along well and can take care of each other*" (BR015, mother); *We did not have any problems, the two siblings are very attached to each other, his sister is a friend to him, they are happy to be together* (TR064, mother). Engaging more closely with the data, it was found that the routine lives of those families, in general, were not affected by the pandemic and Covid-19 related measures (i.e., school closures): A Turkish parent described this as: "They were not affected at all, normal routine life continued" (TR006, mother). Similarly, a British parent said:

*My autistic son is going to school every day through his own choice. This has helped him immensely and has meant that he hasn't spent any additional time with his non-autistic sibling. In this respect, it hasn't had a huge impact on their relationship* (BR031, mother).

### 7.3.2 Parental Response to Sibling Bullying

As expected, potential signs of increased sibling bullying during the pandemic were identified when asking parents how Covid-19 affected their children's sibling relationships. Following up with this, parents were asked how they react or would react to sibling bullying

instances when/if witnessed. Based on parents' answers, three common parental interventions to sibling bullying were identified: *direct*, *indirect*, and *no intervention*. Most parents (British=86%, Turkish=83%) indicated that they would directly intervene in sibling bullying meaning that they would get involved immediately upon witnessing sibling bullying. In addition, although less frequent than direct intervention, nearly half of the British parents (44%) and more than a third of Turkish parents (37%) reported *indirect interventions* to sibling bullying such as teaching perspective taking. Finally, some parents, the least common, said that they would not get involved in the situation when witnessed sibling bullying (British=3%, Turkish=3%). Engaging with the data more closely enabled us to identify cross-cultural variations in the most common direct and indirect types of interventions parents preferred to apply. Cross-cultural differences are presented below and shown in Table 3 and Figure 3.

#### 7.3.2.1 *Direct intervention*

A vast majority of parents, over 80% in both cultures, reported that they would directly intervene in sibling bullying, when witnessed, indicating five types of direct interventions: 1) *step in*, 2) *explore the problem*, 3) *discipline*, 4) *cool-off*, and 5) *remind child(ren) of the rules*. Although most British and Turkish parents said they would directly intervene in sibling bullying, the most common type of direct intervention they preferred differed.

To British parents, the most preferred direct intervention was stepping into the situation directly and immediately when witnessing sibling bullying. British parents indicated six different ways in terms of how they step in to sibling bullying: 1) *tell them to stop*: "When they are behaving in the above way, I tell them to stop" (BR003, mother); 2) *stop the action*: "I will stop them in time" (BR091, mother); 3) *solve the issue*: "Try and solve the issue and make them stay separated for a while" (BR108, mother); 4) *intervene calmly*: "I will always



try to calmly intervene” (BR031, father); 5) *React angrily*: “I would get angry and yell at the normal kid who was bullying” (BR090, father); and 6) *Remove the conflict trigger*: “I hide the toy they are arguing about” (BR007, mother).

As hypothesised, the most common direct intervention Turkish parents preferred was taking disciplinary actions with the majority disciplining the bully as the first course of action. Turkish parents indicated six different disciplinary actions when they witnessed sibling bullying: 1) *discipline the bully*: “I would talk to my bullying child and tell him that he did it wrong” (TR121, mother); 2) *discipline both*: “I tell off both” (TR009, mother); 3) *discipline the non-autistic child*: “I warn my typically developing child” (TR147, mother); 4) *use or threat with punishment*: “if necessary, punish the guilty one” (TR068, father); 5) *revoke privileges*: “He had increased the violence even more recently. So, I said I wouldn't cook chicken at home until he stops this behaviour completely. His teacher also said that he would not play football and take physical education classes at school” (TR028, mother); and 6) *Make both apologise*: “I sweeten up the situation by making them apologise to each other” (TR039, mother).

### 7.3.2.2 *Indirect intervention*

Although the majority of parents said that they would intervene directly when witnessing sibling bullying, some parents also stated using indirect interventions, with British parents slightly more than Turkish parents (British=44%, Turkish=37%). In this regard, it was found that three indirect intervention styles were common in both cultures: 1) *improve understanding*, 2) *promote positive behaviours*, and 3) *prevent*. There was also a culture-specific indirect intervention, *addressing feelings*, reported by only British parents. Some cross-cultural differences were also observed in the most commonly preferred indirect interventions across the two cultures.

In the British sample, parents most commonly reported that they would promote positive behaviours in dealing with sibling bullying. This included *encouraging kindness* and *empathy*. For instance, some parents expressed that they would encourage empathy when they witness sibling bullying to help children take perspective: “I tried to tell the children how each other of them are feeling and what they would feel like if that was happening to them” (BR209, mother). Additionally, some other parents said that they would encourage kindness to promote positive behaviours: “We have been quick to intervene from the start if there was any type of physical or verbal aggression between them, reminding them both to be kind in words and touch” (BR075, mother); “They know bullying is not acceptable and wrong we talk about being kind to each other weekly” (BR021, mother). Furthermore, British parents also reported that they would address feelings which included expressing their own feelings over the situation and acknowledging their children’s feelings. Some British parents described this as: “I would explain I was disappointed and that he should protect his brother not bully him” (BR144, mother); “My typical reaction is take the younger child aside and listen to his frustrations about his older brother” (BR128, mother).

Turkish parents, however, were keener to improve their children’s understanding of the situation. This included the following parental reactions: 1) *promote understanding*, 2) *explain autism to the non-autistic child*, and 3) *explain the situation to the autistic child*. For instance, some parents said they would promote understanding of their non-autistic child: “I ask him to be understanding” (TR028, mother); “I tell him to try to understand his brother” (TR069, mother). Additionally, some parents said they would explain autism to their non-autistic child, “I try to explain to the non-autistic brother that his brother is not like us, he is a little different, so he should not be stubborn with him” (TR159, mother), while others preferred to explain the situation to the autistic child to promote their understanding: “I explain the situation to my autistic child” (TR017, mother).

### 7.3.2.3 *No intervention*

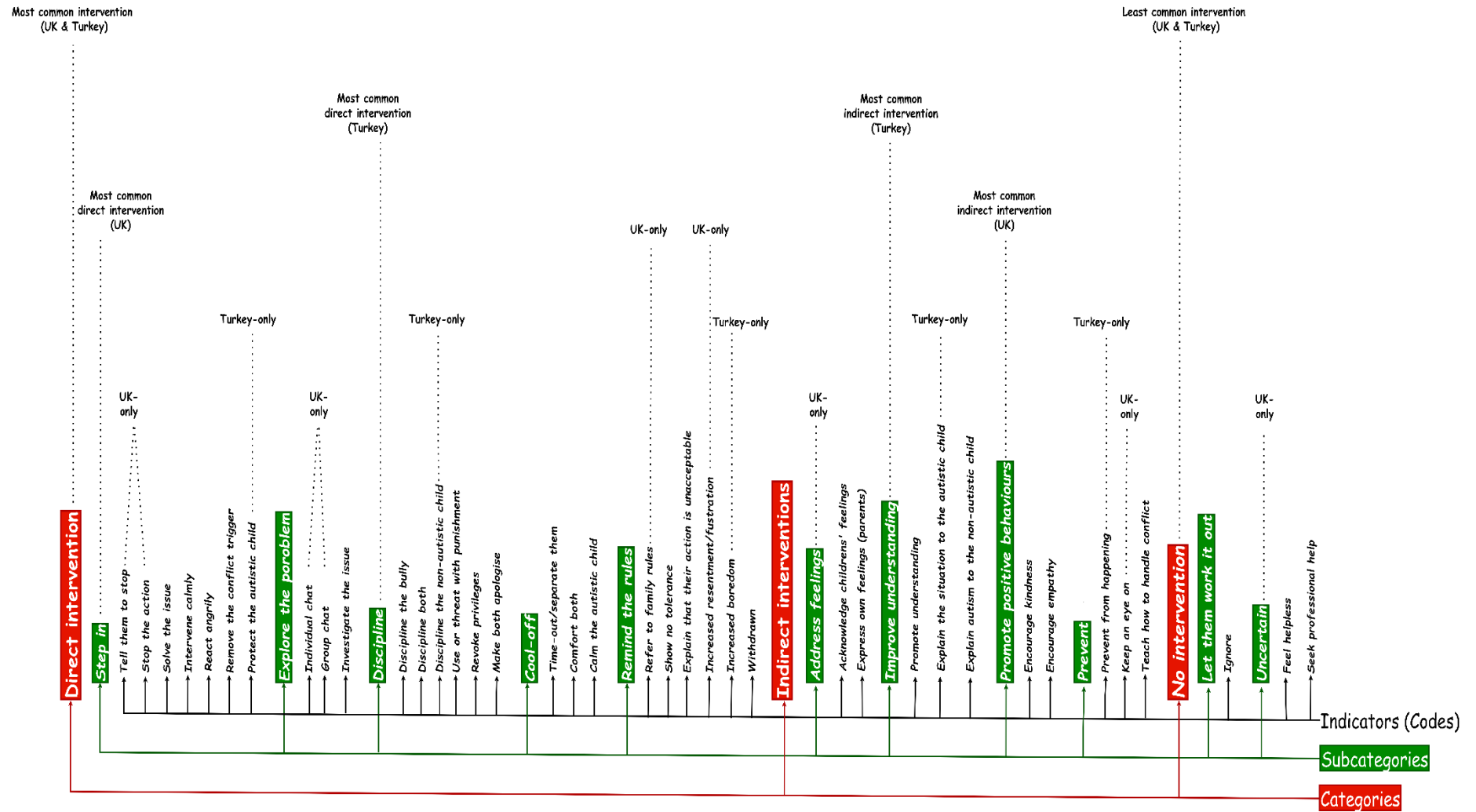
Although an overwhelming proportion of parents, from both cultures, indicated a direct or indirect intervention to sibling bullying, a few parents said that they prefer not to get involved when witnessing sibling bullying. Interestingly, the reasons that British and Turkish parents preferred not to intervene varied. For instance, Turkish parents mostly said they would *ignore* the situation to let children work it out between themselves while British ones said they would not intervene due to feeling uncertain about how to react, with some indicating need for professional help “Sometimes both of them should handle it without intervening” (TR118, mother); “I usually prefer not to intervene” (TR005, mother); “I feel torn and helpless” (BR197, mother); “Seek professional help from a psychologist” (BR135, mother).

**Table 3 (7.3)***Parents' Responses to Sibling Bullying: Codes, Subcategories, and Categories*

	British (N=147) Freq (%)	Turkish (N=60) Freq (%)		British	Turkish
<b><u>1. Direct Intervention</u></b>	<b><u>126 (86%)</u></b>	<b><u>50 (83%)</u></b>	<i>Refer to family rules</i>	6	2
<b><i>1.1. Step in</i></b>	<b>49</b>	<b>18</b>	<i>Show no tolerance</i>	7	2
<i>Tell them to stop</i>	12	0	<i>Explain that their action is unacceptable</i>	30	14
<i>Stop the action</i>	18	0	<b><u>2. Indirect Intervention</u></b>	<b><u>64 (44%)</u></b>	<b><u>22 (37%)</u></b>
<i>React angrily</i>	8	7	<b><i>2.1. Address feelings</i></b>	<b>11</b>	<b>0</b>
<i>Intervene calmly</i>	7	2	<i>Acknowledge children's feelings</i>	8	0
<i>Protect the autistic child</i>	0	4	<i>Express own feelings (Parents)</i>	3	0
<i>Solve the issue</i>	3	5	<b><i>2.2. Improve understanding</i></b>	<b>27</b>	<b>17</b>
<i>Remove the conflict trigger</i>	1	1	<i>Promote understanding</i>	6	5
<b><i>1.2. Explore the problem</i></b>	<b>34</b>	<b>4</b>	<i>Explain autism to the non-autistic child</i>	6	11
<i>Individual chat</i>	16	0	<i>Explain the situation to the autistic child</i>	0	4
<i>Group chat</i>	21	0	<b><i>2.3. Promote positive behaviours</i></b>	<b>37</b>	<b>13</b>
<i>Investigate the issue</i>	8	3	<i>Encourage kindness</i>	23	6
<b><i>1.3. Discipline</i></b>	<b>47</b>	<b>21</b>	<i>Encourage empathy</i>	14	7
<i>Discipline the bully</i>	13	9	<b><i>2.4. Prevent</i></b>	<b>3</b>	<b>3</b>
<i>Discipline both</i>	15	8	<i>Prevent from happening</i>	0	2
<i>Discipline the NT child</i>	0	3	<i>Keep an eye on</i>	1	0
<i>Use/threat with punishment</i>	7	3	<i>Teach how to handle conflict</i>	4	1
<i>Revoke privileges</i>	14	1	<b><u>3. No intervention</u></b>	<b><u>5 (3%)</u></b>	<b><u>2 (3%)</u></b>
<i>Make both apologise</i>	10	1	<b><i>3.1. Let them work it out</i></b>	<b>2</b>	<b>2</b>
<b><i>1.4. Cool-off</i></b>	<b>41</b>	<b>11</b>	<i>Ignore</i>	2	2
<i>Time-out/ separate them</i>	33	6	<b><i>3.2. Uncertain</i></b>	<b>5</b>	<b>0</b>
<i>Comfort both</i>	6	4	<i>Feel helpless</i>	4	0
<i>Calm the autistic child</i>	5	2	<i>Seek professional help</i>	1	0
<b><i>1.5. Remind the rules</i></b>	<b>40</b>	<b>16</b>			

Figure 3 (7.3)

Parents' Responses to Sibling Bullying



## **7.4 Discussion**

Using a cross-cultural sample, this qualitative study explored how British and Turkish parents perceived the impact of Covid-19 on their autistic and non-autistic child's sibling relationships. Additionally, it also examined how British and Turkish parents respond to sibling bullying, predicting that the pandemic would increase the instances of sibling bullying in both cultures. Overall, more cross-cultural similarities than differences were found in the effects of Covid-19 on sibling relationships of autistic adolescents and parents' responses to sibling bullying across the two cultures. Discussion of the findings follows the Etic approach, meaning that only the absence and presence of cross-cultural variations are emphasised (Kagitcibasi & Berry, 1989).

### ***7.4.1 Impact of Covid-19 on Sibling Relationships***

For the first time, this cross-cultural study identified three distinct impacts of the pandemic on sibling relationships of autistic adolescents, namely worsened, improved, and not affected. Closely supporting the current finding, a single-culture study, from the general population, has also shown a triple impact of the pandemic, worsened, improved, or not impacted, on sibling relationships of Canadian adolescents (Martin-Storey et al., 2021). Similarly, reports from China have also indicated a double-edged impact of the pandemic—positive and negative—on sibling relationships of children and adolescents (Jiang et al., 2023; Tang et al., 2022). Moreover, some other researchers across the globe have also found either negative, positive, or no impact of the pandemic on sibling relationships (Cassinat et al., 2021; Stadheim et al., 2022; Sun et al., 2021; Toseeb, 2022; Zhang et al., 2022). Taken together, providing the first cross-cultural perspective, the current study suggests that Covid-19 has had not only negative but also positive or no impact on the sibling relationships of autistic adolescents and that this three-fold effect appears to be consistent across Western and non-Western cultures.

Although the majority of British and Turkish parents reported a negative impact of the pandemic on sibling relationships, the way Covid-19 related factors led to a negative impact differed across the two cultures. For instance, more British than Turkish parents reported increased sibling conflict, flagging it as the driving factor for deteriorated sibling relationships. In Turkish culture, the main driving factor for deteriorated sibling relationships was flagged as struggles in getting along. Previous research supports both findings as they have indicated increased sibling conflict in the UK and increased struggles in getting along in Turkey (Sancili & Tugluk, 2021; Toseeb, 2022). Further aligning with this, a recent study also indicated higher sibling bullying rates in the British than in Turkish culture during the pandemic (Deniz & Toseeb, 2023). This highlights the importance of considering cultural dynamics when examining the impact of the pandemic on family dynamics. More research following the Emic approach (i.e., in-depth testing of culture-level differences) is needed to clarify the potential cultural reasons underlying such differences found in the current study.

While the most common negative impact of the pandemic differed between the two cultures, one may be the leading cause of the other. Although not analysed in the current study, due to following the Etic approach, one might speculate that siblings' struggles in getting along may have led to increased sibling conflict more often in the British than in the Turkish culture. Two potential reasons could be anticipated for this namely, individualism/collectivism and parental supervision in British and Turkish families. For instance, British siblings are individualistic while their Turkish counterparts are collectivist which means an increased need for autonomy and independence in the British than Turkish families. Based on this, one might argue that the pandemic-related disruptions to individuals' personal space and private time might have led to higher sibling conflict in British, than Turkish, culture. Additionally, although both British and Turkish mothers spent more time with their children during the pandemic than pre-pandemic, Turkish mothers reported higher

parental supervision than British mothers. Based on this, one might argue that the extra time that Turkish mothers were spending with their children potentially prevented siblings' struggles in getting along leading to sibling conflicts (Tucker et al., 2014; Wolke et al., 2015). It is crucial to note that the current arguments are only speculations and, therefore, more research is needed to support these arguments.

#### **7.4.2 Parental Interventions to Sibling Bullying**

For the first time, this study unpacked three cross-culturally common parental responses to sibling bullying: *direct*, *indirect*, and *no intervention*. Overall, the current findings are in line with previous reports. For instance, McHale et al. (2000) conceptualised three common parental interventions for sibling conflict which closely resemble the current findings: *non-involvement*, *intervene*, and *coach*. Similarly, Kramer et al. (1999) also found that American parents apply similar responses when witnessing sibling conflicts such as *no intervention* (e.g., *passive active no intervention*), *direct intervention* (e.g., *commands to stop the fight*, *collaborative problem solving*), and *indirect intervention* (e.g., *exploring emotions*). Moreover, Tucker and Kazura (2013) identified three common categories of parental responses to sibling bullying, two of which are well aligned with the intervention styles conceptualised in the present study: *no intervention* (*non-intervention*; *ignore*, *do not pay attention*); *indirect intervention* (*child-centred*; *help them negotiate*, *teach them*, *explain the other child's feelings*). Although none of these studies was cross-cultural, triple parental intervention styles to sibling bullying – *no intervention*, *direct intervention*, *indirect intervention*– appear to be a universal parental catalogue for intervening in sibling conflict and bullying.

In both British and Turkish cultures, the most common parental intervention for sibling bullying was direct intervention where the parent immediately stepped into the situation. The existing literature, although based on sibling conflict not bullying, contradicted



the current findings. For instance, American parents were found to be more inclined towards indirect interventions (i.e., coaching) than directly intervening in sibling conflict when witnessed (Milevsky et al., 2011). Similarly, others have also found that most parents prefer not to intervene (Kramer et al., 1999; Martin & Ross, 1995) or indirectly intervene (Tucker & Kazura, 2013) when witnessing sibling conflict. One might suggest two reasons for this inconsistency. First, parental awareness of sibling bullying has recently increased as researchers have found moderate agreement between child-report and parent-report sibling bullying rates (Dantchev & Zemp, 2022) compared to low agreement found in the past (Durán et al., 2017; Holt et al., 2008). This increased parental awareness might have encouraged parents to take more direct actions to prevent the detrimental impacts of sibling bullying. Second, all previous findings regarding how parents intervene in sibling bullying come from the non-autistic population. Therefore, it may be that the social communication difficulties experienced by autistic individuals may be leading parents to take direct interventions more often than indirect interventions to defuse sibling bullying.

British and Turkish parents differed in terms of the use of direct and indirect intervention styles. In regard to direct interventions, most British parents preferred to directly step into the situation (e.g., stop the bullying action), while Turkish parents tended to take disciplinary actions. One might link this difference to the different parenting styles between British and Turkish families. For instance, in child-rearing, Turkish parents show more negativity and apply disciplinary measures (e.g., punishment, verbal criticism) more often than British parents (Aytac et al., 2019; Gürmen & Kılıç, 2022) which may be the reason that most Turkish parents chose to take disciplinary measures. In terms of indirect interventions, acknowledging feelings, both children's and parents', was an indirect intervention style specifically used by British but not Turkish parents. Addressing children's feelings has frequently been found as a parental strategy to deal with sibling conflict, although the

existing evidence comes primarily from Western cultures (Kramer et al., 1999; McHale et al., 2000; Milevsky et al., 2011; Tucker & Kazura, 2013). Based on this, it could be argued that addressing children's feelings may be a Western-specific parental strategy to deal with sibling conflict, although more non-western studies are needed to support this argument. To conclude, the differences in the parental responses to sibling bullying may be due to cross-cultural differences in parenting and child-rearing styles.

#### ***7.4.3 Strengths and Limitations***

The current study holds several strengths and limitations. In terms of its strengths, having sufficiently large samples from both cultures, improved the cross-cultural comparability. Moreover, the data coder in the current study was a bilingual speaker of both Turkish and English languages and had living experience in both cultures which potentially improved the engagement of the coder with the data. There were also a number of limitations. First, the current sample is mainly formed by mothers, thus, British and Turkish fathers' views were underrepresented. Second, having a relatively larger sample of British parents, compared to Turkish parents, might have affected the degree of representation of Turkish parents in the reported cross-cultural comparisons. Third, this study focused on autistic adolescents' sibling relationships with their closest aged non-autistic sibling, thus, the current findings do not inform about the relationships of autistic adolescents with other or multiple siblings. Finally, the current study focused on parents' perceptions which do not represent the lived experiences of autistic adolescents in terms of the impacts of Covid-19 on their sibling relationships. Thus, all findings should be evaluated within these strengths and limitations.

#### ***7.4.4 Conclusions and Suggestions***

Overall, the current findings showed that Covid-19 negatively affected sibling relationships in most families of autistic adolescents in both cultures. In terms of parental responses to sibling bullying, most British and Turkish parents indicated directly intervening

in sibling bullying when witnessed, which has not been found in other previous studies. This suggests a potential increase in parents' awareness of sibling bullying from the past to the present. Differences in parenting styles potentially led to the differing direct parental interventions to sibling bullying (British= step in directly, Turkish= take disciplinary actions).

The current study suggests that parental awareness of such negative impacts of the pandemic on sibling relationships could potentially buffer the aftermath of the pandemic. Finally, effective parental interventions to negative sibling interactions, such as sibling bullying, are also likely to reduce the likelihood of such events repeating in the future. At times when parents struggle with how to handle sibling bullying, seeking professional support may be more beneficial than ignoring the situation or letting children work it out between themselves.

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## **Chapter 8: Key Findings, Integrated Discussion, and General Conclusions**

This chapter summarises the key findings of the current thesis and provides an integrated discussion within the scope and limitations of the existing literature. The integrated findings and subsequent discussions and conclusions mainly focus on the following: 1) the prevalence of sibling bullying, 2) direct and indirect correlates of sibling bullying, 3) the impacts of Covid-19 on sibling relationships and bullying, and 4) parental responses to sibling bullying in British and Turkish families of autistic adolescents. The etic approach, a theoretical framework in cross-cultural psychological research (Kagitcibasi & Berry, 1989), is followed in the presentation and discussion of cross-cultural similarities and differences between the two cultures. That said, the following key findings and discussions merely consider between-culture variations on measured psychological phenomena (e.g., prevalence and correlates of sibling bullying) instead of focusing on potential reasons underlying such cross-cultural differences. Taking the current findings into account, future researchers may wish to follow the emic approach to explore the potential reasons underlying such cross-cultural similarities and variations reported in the current thesis. Strengths, limitations, implications, and future directions are also presented.

### **8.1 Summary of Key Findings**

#### ***8.1.1 Prevalence and Correlates of Sibling Bullying Across Cultures***

In the current thesis, findings showed that sibling bullying is highly prevalent in both British and Turkish families of autistic adolescents as approximately two-thirds experienced sibling bullying every week. In both cultures, autistic adolescents were more likely to be perpetrators (British= 65%, Turkish= 56%), than victims (British: 53%, Turkish=45%), of sibling bullying. The most common bullying role for autistic adolescents, from both cultures,

was being the bully-victim (British=46%, Turkish=33%), while the least common bullying role was being the victim-only (British=7%, Turkish=12%).

Additionally, a wide range of correlates – potential risk factors – of sibling bullying were identified, more in the British compared to the Turkish culture (see, Table 1). In the case of sibling bullying victimisation, being a male, having an opposite-gendered sibling, having a physically stronger sibling, and being a perpetrator of sibling bullying in the past appears to be associated with increased rates of sibling bullying victimisation in British, but not Turkish, autistic adolescents. Additionally, increased parental education, i.e., college or above degree, seems to be associated with an increased risk of sibling bullying victimisation in Turkish, but not British, families of autistic adolescents. Furthermore, both British and Turkish autistic adolescents who were victimised by a sibling in the past were more likely to be victimised by a sibling in the present compared to those who were not victimised before.

In terms of sibling bullying perpetration, having a physically weaker sibling was associated with increased sibling bullying perpetration in British, but not Turkish, autistic adolescents. Additionally, having a younger sibling increased the likelihood of bullying a sibling for Turkish, but not British, autistic adolescents. Moreover, both British and Turkish autistic adolescents who were victimised by a sibling or bullied a sibling in the past were more likely to bully a sibling in the present compared to those who did not perpetrate a sibling in the past. Adding to this, British, but not Turkish, autistic adolescents who had low autistic traits (i.e., high functioning) were more likely to be victimised by a sibling than those with high autistic traits (i.e., low functioning). More findings from a British-only sample (Study II) also indicated that British autistic adolescents who had a shared bedroom were more likely to be victimised by a sibling than those who had their own bedroom. Finally, British autistic adolescents who had a late autism diagnosis were more likely to be perpetrators of sibling bullying than those who had an early diagnosis of autism.

**Table 1 (8.1)**

*Overview of significant correlates – potential risk factors – of sibling bullying across cultures*

	Sibling Bullying Victimisation		Sibling Bullying Perpetration	
	British	Turkish	British	Turkish
Individual-level	<ul style="list-style-type: none"> <li>• Low autistic traits (i.e., being high functioning).</li> <li>• Shared bedroom*</li> <li>• Gender (i.e., being a boy)</li> <li>• Having an opposite-gendered sibling (i.e., male/female)</li> <li>• Power imbalance (i.e., being weaker)</li> <li>• Past sibling bullying victimisation</li> <li>• Past sibling bullying perpetration</li> </ul>	<ul style="list-style-type: none"> <li>• Past sibling bullying victimisation</li> </ul>	<ul style="list-style-type: none"> <li>• Late diagnosis*</li> <li>• Power imbalance (i.e., being stronger)</li> <li>• Past sibling bullying victimisation</li> <li>• Past sibling bullying perpetration</li> </ul>	<ul style="list-style-type: none"> <li>• Sibling's age (i.e., having younger sibling)</li> <li>• Past sibling bullying victimisation</li> <li>• Past sibling bullying perpetration</li> </ul>
Family-level		<ul style="list-style-type: none"> <li>• Parental education (i.e., college or above)</li> </ul>		

Note. \* These findings are from Study II which was performed on a British-only sample.

### ***8.1.2 Sibling Bullying and Mental Health: Direct and Indirect Links***

In the current thesis, Study II (cross-sectional, cross-cultural) and Study III (longitudinal, British-only) tested whether sibling bullying is a direct or indirect risk factor for mental health difficulties in British and Turkish autistic adolescents. Significant indirect links between sibling bullying and mental health are summarised in Table 2.

In terms of indirect correlations, in British autistic adolescents, increased rates of sibling bullying, either victimisation or perpetration, were indirectly associated with increased internalising problems through reduced emotional functioning (i.e., emotion regulation and self-esteem). Additionally, sibling bullying perpetration was indirectly associated with increased externalising problems through detrimental social behaviours. On the Turkish side, both sibling bullying victimisation and perpetration were indirectly linked to



increased internalising and externalising problems through increased detrimental social behaviours. Finally, no indirect association was found between sibling bullying and mental health through positive social functioning, in either culture. To note, all tested indirect associations, in Study II, were based on cross-sectional data reported by parents.

**Table 2 (8.2)**

*Indirect Links Between Sibling Bullying and Mental Health*

<b>Paths</b>	<b>Turkish</b>	<b>British</b>
Sibling Victimization → Emotion Regulation → Inter. Prob.	No	<b>Yes (cross-sectional)</b>
Sibling Victimization → Emotion Regulation → Exter. Prob.	No	No
Sibling Perpetration → Emotion Regulation → Inter. Prob.	No	<b>Yes (cross-sectional)</b>
Sibling Perpetration → Emotion Regulation → Exter. Prob.	No	No
Sibling Victimization → Social Functioning → Inter. Prob.	No	No
Sibling Victimization → Social Functioning → Exter. Prob.	No	No
Sibling Perpetration → Social Functioning → Inter. Prob.	No	No
Sibling Perpetration → Social Functioning → Exter. Prob.	No	No
Sibling Victimization → Det. Social Behaviours → Inter. Prob.	<b>Yes</b>	No
Sibling Victimization → Det. Social Behaviours → Exter. Prob.	<b>Yes</b>	No
Sibling Perpetration → Det. Social Behaviours → Inter. Prob.	<b>Yes</b>	<b>Yes (cross-sectional)</b>
Sibling Perpetration → Det. Social Behaviours → Exter. Prob.	<b>Yes</b>	<b>Yes (cross-sectional)</b>
Sibling Victimization → Self-Esteem → Inter. Prob.	Not Tested	<b>Yes (longitudinal)</b>
Sibling Victimization → Self-Esteem → Exter. Prob.	Not Tested	<b>Yes (longitudinal)</b>
Sibling Perpetration → Self-Esteem → Inter. Prob.	Not Tested	<b>Yes (longitudinal)</b>
Sibling Perpetration → Self-Esteem → Exter. Prob.	Not Tested	<b>Yes (longitudinal)</b>
Sibling Victimization → Self-Esteem → Wellbeing	Not Tested	<b>Yes (longitudinal)</b>
Sibling Perpetration → Self-Esteem → Wellbeing	Not Tested	<b>Yes (longitudinal)</b>

There were also direct links between sibling bullying and mental health. For instance, increased sibling bullying victimisation was directly linked to increased internalising and

externalising problems in British autistic adolescents. On the Turkish side, however, increased rates of sibling bullying victimisation were a direct correlate of increased internalising but not externalising problems. On the contrary, while sibling bullying perpetration was a direct correlate of both internalising and externalising problems in the Turkish culture, it was only directly related to externalising problems in the British culture.

In summary, cross-sectional findings (Study II) indicated both direct and indirect correlations between sibling bullying and mental health through emotional dysfunction (British) and social dysfunction (British & Turkish). Additionally, longitudinal findings (Study III) supported the cross-sectional findings by indicating significant indirect associations between sibling bullying and mental health and wellbeing through emotional dysfunction. Finally, the longitudinal findings also indicated no direct associations between sibling bullying and mental health suggesting that sibling bullying may have short-term-only direct effects (see, Study II) on the mental health of autistic adolescents.

### ***8.1.3 Triggering Impacts of Covid-19 on Sibling Bullying and Parental Interventions***

In the current thesis, Study IV investigated the potential impacts of Covid-19 on sibling relationships of British and Turkish families of autistic adolescents. Findings from both cultures indicated three types of impact of Covid-19 on sibling relationships: *Worsened*, *improved*, and *not affected*. The majority of both British and Turkish parents reported that Covid-19 worsened sibling relationships at their homes. Of these, some parents mentioned that this was partly due to the increased instances of sibling conflict at home since the onset of the pandemic. Given that this was an expected finding, parents were also asked how they handled sibling bullying, when witnessed. On this, British and Turkish parents showed great similarities in the way they handled sibling bullying. More precisely, the majority of both British and Turkish parents reported that they would directly intervene in sibling bullying

when witnessed. This included: stepping in, exploring the problem, disciplining, cool-off, and reminding the child(ren) of the rules.

## **8.2 Integrated Discussion**

### ***8.2.1 Sibling Bullying Is Highly Prevalent***

To the best of my knowledge, the current thesis is the first to report the prevalence of sibling bullying in autistic adolescents in a cross-cultural context. In the current thesis, parent reports indicated that more than two-thirds of British and Turkish autistic adolescents experience sibling bullying. This finding well aligns with a previous report from the UK in which two-thirds of British autistic adolescents self-reported being involved in sibling bullying at least once a week (Toseeb et al., 2018). It also aligns with some findings from the general population; for example about two-thirds of adolescents from the US also self-reported being involved in sibling bullying (Skinner & Kowalski, 2013). However, there is also contradicting evidence in the literature as lower rates also have been reported by previous studies. For example, previous researchers in the general population have commonly reported a rate of sibling bullying ranging from 30% to 50% (Duncan, 1999; Finkelhor et al., 2006; Wolke & Skew, 2012; Wolke et al., 2015). Notwithstanding, previous reports from China have reported even lower rates of sibling bullying ranging from 10% to 20% (Liu et al., 2021; Peng et al., 2022; Qing et al., 2022). Given the scale of the inconsistency between previously reported estimates of sibling bullying, the current findings take its place in these inconsistencies.

The inconsistencies in the prevalence estimates of sibling bullying could be attributed to numerous factors one of which is the differences in the measurement of sibling bullying (Brett et al., 2023; Wolke et al., 2015). Another reason for this variation may be the potential cross-cultural differences in the rates of this particular phenomenon (Brett et al., 2023; Sabah et al., 2022). Hence, although Turkey is classified as a non-Western culture, the prevalence of

sibling bullying appears to be almost as high as what is observed in Western cultures, despite lower rates measured in non-Western societies such as China. However, more research is needed to replicate the current findings given that this has been the first systematic reporting of sibling bullying in Turkish adolescents.

### ***8.2.2 The Risk of Sibling Bullying Potentially Heightens When A Sibling Has Autism***

Although not measured directly, the very high prevalence of sibling bullying found in the current thesis, about two-thirds, points towards potentially heightened risks for sibling bullying in families where a child is autistic compared to non-autistic child families. This is not a new finding as previous studies have already suggested that autistic adolescents are more likely to be involved in sibling bullying compared to non-autistic adolescents both outside their homes (Humphrey & Hebron, 2015; Nowell et al., 2014; Wainscot et al., 2008) and at home (Toseeb et al., 2018, 2020a). The exact reasons why autistic adolescents are at heightened risk for being involved in bullying than their non-autistic peers, both in family and outside family, is not yet clear cut as there may be numerous factors leading to this. However, the theoretical framework of the current thesis<sup>1</sup>, together with the limited evidence in the literature, collectively point towards two dimensions: individual-level factors and family-level factors (Bronfenbrenner, 1979; Hawley, 1999; Milton, 2012; Patterson et al., 1967; Toseeb et al., 2018, 2020a). That said, there is an increased risk for sibling bullying in families where a child is autistic and this risk appears to be driven by both individual and family-level factors.

To begin with, social communication<sup>2</sup>, behavioural<sup>3</sup>, and emotional<sup>4</sup> difficulties accompanying autism are likely to be triggers of the increased risks of sibling bullying in such families. Looking more closely, social communication difficulties of autistic individuals

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<sup>1</sup> i.e., coercion theory, resource control theory, ecological systems theory, double empathy problem theory.

<sup>2</sup> e.g., receptive and expressive language, empathy, taking another's perspective, restricted social interest.

<sup>3</sup> e.g., coercive and aggressive behaviours, temperament, behavioural dysregulation.

<sup>4</sup> e.g., emotion dysregulation, impulsivity, internalising and externalising problems.

such as deficits in theory of mind, empathy, prosociality, social awareness, reading social cues, verbal ability, and communication have been shown to put autistic individuals at increased risks of being involved in bullying both outside (Bauminger, 2002; Cappadocia et al., 2012; Cook et al., 2010; Fox & Boulton, 2005; Gini et al., 2007; Humphrey & Hebron, 2015; Paul et al., 2018; Sreckovic et al., 2014; Sterzing et al., 2012; Van Roekel et al., 2010) and at home (Toseeb et al., 2020a). In terms of behavioural problems, excessive aggression, tantrum, anger, explosiveness, and lack of emotional control shown by autistic individuals (Mascha & Boucher, 2006; Petalas et al., 2012) have been found to be sparks of bullying both outside home (Kloosterman et al., 2014; Rieffe et al., 2012; Zablotsky et al., 2013) and at home (Button & Gealt, 2010; Toseeb et al., 2018). Finally, autistic children show higher levels of emotional distress, peer problems, hyperactivity, conduct problems, fear and deficits in executive function skills (e.g., emotion regulation) than their non-autistic peers which increase their likelihood of being targeted by bullies both outside (Cappadocia et al., 2012; Hebron & Humphrey, 2014; Paul et al., 2018; Rieffe et al., 2012; Sterzing et al., 2012) as well as at home (Bowes et al., 2014; Toseeb et al., 2018). Consequently, a range of difficulties accompanying autism seems to put autistic individuals at an increased risk of being involved in bullying both outside the home and at home.

Despite the fact that social, behavioural, and emotional difficulties experienced by autistic individuals heighten their risks for bullying involvement, it is important to note that the severity of autistic traits is negatively correlated with sibling bullying victimisation. More specifically, both current findings (i.e., Study II and Study III) and previous studies (Libster et al., 2022; Nowell et al., 2014; Rowley et al., 2012; Zablotsky et al., 2014) have shown that autistic individuals who show better social communication, behavioural, and emotional functioning are at heightened risks for being victimised than those with more severe autistic traits. This is likely because better-functioning autistic individuals show greater social

interest, spend more time with their peers and siblings, and have more social interactions with them than those with lower functioning which, in turn, increases risks for bullying for those individuals (Libster et al., 2022; Rowley et al., 2012; Toseeb, 2022). Hence, social communication, behavioural, and emotional difficulties associated with autism seem to heighten risks for bullying involvement, though, the severity of the risk appears to be greater for individuals with milder, than severe, autistic traits.

Finally, parents may also play a role in increased risks of sibling bullying in families where a child is autistic. For instance, there is increased parental differential treatment and favouritism in families where a child is autistic (Meyer & Vadasy, 1997; Mokoena & Kern, 2022; Nealy et al., 2012), also found in Study IV ([Chapter 7](#)), which reinforces subsequent bullying behaviours of the non-autistic sibling (Bouchard et al., 2019; Bouchard & Sonier, 2021; Kramer & Chung, 1999; Tucker & Kazura, 2013; Updegraff et al., 2005). Additionally, increased rates of parental stress, burnout, and emotional difficulties (Enea & Rusu, 2020; Hayes & Watson, 2013; Johnson et al., 2011; Hall & Graff, 2011) as well as increased parent-child conflict and inter-parental conflict in such families (Chan & Leung, 2020; Hartley et al., 2019; Sim et al., 2016) further trigger sibling bullying instances in such families (Eriksen & Jensen, 2009; Tippett & Wolke, 2015; Tucker et al., 2014a). Furthermore, higher levels of marital separation and divorce in families where a child is autistic (Hartley et al., 2010) are likely to be another factor triggering sibling bullying (Qing et al., 2022; Tucker et al., 2014a). Finally, increased harsh parenting and parental maltreatment and neglect in families where a child is autistic (Chan & Lam, 2016; McDonnell et al., 2019) may be another parent-related factor increasing rates of sibling bullying in such families (Bowes et al., 2014, Eriksen & Jensen, 2009; Tippett & Wolke, 2015, Toseeb et al., 2018; Tucker et al., 2014a; Updegraff et al., 2005). To conclude, parental characteristics seem to play a role in the heightened risks of sibling bullying in families where a child is autistic.

### ***8.2.3 Correlates of Sibling Bullying Vary Across Cultures***

In light of the etic approach (Kagitcibasi & Berry, 1989) and the Ecological Systems Theory (Bronfenbrenner, 1979), the current thesis, for the first time, suggested that the precursors of sibling bullying show cross-cultural variations. More specifically, current findings have shown that British autistic adolescents are exposed to a higher number of individual risk factors than their Turkish peers. Aligning with the existing literature (Bowes, 2014; Dantchev & Wolke, 2019; Dantchev et al., 2019; Hoetger et al., 2015; Menesini et al., 2010; Tippett & Wolke, 2015; Toseeb et al., 2018, 2020a; Tucker et al., 2013a, 2014a, Wolke et al., 2015) being male, physical power imbalance, and siblings' gender composition were found to be risk factors for increased sibling bullying, victimisation or perpetration, in British autistic adolescents. However, none of these were risk factors for Turkish autistic adolescents. Instead, again aligning with previous evidence (Tippett & Wolke, 2014; Tucker et al., 2014a) higher parental education seemed to increase the risk for sibling bullying victimisation while having a younger sibling (Menesini et al., 2010; Toseeb et al., 2018) increased risks for sibling bullying perpetration in Turkish autistic adolescents. Again, these factors were not correlates of sibling bullying in British families. Hence, the precursors of sibling bullying appear to vary between British and Turkish families of autistic adolescents, though the reasons for this have remained largely unknown.

Although the current thesis aimed to report the cross-cultural variations at the psychometric scale level<sup>5</sup>, some speculations could be made on the potential reasons for such differences. Looking more closely at the current findings, one might argue that the cross-cultural differences in the prevalence of sibling bullying may be due to culture-specific risk and protective factors of sibling bullying. For instance, there appears to be a higher number

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<sup>5</sup> i.e., Etic approach.

of individual-level predictors of sibling bullying in British<sup>6</sup> than in Turkish<sup>7</sup> families of autistic adolescents. This is, British autistic adolescents are exposed to more risk factors which makes them more prone to sibling bullying compared to their Turkish peers. Similarly, there may be increased family-level protective factors of sibling bullying in Turkish, compared to British, families of autistic adolescents. As an example, an overwhelming majority of Turkish parents were found to have low educational degrees (i.e., below college), which was negatively associated with sibling bullying rates in the current as well as in previous findings (Eriksen & Jensen, 2006; Tucker et al., 2014a). Supporting this with the findings from Study IV ([Chapter 7](#)), it appears that lower parental education in Turkish parents indicates higher parental supervision (i.e., spending more time with their children) compared to the British parents who showed higher parental education and lower parental supervision. Based on this, although not clear, one could speculate that parents with lower educational degrees may be more likely to be stay-at-home parents which potentially protects children against sibling bullying due to increased parental supervision (Eriksen & Jensen, 2006; Tucker et al., 2014a). Hence, cross-cultural differences in the precursors of sibling bullying may, to some extent, explain the cross-cultural variations in the prevalence of sibling bullying.

#### ***8.2.4 There Are Indirect Paths From Sibling Bullying To Mental Health***

Perhaps the most striking finding of the current thesis is showing, for the first time, that sibling bullying leads to poor mental health and wellbeing through social and emotional dysfunction in British and Turkish autistic adolescents. These findings are novel in the existing literature as they suggest that, for the first time, factors that link sibling bullying to mental health are likely to show cross-cultural variations. Although this has been the first

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<sup>6</sup> i.e., gender, power imbalance, siblings' gender composition, past sibling bullying experiences.

<sup>7</sup> i.e., having a younger sibling and past sibling bullying experiences.



systematic reporting of the indirect relations between sibling bullying and mental health, these newly explored indirect paths, to some extent, get their roots in the existing literature. Finally, with the current findings, the cross-cultural variations in the relationship between sibling bullying and mental health have now become a matter of concern and their reasons are yet to be unpacked.

The current findings suggest an indirect link between sibling bullying and mental health through emotion regulation which closely aligns with existing evidence as this path had already been discovered in the Western general population (Fite et al., 2022). More supporting evidence existed in the peer bullying literature attributing a mediator role to emotion regulation in between victimisation and mental health (Schwartz & Proctor, 2000). There are potentially numerous reasons that explain how emotion regulation plays a role in the relationship between sibling bullying and mental health. Perhaps the clearest link was made by Kennedy and Kramer who argued that *“The ability to engage in appropriate social behaviors rests strongly on one’s ability to manage emotional experiences and behaviors”* (2008, p.568). On this, they have suggested that poorly regulated frustration, anger, or other negative emotions are likely to trigger subsequent sibling bullying instances. Aligning with this argument, researchers have found that individuals who perpetrate a sibling show low capacity to regulate their emotions and show emotional instability (Menesini et al., 2010; Toseeb et al., 2020b). In terms of sibling victimisation, researchers previously suggested that being victimised by a sibling decreases self-compassion, an emotion regulation strategy (Játiva & Cerezo, 2014). Reduced emotion regulation, as a result of perpetrating a sibling or being victimised by a sibling, leads to increased mental health difficulties (Mazefsky et al., 2014; McLaughlin et al., 2011). Finally, it comes to the attention that the link between sibling bullying and emotion regulation, suggested by previous research – including the current findings – comes from Western cultures. That is, there may be a possibility that the link

between sibling bullying and mental health through emotion regulation is specific to Western populations. However, more research is needed to explore why this is the case, if at all.

The current findings also showed that sibling bullying, victimisation (Turkish only) and perpetration (British and Turkish), had indirect routes to mental health through detrimental social behaviours. Based on these findings, one might argue that bullying a sibling may be a greater indirect risk factor for the mental health of British autistic adolescents than being victimised by a sibling. Although no previous research has specifically tested this, perhaps some foundational roots already existed in proxy outcomes. For instance, previous researchers have suggested a link between increased bullying and increased social dysfunction, antisocial behaviours, and reduced prosociality (Dantchev & Wolke, 2019; Schwartz & Proctor, 2000; Toseeb et al., 2020a). Such detrimental social outcomes, in turn, increase mental health difficulties (Tucker et al., 2014b; Wolke & Skew, 2012). The current findings add to this existing literature by suggesting that the indirect link between sibling bullying and mental health through detrimental social outcomes is likely to vary across families from distant cultures. More research is now needed to shed light on the reasons for cross-cultural variability in the role of detrimental social outcomes between sibling bullying and mental health.

Pre-existing research suggests clear links between sibling bullying and reduced self-esteem and between reduced self-esteem and poor mental health and wellbeing (Plamondon et al., 2021; Sharpe et al., 2021; Toseeb et al., 2020b; Toseeb & Wolke, 2022; van der Crujisen & Boyer, 2021). However, no previous studies have ever tested the mediating role of self-esteem in this association. Taken from there, the current thesis<sup>8</sup> confirmed that sibling bullying is an indirect risk factor for mental health and wellbeing through self-esteem in

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<sup>8</sup> Note: The role of self-esteem between sibling bullying and mental health and wellbeing could not be tested in Turkish families due to using existing data i.e., Millennium Cohort Study.

British autistic adolescents. There is some closely supporting evidence in the peer bullying literature; self-esteem has been reported as a significant mediator in the associations between peer bullying and mental health (Yang et al., 2022; Zhong et al., 2021). However, there are also contradicting arguments in the literature suggesting that bullying a socially vulnerable peer boosts the self-esteem levels of bullies (Pollastri, 2010; Slee & Rigby, 1993). Hence, the current research provides initial insights into the potential mediating role of self-esteem in between sibling bullying and mental health and that more research is needed to support these findings and to test whether this is the case in Turkish autistic adolescents.

Finally, it is important to note that causality must not be drawn on all reported indirect associations, in the current thesis, due to the cross-sectional nature of some tested parameters. This is mainly because there is a possibility for reverse causality or bidirectionality in cross-sectionally reported parameters. For instance, the role of emotion regulation in between sibling bullying and mental health, in the British sample, could be speculated otherwise. More specifically, as reported previously, the link between sibling bullying and emotion regulation is likely bidirectional (Kramer, 2014). That said, it is not yet clear whether emotion dysregulation drives sibling bullying or vice versa. Similar arguments may as well be made for the role of detrimental social behaviours as reduced social functioning may as well lead to increased risks for sibling bullying (Toseeb et al., 2020b). However, it is, perhaps, meaningful to argue for a causal mediator role of self-esteem in between sibling bullying and mental health in British autistic adolescents as this association was tested in a longitudinal mediation model which allows for causal inferences (Hayes, 2009).

#### ***8.2.5 Covid-19 May Led To Inconsistent Rates of Sibling Bullying Across Cultures***

Although it is not within the scope of this thesis to explore the reasons for the cross-cultural differences identified between British and Turkish families, some of the current findings may guide future researchers as to where to find potential underlying causes of

particular cross-cultural differences. For instance, Study II indicated slightly higher rates of sibling bullying in British than Turkish families. The reasons for this have remained unclear. However, looking at the findings from Study IV, one might argue that higher levels and stringency of Covid-19 measures in place in British culture, than in Turkish culture, may have boosted the instances of sibling bullying in British families beyond the rates in Turkish families. More specifically, British autistic adolescents spent a significantly higher amount of time together with their siblings and had lower parental supervision than their Turkish peers which may have further boosted sibling bullying instances in this culture (Toseeb, 2022; Tucker et al., 2014; Wolke et al., 2015). However, it is important to note that these are only speculations over the limited findings in the current thesis and, therefore, may not reflect the actual reasons underlying such cross-cultural variations in the prevalence rates of sibling bullying. Future researchers are advised to investigate whether differences in the contingency of Covid-19 measures together with time siblings spent together and parental supervision lead to cross-cultural variations in the prevalence of sibling bullying.

#### ***8.2.6 Parental Responses to Sibling Bullying Seem to Be Consistent Across Cultures***

The current thesis identified more similarities than differences in parental responses to sibling bullying across British and Turkish families. More specifically, in both cultures, three common parental responses to sibling bullying were found: *direct*, *indirect*, and *no intervention*. Not only is this finding consistent across British and Turkish families, but it also aligns well with the existing findings from other cultures. For instance, an investigation of European-American families suggested that these families also apply three different common reactions to sibling conflict, namely *passive active no intervention/non-involvement*, *direct intervention/intervene*, and *indirect intervention/coach*, which closely resembles the current findings (Kramer et al., 1999; McHale et al., 2000). Furthermore, a study of French-Canadian families (Bouchard et al., 2019) has also indicated three common parental intervention styles

to sibling conflict namely parental *non-involvement* (i.e., uninvolved), *coaching* (i.e., indirect), and *parental control* (i.e., direct) which also closely aligns with what the current thesis reports. Thus, the present cross-cultural findings, together with pre-existing evidence from single-culture studies, point to cross-cultural consistency in parental response styles to sibling conflict and bullying.

### **8.3 Strengths**

The current thesis holds several strengths in terms of its originality, methodological quality, and reporting of findings. In terms of its originality, to the best of my knowledge, the current thesis has been the first to investigate certain unexplored dynamics of sibling bullying. For example, the current thesis outlines the first study reporting the prevalence of sibling bullying in Turkish adolescents, i.e., the general population, while also validating the Sibling Bullying Questionnaire (SBQ) in this new population (Study I). Additionally, the current thesis has been the first to investigate cross-cultural variations in the prevalence, precursors, and outcomes of sibling bullying in families of autistic adolescents (Study II). Moreover, this thesis has been the first to unlock the indirect pathways between sibling bullying and mental health and wellbeing in autistic adolescents (Study II and Study III). Furthermore, the current thesis has been the first to suggest that sibling bullying is linked to increased detrimental social behaviours and reduced emotion regulation and self-esteem in British autistic adolescents. Finally, the current thesis, for the first time, has suggested that measuring cumulative risk exposure may be meaningful when reporting precursors of sibling bullying, instead of a limited focus on individual risk factors that are likely to confound one another (Study II).

In terms of its methodological strengths, first, the sample of Study III comes from a UK-based, nationally representative birth cohort study (i.e., Millennium Cohort Study) which improves the generalisability of the reported findings. Second, the use of standardised scales,

i.e., reliable and valid, in measuring the interest variables throughout the thesis, i.e., Study I-II-III, significantly improves the reliability and consistency of findings within- and between-cultures. On this, the translation and validation of the Sibling Bullying Questionnaire in the Turkish culture have further improved the consistency in conceptualisation and reporting of sibling bullying across two distant cultures. Third, the focus on both parent report (Study II) and child self-report (Study I & Study III) has potentially improved the sensitivity of the reported findings as it is not yet clear whether autistic adolescents or their parents are better reporters of autistic adolescents' sibling bullying experiences and subsequent mental health outcomes than another<sup>9</sup>.

Finally, in terms of its strengths in reporting findings, the use of advanced statistical techniques<sup>10</sup> to handle missing data improved the power of analysis and reduced the likelihood of biased estimates in the current thesis. Additionally, the use of structural equation modelling (SEM), instead of simple regressions, provided several advantages in terms of the simultaneous test of multiple associations, the test of complex model structures, and the evaluation of model fits and measurement errors. The SEM also allowed for confirming the factor structure of the newly translated SBQ. Finally, the use of SEM was also advantageous in building latent structures of the mental health outcomes (i.e., internalising

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<sup>9</sup> On the one hand, parents may not be aware of or witness sibling bullying between their autistic and non-autistic children due to the fact that it often happens behind closed doors, thus, underreport their bullying experiences (Dantchev, & Zemp, 2022). On the other hand, common pre-existing mental health difficulties of autistic adolescents may lead them to over-perceive and over-report their sibling bullying experiences than their actual levels (Bowes et al., 2014). Notwithstanding, autistic individuals may also misinterpret their bullying involvement as non-bullying, thus, underreport their bullying experiences (Van Roekel et al., 2010). Similarly, while parents may be better at reporting their child's externalising problems, adolescents may be better at reporting their internalising problems (Van der Meer, et al., 2008).

<sup>10</sup> For example, multiple imputations by chained equations, Full Information Maximum Likelihood.

and externalising problems) of autistic adolescents, where enough power was in place (i.e., Study II).

#### **8.4. Limitations**

The current thesis also holds several limitations which could be categorised under four sections: 1) sex/gender representation, 2) sensitivity of measures, 3) potential confounding impact, 4) test of causal models using cross-sectional data (Study II), and 5) limited scope. Hence, all findings reported in the current thesis should be interpreted within the scope of these limitations.

In terms of sex/gender representation, the samples of three studies (Study I, II, and III) in the current thesis have been predominantly male/boys, more than 70%, which extensively limits the representation of females/girls. Although males are 4 times more likely to be diagnosed with autism than females, the ongoing arguments suggest that this may be due to the masking and camouflaging tendency in females (Gould, 2017; Sedgewick et al., 2021). In this case, females/girls may likely be underrepresented in the current thesis. Additionally, Study II and Study IV, in the current thesis, are based on parent-report data which comprised mostly (90%) mothers. That is, fathers' views were underrepresented in these two studies.

In regard to the potential confounding impact, given the observational nature of the data and non-random recruitment of samples in the current thesis, it is likely that the reported findings suffer from potential unmeasured confounding impacts. For example, the current thesis did not control for the other type of bullying experiences such as peer bullying which is likely to confound the correlations between sibling bullying and its subsequent outcomes (i.e., social and emotional dysfunction and mental health and wellbeing). Additionally, given that sibling bullying is linked to various individual and family characteristics, there may be many other individual- and family-level factors, e.g., pre-existing mental health difficulties,

parent-child relationships, interparental conflict, that could not be controlled in the current thesis but hold the potential to confound the associations between reported risk factors and sibling bullying.

Concerning the cross-sectional test of causal models, Study II, in the current thesis, reports indirect associations between sibling bullying and mental health through social and emotional dysfunction. In the existing literature (Hayes, 2009), such models are identified as mediation models and suggested to be indicators of causal associations. However, the cross-sectional reporting of indirect associations is, to some extent, problematic as the direction of the effect could not be inferred. Therefore, although a causal model has been tested in Study II, no causal inferences should be concluded based on these findings.

Finally, in terms of its limited scope, first, following the double-empathy problem theory, Study II and Study III, in the current thesis, focus on families formed by autistic and non-autistic siblings. Additionally, since little to no information is available regarding the characteristics of siblings of the cohort members in the Millennium Cohort Study, i.e., Study III sample, the sibling compositions in this sample, e.g., autistic-autistic, autistic-non-autistic, could not be known. Due to this limitation, it is not possible to suggest whether findings from the current thesis inform in regard to the dynamics of sibling bullying in otherwise formed families (e.g., autistic-autistic). Second, the current thesis exclusively focuses on the outcomes of autistic siblings, therefore, it does not inform regarding the impacts of sibling bullying on the developmental outcomes of non-autistic siblings. This is problematic as sibling bullying experiences are likely to cause similar or even worse detrimental outcomes for non-autistic siblings too. Finally, although the current thesis reports the dynamics of sibling bullying in a cross-cultural context, the reported findings are limited to a single Western (UK) and non-Western (Turkey) culture and, thus, should not be generalised to all Western and non-Western cultures.



## 8.5 Practical Implications

Findings from individual studies, in the current thesis, lead to several practical implications which can be categorised under two main themes, namely preventing sibling bullying and minimising its potentially deteriorating effects on mental health and wellbeing. Practical implications for preventing sibling bullying include the following: 1) parental response to sibling bullying, 2) eliminating or controlling risk factors of sibling bullying, 3) practical suggestions for autistic and non-autistic siblings, and 4) suggestions for how to design effective sibling bullying intervention programmes. Alternative strategies to buffer the negative impact of sibling bullying, where prevention seems not feasible or possible, include promoting the social and emotional functioning and mental health of autistic adolescents.

In terms of effective parental response to sibling bullying, although the current thesis does not report what type of parental response to sibling bullying is more effective than others, it has explored how British and Turkish parents<sup>11</sup> intervene in sibling bullying. Although an overwhelming majority of parents said they would directly or indirectly intervene in sibling bullying when witnessed, a few mentioned that they would take no actions to intervene in the situation. Some of these parents, mainly British, said this is due to their uncertainty regarding how to respond to sibling bullying. Not intervening in sibling bullying is problematic as parental non-intervention in sibling bullying increases subsequent sibling bullying experiences. Additionally, some instances of harsh parenting<sup>12</sup> were observed, especially in Turkish families which is also a risk factor for sibling bullying. As a practical implication, seeking professional advice in terms of how to handle sibling bullying, instead of not intervening or showing harsh parenting may be effective in reducing the risk of subsequent sibling bullying in such families.

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<sup>11</sup> This is mostly mothers (i.e., more than 80%).

<sup>12</sup> i.e., using punishments, disciplining the bully or the non-autistic child only.

In terms of eliminating or controlling some risk factors of sibling bullying, the current findings indicate that certain, but not all, risk factors of sibling bullying could be eliminated which may further prevent or ease instances of sibling bullying. For instance, in the light of findings from Study III, providing autistic and non-autistic siblings with their own bedroom is likely to reduce the instances of sibling bullying as sharing a bedroom was found to increase the risk of sibling bullying. Additionally, although certain risk factors can not be prevented (e.g., siblings' gender composition, the severity of autistic traits, physical power imbalance between siblings), increased parental attention and supervision where such risk factors are in place may buffer the risk of sibling bullying. Moreover, in families formed by autistic and non-autistic sibling pairs, both siblings may fail to take the other's point of view (i.e., the double empathy problem) which increases the risks of sibling bullying. That said, for parents in such families, promoting empathy between two siblings may be an effective strategy to minimise the likelihood of future sibling bullying instances.

To the best of my knowledge, no past studies have ever presented any practical implications for siblings in terms of how they can minimise or prevent being victimised by their sibling or bullying a sibling at home. In terms of sibling victimisation, the findings of the current thesis suggest that not disclosing sibling bullying experiences to parents may reinforce the bullies' actions and increase the likelihood of subsequent sibling bullying. To minimise this, both autistic and non-autistic adolescents are advised to speak to their parents about their sibling bullying experiences so that their parents can take preventive measures. Though, in some cases, parents may normalise such instances and see them as part of daily sibling interaction, and therefore, choose not to intervene. In such cases, children may choose to disclose their sibling bullying experiences to others, such as another sibling, teacher, or another relative (e.g., grandmother), which may further discourage the bully from taking such actions. Additionally, for non-autistic siblings, it is important to be aware of their autistic

siblings' social, behavioural, and emotional difficulties and acknowledge that their siblings may not be aware of their bullying actions. Talking to their autistic siblings about how they feel when their autistic siblings show bullying behaviours may help the autistic sibling realise the harmful effects of their behaviours which may reduce their bullying actions.

Findings from the current thesis provide important practical implications for designing effective sibling bullying prevention programmes with a particular focus on eliminating individual- and family-level risk factors of sibling bullying. In terms of targeting individual-level risk factors, given that certain behavioural and emotional characteristics of autistic adolescents are likely to serve as risk factors for increased sibling bullying, such as highly aggressive and coercive behaviours, interventions targeting such developmental areas of autistic siblings may be effective in reducing subsequent instances of sibling bullying. In terms of family-level risk factors, since parenting practices, i.e., harsh parenting, parental differential treatment and favouritism, and parental non-intervention to sibling bullying are risk factors for subsequent sibling bullying, practitioners may choose to focus on such parenting practices to prevent future sibling bullying instances. Moreover, the cross-cultural findings from the current thesis (Study II) highlight the need for intervention programmes tailored to the cultural dynamics, as individual- and family-level precursors of sibling bullying vary across cultures. Thus, professionals and practitioners are strongly advised to focus on culture-specific needs to design effective intervention programmes. Finally, given that individuals who are involved in sibling bullying are likely to experience peer bullying, school policies and intervention programmes targeting peer bullying could be broadened to also target bullying experiences at home which would likely reduce both sibling and peer bullying instances altogether.

There are also some practical implications for parents and professionals to minimise the deteriorating impacts of sibling bullying on the mental health and wellbeing of autistic

adolescents, where prevention of sibling bullying seems not possible for various reasons. In some cases, preventing sibling bullying may not be entirely feasible due to several reasons, for example, sibling bullying often happens behind closed doors, autistic children may not be aware of their bullying involvement, either as the bully or the victim, and some autistic children (e.g., non-verbal) may not be able to disclose such experiences to their parents. In these cases, parents and professionals may choose to focus on minimising the deteriorating impacts of sibling bullying on the developmental outcomes of autistic adolescents.

Minimising the detrimental effects of sibling bullying on autistic adolescents is also likely to result in reduced rates of subsequent sibling bullying. More specifically, findings from the current thesis have shown indirect links between sibling bullying and mental health and wellbeing through social<sup>13</sup> and emotional functioning<sup>14</sup> in autistic adolescents. These findings are important as they imply that promoting the social and emotional functioning of autistic adolescents is likely to buffer the detrimental impacts of sibling bullying on their mental health and wellbeing. Additionally, given that pre-existing mental health difficulties increase the risk for subsequent sibling bullying involvement (Katsantonis, 2022), protecting the mental health and wellbeing of autistic adolescents from the deteriorating impacts of sibling bullying is also likely to serve as a protective factor for subsequent sibling bullying involvement.

## **8.6 Directions for Future Research**

The current thesis provides several important directions for future researchers which are conceptualised around four main themes: 1) reliable and consistent conceptualisation and measurement of sibling bullying, 2) testing of direct and indirect precursors and outcomes of sibling bullying, 3) controlling for potential confounding effects, 4) expanding cross-cultural

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<sup>13</sup> i.e., detrimental social behaviours.

<sup>14</sup> i.e., emotion regulation and self-esteem.

understanding of the dynamics of sibling bullying, 5) exploring broader precursors and outcomes of sibling bullying in autistic adolescents, and 6) other suggestions.

First, the literature keeps growing on inconsistent findings due to a lack of common practice in reporting the dynamics of sibling bullying (Brett et al., 2023). To overcome this, the current thesis suggests future researchers stick to the definition of sibling bullying conceptualised by Wolke and colleagues (2015) as it is the most comprehensive definition of sibling bullying adapted from the general bullying literature. Additionally, this thesis suggests future researchers use standardised scales in measuring sibling bullying.

Second, it is not yet clear whether adolescents or their parents are better reporters of adolescents' sibling bullying experiences, especially when a child is autistic. Given that autistic adolescents may not be fully aware of their sibling bullying experiences, both victimisation and perpetration, as they may not be able to conceptualise such instances as bullying, they may under-report their bullying experiences. Additionally, social communication difficulties of autistic children, i.e., being non-verbal, may further limit their abilities to report their sibling bullying experiences. Notwithstanding, pre-existing mental health difficulties, which are more common in autistic than non-autistic children, may lead them to over-perceive and over-report their bullying experiences (Bowes et al., 2014). Therefore, to control for such potential reporting bias, similar to Dantchev and Zemp's (2022) suggestion, the current thesis directs future researchers to integrate child-, sibling-, and parent reports for the most accurate measurement of sibling bullying. Finally, a focus on cross-cultural variations in cross-informant agreement in bullying is needed to understand parental awareness of sibling bullying across cultures.

Third, findings from the current thesis have shown, for the first time, that sibling bullying is indirectly correlated with mental health and wellbeing through third factors<sup>15</sup> in

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<sup>15</sup> i.e., detrimental social behaviours, emotion regulation, self-esteem.

autistic adolescents. Unlocking the potential indirect paths between sibling bullying and mental health and wellbeing is highly important for two reasons. First, in cases where the prevention of sibling bullying seems not feasible (e.g., child's non-disclosure, parental normalisation, etc.), promoting the factors that play a role in the relationship between sibling bullying and mental health and wellbeing may protect such developmental outcomes from the deteriorating impacts of sibling bullying. Second, it is evident that pre-existing mental health difficulties increase the risk of subsequent sibling bullying (Dantchev & Wolke, 2019; Katsantonis, 2022). That said, protecting the mental health and wellbeing of individuals by promoting such factors in between sibling bullying and mental health is likely to result in a reduced likelihood of subsequent sibling bullying in the future. Therefore, the current thesis strongly encourages future researchers to unlock other potential indirect paths between sibling bullying and mental health and wellbeing to be able to minimise the detrimental impacts of sibling bullying and its future prevention.

Fourth, just like the indirect correlation between sibling bullying and its developmental outcomes, it may as well be indirectly predicted by its precursors. For instance, although the current findings have suggested that lower autistic traits and being late-diagnosed with autism are precursors of sibling bullying, these risk factors are likely to have indirect links with sibling bullying, e.g., increased social sibling interactions. Similarly, being a male and having a male sibling are suggested to increase the risk of sibling bullying, though it is not sensible to suggest that individuals' sex predicts such instances. It is most likely the case that being a male or having a male sibling leads to other third factors which, in turn, result in sibling bullying. For instance, previous researchers indicated that males are less likely to disclose their sibling bullying to their parents than females (Hunter et al., 2004), which is likely to result in parental non-awareness and non-intervention which is a risk factor for increased sibling bullying (Bouchard et al., 2019). Similarly, bystanders of male bullying

are less likely to intervene than bystanders of female bullying (Cowie, 2000), which may be one triggering reason for increased sibling bullying amongst males. Hence, although it appears that some precursors of sibling bullying may be indirect risk factors, instead of direct risk factors, to the best of my knowledge, no previous studies, including the current thesis, have ever tested this yet. Therefore, future researchers are urged to test the potential indirect links between sibling bullying and its precursors, preferably in longitudinal research designs to draw causality.

Fifth, given the non-randomised, observational nature of all previous studies on sibling bullying, including the findings of the current thesis, there is a great possibility that some of the reported parameters, precursors and outcomes, are confounded by other potential correlates of sibling bullying. For instance, in the current thesis, parameter estimates between sibling bullying and developmental outcomes<sup>16</sup> are not controlled for peer bullying which is highly prevalent and associated with both sibling bullying and its subsequent outcomes, and thus, holds the potential to confound its parameter estimates. Additionally, the limited testing of precursors of sibling bullying, in both previous research and the current thesis, raises concerns over potential false-positive results as such precursors may turn out to be not significant upon testing with all other potential precursors of sibling bullying. To minimise the confounding bias, future researchers are advised to replicate past and current findings on sibling bullying by controlling for potential confounding factors, either through testing of all potential confounders or the use of advanced statistical analysis techniques, such as propensity score matching.

Sixth, to the best of my knowledge, the current thesis has been the first cross-cultural investigation of sibling bullying. Although this provides great advantages for cross-cultural understanding of the dynamics of sibling bullying, i.e., prevalence, risk factors, and

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<sup>16</sup> i.e., social skills, detrimental social behaviours, emotion regulation, self-esteem, mental health, wellbeing.

outcomes, findings are limited to British and Turkish families only. Given that findings of the current thesis indicated that prevalence, precursors, and outcomes of sibling bullying vary across a Western and a non-Western culture, a wider cross-cultural investigation of this phenomenon strikes more important than ever as past research in the literature has mainly built on findings from Western-cultures. To overcome this, future researchers are advised to conduct a multi-country study of sibling bullying where they test for cross-cultural variations in the prevalence, culture-specific risk factors, and outcomes of sibling bullying.

Seventh, past research, including the current thesis, has focused on the implications of sibling bullying on one sibling's developmental outcomes while broader outcomes of sibling bullying have commonly remained unexplored. For instance, previous research, including the current thesis, has commonly reported the implications of sibling bullying on the target sibling's (e.g., the autistic child (Study II), the cohort member (Study III)) developmental outcomes due to feasibility reasons while outcomes of siblings have largely remained unknown. Additionally, previous research has focused on the impacts of parents (e.g., parenting characteristics) on sibling bullying while, to the best of my knowledge, no research has reported potentially detrimental impacts of sibling bullying on parental outcomes (e.g., parental distress). Moreover, sibling bullying is also likely to influence broader developmental outcomes of target siblings, such as academic outcomes, intimate relationships, life and career goals and so on, which have so far remained unexplored. Based on this, the current thesis advises future researchers to take a broader focus on the implications of sibling bullying on wider outcomes for both siblings as well as parents.

There are also some final suggestions. To begin with, Study III has shown that late-diagnosed autistic adolescents are at a greater risk for sibling bullying than those who were early-diagnosed. Given that females are more likely to be missed on or late-diagnosed with autism than males, late-diagnosed female autistic adolescents may be more prone to sibling



bullying than male autistic adolescents. Though this could not be tested in the current thesis due to sample power restrictions, therefore, future researchers are invited to look into this matter. Furthermore, the current thesis reports the dynamics of sibling bullying in families where a child is autistic which provides insights to otherwise formed families. Therefore, future research is advised to explore sibling bullying in families formed by autistic – autistic siblings in a cross-cultural context. Finally, current findings provide initial insights into the indirect links between sibling bullying and mental health with no substantial supporting evidence in the literature, thus, more research is needed to replicate these findings.

### **8.7 General Conclusions**

Sibling bullying is highly prevalent in the lives of British and Turkish autistic adolescents and leads to detrimental mental health outcomes. Therefore, it should not be regarded as a normative part of daily sibling interactions. The inconsistency in the measurement practices of sibling bullying potentially degrades the scale of the problem as the reported prevalence rates do not align from one to another research. Improved practices around a standard conceptualisation and measurement of sibling bullying are urgently needed to reveal the scale of the problem. After many decades of failure in preventing sibling bullying instances, the current findings bring new hopes in terms of alternative preventative measures such as manipulating factors that link sibling bullying to mental health. Given that our society has invested a lot of resources in preventing mental health difficulties at early ages, directing such funding sources into research on sibling bullying, a threat to the mental health of children and adolescents, would likely contribute to such goals in our society. Finally, increased parental attention and supervision are needed at times when children are forced to spend an excessive amount of time together, e.g., lockdown, or social isolation, as such measures further trigger sibling bullying instances at home.

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## Appendices

### Appendix I: Study-I Supplementary Materials

**Table S1**

*The Turkish Sibling Bullying Questionnaire (T-SBQ)*

	Hiç	Sadece 1 veya 2 kez	Ayda 2 veya 3 kez	Yaklaşık haftada bir kez	Haftada birkaç kez
<b>Son 6 ay içerisinde ne sıklıkla herhangi bir kardeşin aşağıda sıralananları sana karşı yaptı?</b>					
1- Sana vurdu, seni tekmeledi veya itti, veya bunları yapmakla seni tehdit etti.	1	2	3	4	5
2- Sana ait eşyaları veya parayı izinsiz aldı veya eşyalarına zarar verdi.	1	2	3	4	5
3- Sana hakaret ve nefret içeren kelimelerle hitap etti.	1	2	3	4	5
4- Senin ile alay etti.	1	2	3	4	5
5- Seni bilerek görmezden geldi veya arkadaş grubundan dışladı.	1	2	3	4	5
6- Senin hakkında yalan söyledi, söylentiler yaydı veya başkalarının senden nefret etmesi için çalıştı.	1	2	3	4	5
7- Başka bir şekilde sana zorbalık yaptı.	1	2	3	4	5
<b>Son 6 ay içerisinde sen ne sıklıkla aşağıda sıralananları herhangi bir kardeşine yaptın?</b>					
8- Kardeşine vurdun, onu tekmeledin veya ittin, veya bunları yapmakla onu tehdit ettin.	1	2	3	4	5
9- Kardeşine ait eşyaları veya parayı izinsiz aldın veya eşyalarına zarar verdin.	1	2	3	4	5
10- Kardeşine hakaret ve nefret içeren kelimelerle hitap ettin.	1	2	3	4	5
11- Kardeşin ile alay ettin.	1	2	3	4	5
12- Kardeşini bilerek görmezden geldin veya arkadaş grubundan dışladın.	1	2	3	4	5
13- Kardeşin hakkında yalan söyledin, söylentiler yaydın veya başkalarının ondan nefret etmesi için çalıştın.	1	2	3	4	5
14- Başka bir şekilde kardeşine zorbalık yaptın.	1	2	3	4	5

**Table S2***Collinearity metrics for multiple regression models*

	<b>VIF</b>	<b>Tolerance</b>
<b>T-SBQ items</b>		
I was hit, kicked, pushed, or shoved around or they threatened to do this.	2.37	.42
I had things damaged or taken from me, including money.	1.86	.53
I was called nasty and hateful names.	2.56	.39
I was made fun of.	2.37	.42
They kept me out of things on purpose, leaving me out of their group of friends.	1.68	.59
They told lies or spread rumours about me or tried to make others dislike me.	2.02	.49
I was bullied in another way.	1.97	.50
I hit, kicked, pushed, or shoved a brother or sister around, or threatened to do.	2.71	.36
I took money or other things from a brother or sister or damaged their belonging.	1.61	.62
I called a brother or sister nasty and hateful names.	2.97	.33
I made fun of a brother or sister in other ways.	2.55	.39
I kept a brother or sister out of things on purpose, leaving them out of my group of friends.	1.79	.55
I spread rumours about a brother or sister or tried to make others dislike them.	2.29	.43
I bullied in another way.	1.86	.53
	<b>Mean 2.19</b>	<b>.47</b>

*Note.* The VIF and tolerance values were calculated by using the complete case dataset with no imputations.



**Table S3***Missing data and imputed values*

Variables	Complete (N)	Imputed (N)	Imputed (%)	Total (N)
<b>Parent's characteristics</b>				
Parent's sex	297	4	1	301
<b>Child Characteristics</b>				
Child's sex	238	63	21	301
Child's age	301	0	0	301
Child's birth order	299	2	1	301
Child's number of siblings	287	14		301
Child's type of school	301	0	0	301
Child's school grade	301	0	0	301
<b>T-SBQ items</b>				
I was hit, kicked, pushed, or shoved around or they threatened to do this.	299	2	1	301
I had things damaged or taken from me, including money.	294	7	2	301
I was called nasty and hateful names.	289	12	4	301
I was made fun of.	294	7	2	301
They kept me out of things on purpose, leaving me out of their group of friends	291	10	3	301
They told lies or spread rumours about me or tried to make others dislike me.	287	14	5	301
I was bullied in another way.	286	15	5	301
I hit, kicked, pushed, or shoved a brother or sister around, or threatened to do.	294	7	2	301
I took money or other things from a brother or sister or damaged their belonging.	297	4	1	301
I called a brother or sister nasty and hateful names.	300	1	3	301
I made fun of a brother or sister in other ways.	300	1	1	301
I kept a brother or sister out of things on purpose, leaving them out of my group of friends.	294	7	2	301
I spread rumours about a brother or sister or tried to make others dislike them.	288	13	4	301
I bullied in another way.	287	14	5	301
Disclosure to parents	294	7	2	301
Disclosure to teacher	271	30	10	301
Disclosure to friends	269	32	11	301
Disclosure to others	248	53	18	301
<b>R-SBQ items</b>				
I called my sibling nasty names and made fun of him/her.	287	14	5	301
I kept my sibling out of our group and ignored him/her.	282	19	6	301
I beat my sibling and pushed him/her around.	280	21	7	301
I spread rumours about my sibling to make others dislike them.	280	21	7	301
I damaged my sibling's belongings.	278	23	8	301
I made fun of my sibling's physical appearance or speech.	278	23	8	301
I gave my sibling a hard time.	277	24	8	301
I made my sibling afraid of me and I liked it.	278	23	8	301
I showed my sibling that I am the boss.	278	23	8	301

**Table S4***The factor structure of the T-SBQ according to PCA results*

<b>Factor</b>	<b>Eigenvalue</b>	<b>Difference</b>	<b>Proportion</b>	<b>Cumulative</b>
Factor1	6.28	4.67	.44	.44
Factor2	1.60	.59	.11	.56
Factor3	1.01	.13	.07	.63
Factor4	.87	.10	.06	.69
Factor5	.77	.13	.05	.75
Factor6	.63	.10	.04	.80
Factor7	.53	.09	.03	.83
Factor8	.43	.03	.03	.86
Factor9	.40	.04	.02	.89
Factor10	.36	.05	.02	.92
Factor11	.31	.02	.02	.94
Factor12	.29	.04	.02	.96
Factor13	.24	.04	.01	.98
Factor14	.20	.	.01	1.00

*Note: LR test: independent vs. saturated:  $\chi^2(91) = 1856.12$  Prob> $\chi^2 = 0.0000$*

**Table S5**

*Inter-scale and between subscales correlation coefficients and floor and ceiling effects (N = 301)*

Scales / Subscales	1	2	3	4	Floor	Ceiling
1- Victimization (T-SBQ subscale)	1.00				20%*	1%*
2- Perpetration (T-SBQ subscale)	.76	1.00			22%**	0%**
3- The T-SBQ (T-SBQ test scale)	.95	.93	1.00		14%***	0%***
4- The R-SBQ (R-SBQ test scale)	.65	.84	.79	1.00	27%****	0%****

*Note.* \* refers to a complete case of 274 adolescents, \*\* refers to a complete case of 284 adolescents, \*\*\* refers to a complete case of 262 adolescents, \*\*\*\* refers to a complete case of 269 adolescents.

**Table S6***T-SBQ inter-item correlations*

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
1- Victim. Physical	1.00						
2- Victim. D. Property	.49	1.00					
3- Victim. Verbal1	.58	.49	1.00				
4- Victim. Verbal2	.56	.45	.66	1.00			
5- Victim. Relational1	<b>.27*</b>	.40	.42	.42	1.00		
6- Victim. Relational2	<b>.26*</b>	.43	.35	.34	.40	1.00	
7- Victim. Other	.40	.45	.42	.44	.49	.45	1.00
8- Perpet. Physical	.69	.44	.59	.58	.33	<b>.28*</b>	.35
9- Perpet. D.Property	.43	.51	.35	.33	<b>.27*</b>	<b>.27*</b>	<b>.23*</b>
10- Perpet. Verbal1	.52	.37	.65	.57	<b>.23*</b>	.30	.31
11- Perpet. Verbal2	.48	.32	.50	.60	<b>.28*</b>	<b>.25*</b>	.33
12- Perpet. Relational1	<b>.26*</b>	.30	<b>.28*</b>	<b>.29*</b>	.37	.44	<b>.25*</b>
13- Perpet. Relational2	<b>.21*</b>	.32	<b>.25*</b>	<b>.29*</b>	.40	.61	.37
14- Perpet. Other	.35	<b>.27*</b>	.38	.39	<b>.28*</b>	.32	.52
	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>
8- Perpet. Physical	1.00						
9- Perpet. D. Property	.45	1.00					
10- Perpet. Verbal1	.66	.44	1.00				
11- Perpet. Verbal2	.61	.39	.70	1.00			
12- Perpet. Relational1	.36	<b>.25*</b>	.35	.42	1.00		
13- Perpet. Relational2	<b>.25*</b>	.33	<b>.29*</b>	.34	.54	1.00	
14- Perpet. Other	.42	.34	.50	.50	.35	.44	1.00

Note: \* = < 0.3

**Table S7***Internal consistency of the T-SBQ (N = 301)*

	Obs	Min Max	Mean	Std. Dev.	Item Test Cor.	Item Rest Cor.	Average Interitem Cov.	alpha
I was hit, kicked, pushed, or shoved around or they threatened to do this.	301	1-5	2.5	.09	.69	.63	.39	.89
I had things damaged or taken from me, including money.	301	1-5	1.8	.07	.67	.61	.40	.89
I was called nasty and hateful names.	301	1-5	2.5	.08	.74	.69	.39	.89
I was made fun of.	301	1-5	2.5	.08	.73	.68	.39	.89
They kept me out of things on purpose, leaving me out of their group of friends or completely ignoring me.	301	1-5	1.6	.06	.60	.53	.40	.90
They told lies or spread rumours about me, or tried to make others dislike me.	301	1-5	1.3	.05	.61	.53	.40	.89
I was bullied in another way.	301	1-5	1.6	.06	.63	.56	.40	.89
I hit, kicked, pushed, or shoved a brother or sister around, or threatened to do this.	301	1-5	2.3	.08	.74	.69	.39	.89
I took money or other things from a brother or sister or damaged their belongings.	301	1-5	1.5	.05	.59	.51	.41	.90
I called a brother or sister nasty and hateful names.	301	1-5	2.2	.07	.73	.68	.39	.89
I made fun of a brother or sister in other ways.	301	1-5	2.1	.08	.71	.65	.39	.89
I kept a brother or sister out of things on purpose, leaving them out of my group or completely ignored them.	301	1-5	1.4	.05	.59	.51	.41	.90
I spread rumours about a brother or sister or tried to make others dislike them.	301	1-5	1.2	.03	.60	.52	.41	.90
I bullied in another way.	301	1-5	1.5	.05	.63	.56	.40	.89
<b>Test scale</b>							<b>.40</b>	<b>.90</b>

Note. Results from 10 imputed data sets were averaged to report internal consistency of the T-SBQ

**Table S8***Sibling bullying involvement and by birth order and number of siblings (N = 301)*

	Birth Order			Number of Siblings		
	Eldest (Boys~Girls)	Middle (Boys~Girls)	Youngest (Boys~Girls)	1	2	3+
	%	%	%	%	%	%
<b><u>Sibling bullying status</u></b>						
Uninvolved	36 (24 ~ 46)	50 (50 ~ 49)	63 (67 ~ 60)	41	50	55
Pure-Victims	20 (24 ~ 17)	22 (26 ~ 18)	12 (8 ~ 16)	19	19	16
Pure-Bullies	6 (6 ~ 6)	3 (3 ~ 2)	1 (2 ~ 0)	2	5	3
Bully-Victims	38 (45 ~ 31)	25 (20 ~ 31)	24 (22 ~ 24)	38	25	26
<b><u>Types of sibling bullying</u></b>						
Physical	48 (57 ~ 41)	35 (29 ~ 39)	24 (25 ~ 23)	47	35	27
Verbal	47 (54 ~ 42)	38 (32 ~ 42)	30 (31 ~ 30)	43	37	37
Relational	16 (25 ~ 9)	12 (6 ~ 16)	17 (15 ~ 18)	15	16	14
Other	16 (21 ~ 13)	12 (9 ~ 15)	11 (14 ~ 9)	17	13	10

**Figure S1**

*Translation and cross-cultural adaptation process of the T-SBQ*

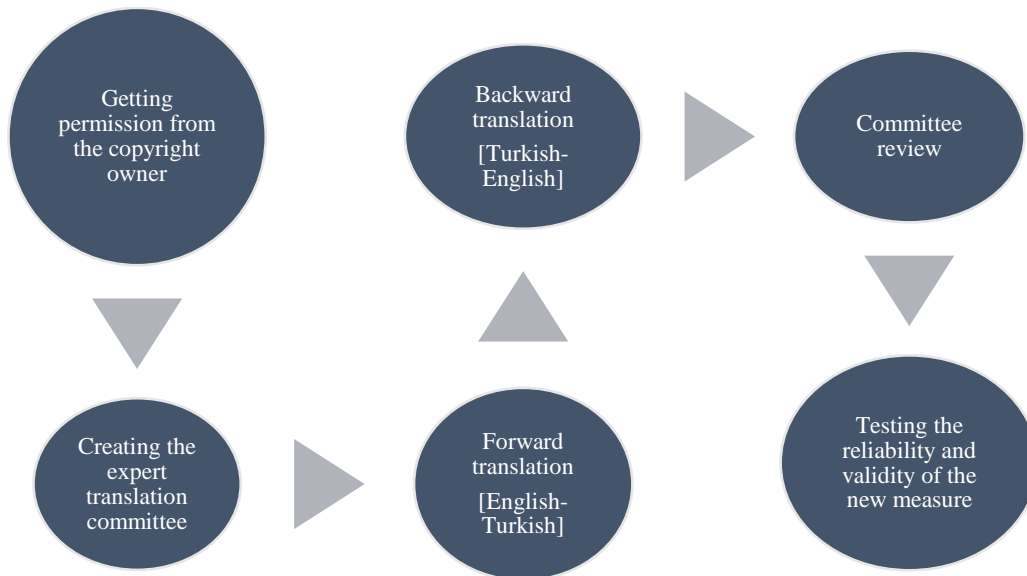
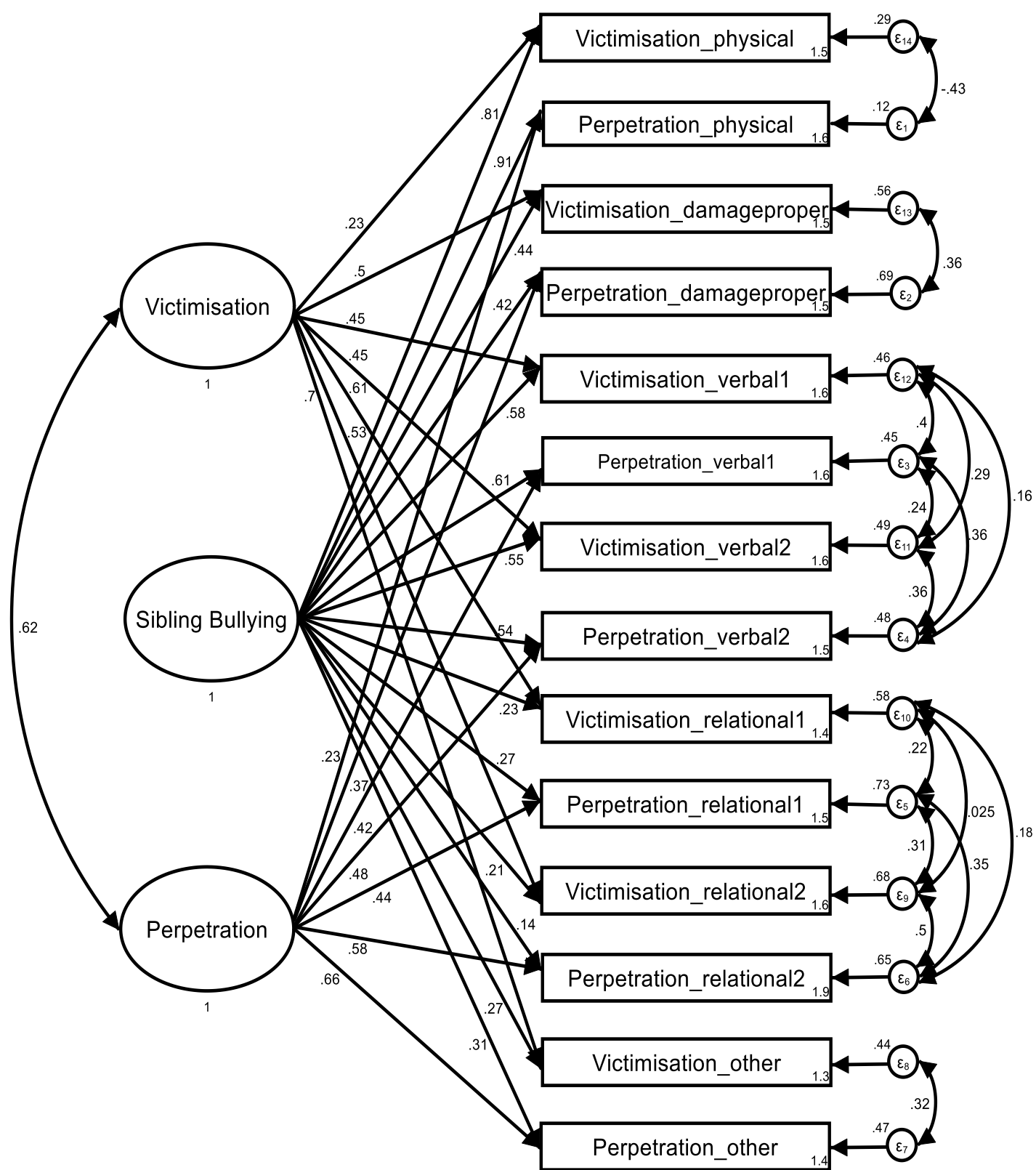


Figure S2

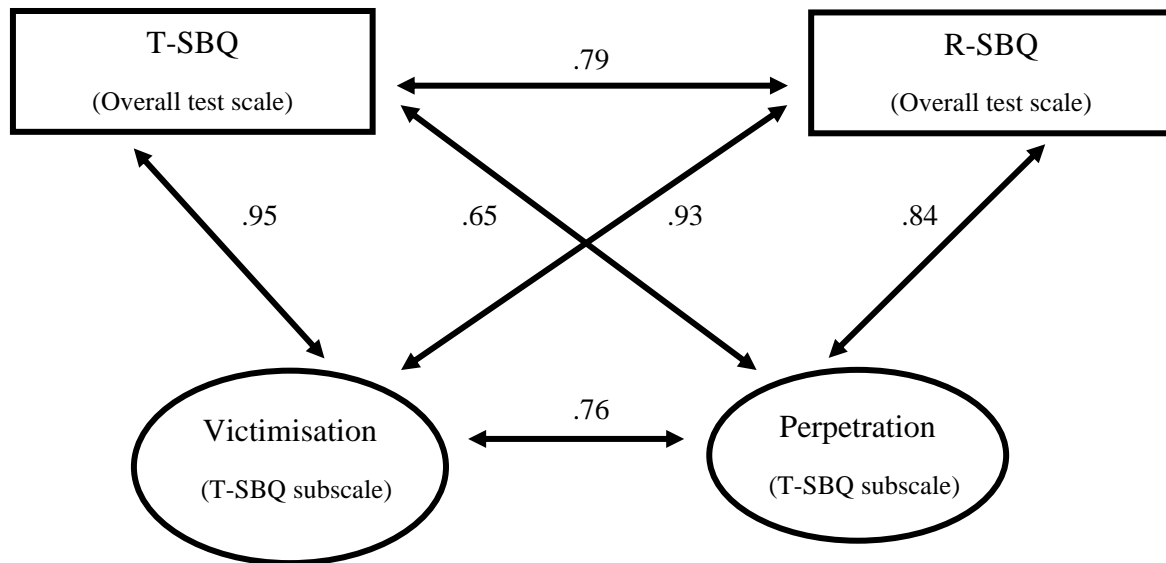
Model 2. A second-order correlated two-factor bifactor model





**Figure S3**

*Correlations between the T-SBQ and R-SBQ scales and subscales*



## Appendix II: Study-II Supplementary Materials

### Appendix A - Methods

#### Measures

##### Autistic Traits

The AQ-10 was used to assess the autistic characteristics of British and Turkish autistic adolescents. The AQ-10 was originally developed in English and later translated into Turkish and validated in a Turkish sample (Cetinoglu & Aras, 2022). In the current study, given the age range of the target autistic sample was between 9-20 years, the AQ-Child-10 was used to measure the autistic traits of those aged 9-11 years and the AQ-Adolescents-10 was used for those aged 12+ years. An overall autistic traits test scale was generated by summing the child and adolescent AQ scores. The autistic traits test scale showed good internal consistency in the British sample ( $\alpha=.72$ ) and acceptable in the Turkish sample ( $\alpha=.54$ ). The autistic traits variable was included as a potential confounder in the SEM models.

##### Sibling Bullying

The SBQ was used to evaluate the sibling bullying victimisation and perpetration experiences of autistic adolescents. The SBQ was originally developed in English (Dantchev et al., 2019a), adapted from the Olweus's (1993) bullying questionnaire, and was later translated into Turkish and validated in a Turkish sample of adolescents (Deniz et al., 2022).

In the present study, the SBQ showed good internal consistency reliability for both victimisation (UK  $\alpha =.90$ , TR  $\alpha =.80$ ) and perpetration (UK  $\alpha =.88$ , TR  $\alpha =.75$ ) subscales. Sibling victimisation and perpetration scales were used as continuous variables with higher scores indicating higher rates of sibling bullying involvement. Additionally, a well-accepted cut-off value, about once a week, was used to report descriptive statistics such as prevalence of sibling victimisation/perpetration and to construct sibling bullying groups: *Victim-only*: Those who were victimised at least once a week but perpetrated less than once a week, *Perpetrator-only*: Those who were victimised less than once a week but perpetrated at least once a week, *Victim-Perpetrator*: Those who were victimised by their neurotypical sibling and

perpetrated their sibling at least once a week (Dantchev & Wolke, 2019a; Toseeb et al., 2018; Wolke & Samara, 2014; Deniz et al., 2022).

### **Emotion Regulation**

The ERC was used to measure the emotion regulation skills of autistic adolescents. The ERC was originally developed in English (Shields & Cicchetti, 1997) and has been used extensively in measuring the emotion regulation skills of autistic children, adolescents, and adults (Berkovits et al., 2017; Burton et al., 2020; Cai et al., 2018; Sáez-Suanes et al., 2020; Tajik-Parvinchi et al., 2020; Thomson et al., 2015). The ERC was later translated into Turkish and validated in a Turkish sample of children (Kapci et al., 2009) and has been widely used to measure the emotion regulation skills of neurotypical and neurodiverse Turkish children and adolescents aged 0-17 years old (Acar et al., 2021; Batum & Yagmurlu, 2007; Elikucuk & Ozyurt, 2018; Ozyurt et al., 2017a; Ozyurt et al., 2017b; Ozyurt et al., 2018; Pala et al., 2022). In this study, the emotion regulation subscale of the ERC showed acceptable internal consistency reliability in both British ( $\alpha=.64$ ) and Turkish ( $\alpha=.70$ ) samples.

### **Social Skills**

The ASSP was used to measure social functioning and detrimental social behaviours of autistic adolescents. The ASSP was originally developed in English (Bellini & Hopf, 2007) and was later translated into Turkish and validated in a Turkish sample of children and adolescents (Demir, 2014). The social participation and social reciprocity subscales of the ASSP were combined to generate the social functioning test scale and detrimental social behaviours total score was used as indication of detrimental social behaviours. Both test scales were further modified according to item-test loadings. In the social functioning test scale, three items were dropped due to showing a weak item-test correlation ( $<.20$ ) in either British or Turkish sample. Upon modifications, the social functioning test scale showed excellent internal consistency in the British ( $\alpha=.93$ ) and Turkish ( $\alpha=.96$ ) samples. Similarly, in the detrimental social behaviours test scale, two items were removed due to showing a weak

item-test correlation ( $<.20$ ) in either sample which provided good internal consistency and reliability in the British ( $\alpha=.79$ ) and Turkish ( $\alpha=.76$ ) samples.

### **Mental Health**

The SDQ was used to measure the mental health of autistic adolescents. The original form of the SDQ was developed in English (Goodman, 1997) which was then translated into Turkish and validated in a sample of Turkish adolescents (Güvenir et al., 2008). Both internalising problems (UK=.60, TR=.71) and externalising problems (UK=.68, TR=.68) test scales showed acceptable internal consistency reliability in both samples.

### **Data Analyses**

All statistical analyses were conducted using STATA/ MP 17. All variables in the SEM were manifest variables, instead of latent constructs. This was done to reduce model complexity and to improve model fit (Stephenson & Holbert, 2003). A recently developed MEDSEM package (Mehmetoglu, 2018) was used to report the indirect associations between sibling bullying and mental health difficulties. Monte Carlo simulation was used to replicate MEDSEM results on randomly generated samples ( $N=5000$ ) to correct parameter estimates due to non-normal distribution in interest variables (see Table S4). To indicate how well the data fit the pre-hypothesised models, the following goodness of fit indices of the SEMs were reported: the root mean square error of approximation (RMSEA), comparative fit index (CFI), Tucker–Lewis index (TLI), Standardized Root Mean Square Residual (SRMR), and the coefficient of determination (CD) were reported. The model fits were considered adequate where the CFI and TLI  $\geq .90$ , RMSEA and SRMR  $\leq .08$  (Browne & Cudeck, 1992; Hu & Bentler, 1999). Additionally, saturated models were also considered acceptable if the chi-square p-value was non-significant ( $>.05$ ).

### **Missing Data**

Data missingness was tested to see whether the prerequisites for using advanced techniques to handle missing data and maximise samples' power, missing at random (MAR), were met (Rubin, 2004). The MAR assumption indicates that missingness in the data is not

predicted by the observed values in variables of interest. In doing this, a binary variable was generated to indicate the presence of missing values in the data (0=No missing values, 1= One or more missing values). Logistic regression models were fitted, independently, to test whether the missingness in the data was predicted by the observed values in demographic (e.g., gender) or interest variables (e.g., sibling bullying, internalising and externalising problems). The results indicated that the data was MAR, thus, the prerequisites for data imputation were met (see Table S5).

Since the missing data were MAR, two advanced statistical techniques – multiple imputations by chained equations (MICE) and Full Information Maximum Likelihood (FIML) – were used to handle missing data. In fitting MICE, the predictive mean matching (PMM) method was used to generate 50 multiply imputed data sets, the number of imputed datasets ( $m$ ) was greater than the highest proportion of missingness (Van Buuren, 2018), to report descriptive statistics on full samples. Additionally, FIML was used to maximise samples' power in SEMs. The number of missing and imputed values in demographic and interest variables can be seen in Table S6 (Supplementary materials).

## Tables

Table S1

*Parents' Demographics*

	UK (N=289)		TR (N=171)	
	Freq	%	Freq	%
<b>Respondent</b>				
Mother	231	80	151	88
Father	58	20	20	12
<b>Ethnicity</b>				
White	267	.92	-	-
Non-White	22	.08	-	-
Turkic	-	-	150	88
Non-Turkic	-	-	21	12
<b>Education</b>				
College degree or above	144	50	38	22
Below college degrees	145	50	133	78
<b>Marital Status</b>				
Married (First, second, or later)	272	94	163	95
Not married (Single, divorced, etc)	17	6	8	5
<b>Living Area</b>				
England	262	91	-	-
Scotland	10	3.5	-	-
Wales	10	3.5	-	-
Northern Ireland	7	2	-	-
Marmara	-	-	64	37
Mediterranean	-	-	50	29
Aegean	-	-	23	13
Central Anatolia	-	-	18	10
Other	-	-	16	9

*Note.* Demographic information reported on multiply imputed date sets (m=50).

**Table S2***Demographic Information of Autistic Children by Country*

	UK (N=289)		TR (N=171)	
	Freq	%	Freq	%
<b>Gender (Autistic Child)</b>				
Boys	210	73	137	80
Girls	79	27	34	20
<b>Gender (Neurotypical Sibling)</b>				
Boys	147	51	95	56
Girls	142	49	76	44
<b>Birth order (Autistic Child)</b>				
First-born	153	53	86	50
Second or later born	136	47	85	50
<b>Birth order (Neurotypical Sibling)</b>				
First-born	98	34	69	40
Second or later born	191	66	102	60
<b>School Type (ASC)</b>				
Mainstream	120	42	75	44
Special school	151	52	79	46
Other	18	6	17	10

*Note.* Demographic information is reported on multiply imputed date sets (m=50).

**Table S3***Internal Consistency of the Scales by Country*

Scale	UK (N=289)			TR (N=171)		
	Obs.	Item Test Cor.	alpha	Obs.	Item Test Cor.	alpha
<b>Perpetration</b>						
1- Autistic child hit, kicked, pushed or shoved their NT sibling around or threatened to do this	288	.76	.86	161	.64	.72
2- Autistic child took or damaged their NT sibling's belongings, including money	288	.71	.87	160	.59	.74
3- Autistic child called their NT sibling nasty and hateful names	287	.79	.86	161	.73	.69
4- Autistic child made fun of their NT sibling	288	.78	.86	156	.71	.70
5- Autistic child kept their NT sibling out of things on purpose, left them out of their group of friends or completely ignored them	283	.78	.86	158	.51	.75
6- Autistic child told lies or spread rumours about their NT sibling, or tried to make others dislike them	282	.74	.87	158	.62	.73
7- Autistic child bullied their NT sibling in another way	285	.80	.86	159	.65	.72
<b>Test scale</b>			<b>.88</b>			<b>.75</b>
<b>Victimisation</b>						
1- NT child hit, kicked, pushed or shoved their autistic sibling around or threatened to do this	285	.78	.89	152	.72	.77
2- NT child took or damaged their autistic sibling's belongings, including money	285	.80	.88	149	.52	.78
3- NT child called their autistic sibling nasty and hateful names	284	.76	.89	144	.71	.77
4- NT child made fun of their autistic sibling	286	.79	.88	144	.74	.76
5- NT child kept their autistic sibling out of things on purpose, left them out of their group of friends or completely ignored them	283	.74	.89	146	.64	.78
6- NT child told lies or spread rumours about their autistic sibling, or tried to make others dislike them	283	.79	.88	143	.69	.77
7- NT child bullied their autistic sibling in another way	279	.87	.87	143	.64	.79
<b>Test scale</b>			<b>.90</b>			<b>.80</b>
<b>Emotion Regulation</b>						
1- Is a cheerful child	281	.66	.56	161	.68	.64
2- Responds positively to neutral or friendly approaches by adults.	280	.65	.56	157	.73	.62
3- Responds positively to neutral or friendly approaches by peers.	280	.64	.57	155	.70	.63
4- Can say when s/he is feeling sad, angry or mad, fearful or afraid.	281	.41	.64	157	.64	.65
5- Seems sad or listless.	281	.40	.64	153	.39	.72
6- Displays flat affect (expression is vacant and inexpressive; child seems emotionally absent)	279	.43	.64	157	.49	.69
7- Is empathic towards others; shows concern when others are upset or distressed.	280	.59	.58	156	.66	.64
8- Displays appropriate negative emotions (anger, fear, frustration, distress) in response to hostile, aggressive or intrusive acts by peers.	280	.45	.63	157	.28*	.73
<b>Test scale</b>			<b>.64</b>			<b>.70</b>
<b>SDQ-Internalising Problems</b>						
1- Often complains of headaches, stomach-aches, or sickness	277	.43	.58	151	.50	.69
2- Many worries, often seems worried	274	.52	.55	153	.69	.65
3- Often unhappy, down-hearted or tearful	276	.57	.54	153	.65	.67
4- Nervous or clingy in new situations, easily loses confidence	276	.50	.56	157	.67	.66
5- Many fears, easily scared	277	.56	.54	155	.63	.67
6- Rather solitary, tends to play alone	277	.33	.61	154	.50	.69
7- Has at least one good friend	277	.31	.61	151	.44	.71
8- Generally liked by other children	277	.46	.57	155	.50	.69
9- Picked on or bullied by other children	277	.50	.56	155	.44	.71
10- Gets on better with adults than with other children	277	.46	.57	151	.28	.73
<b>Test scale</b>			<b>.60</b>			<b>.71</b>
<b>SDQ-Externalising Problems</b>						
1- Often has temper tantrums or hot tempers	276	.61	.63	152	.63	.62
2- Generally obedient, usually does what adults request	277	.56	.65	151	.60	.63



3- Often fights with other children or bullies them	277	.46	.67	151	.38	.68
4- Often lies or cheats	277	.53	.65	151	.37	.69
5- Steals from home, school or elsewhere	276	.53	.65	147	.36	.68
6- Restless, overactive, cannot stay still for long	276	.63	.63	155	.57	.63
7- Constantly fidgeting or squirming	277	.50	.66	152	.59	.63
8- Easily distracted, concentration wanders	275	.56	.65	156	.60	.64
9- Thinks things out before acting	273	.33	.69	152	.50	.65
10- Sees tasks through to the end, good attention span	277	.36	.69	151	.51	.65
<b>Test scale</b>			<b>.68</b>			<b>.68</b>
<b>Anxiety<sup>1</sup></b>						
1- ITEM-1 not displayed due to the scale's Copyrights	273	.65	.91	154	.57	.90
2- ITEM-2 not displayed due to the scale's Copyrights	272	.59	.91	146	.50	.90
3- ITEM-3 not displayed due to the scale's Copyrights	269	.64	.91	149	.61	.90
4- ITEM-4 not displayed due to the scale's Copyrights	272	.60	.91	144	.59	.90
5- ITEM-5 not displayed due to the scale's Copyrights	272	.63	.91	148	.66	.90
6- ITEM-6 not displayed due to the scale's Copyrights	270	.64	.91	149	.71	.89
7- ITEM-7 not displayed due to the scale's Copyrights	270	.60	.91	141	.51	.90
8- ITEM-8 not displayed due to the scale's Copyrights	272	.70	.91	143	.69	.90
9- ITEM-9 not displayed due to the scale's Copyrights	270	.54	.91	151	.70	.90
10- ITEM-10 not displayed due to the scale's Copyrights	272	.59	.91	147	.62	.90
11- ITEM-11 not displayed due to the scale's Copyrights	269	.45	.91	148	.40	.90
12- ITEM-12 not displayed due to the scale's Copyrights	270	.60	.91	146	.67	.90
13- ITEM-13 not displayed due to the scale's Copyrights	271	.58	.91	145	.52	.90
14- ITEM-14 not displayed due to the scale's Copyrights	271	.59	.91	140	.47	.90
15- ITEM-15 not displayed due to the scale's Copyrights	266	.58	.91	142	.50	.90
16- ITEM-16 not displayed due to the scale's Copyrights	271	.39	.91	135	.37	.90
17- ITEM-17 not displayed due to the scale's Copyrights	269	.61	.91	139	.40	.90
18- ITEM-18 not displayed due to the scale's Copyrights	272	.57	.91	141	.45	.90
19- ITEM-19 not displayed due to the scale's Copyrights	267	.62	.91	135	.54	.90
20- ITEM-20 not displayed due to the scale's Copyrights	270	.61	.91	138	.59	.90
21- ITEM-21 not displayed due to the scale's Copyrights	272	.52	.91	139	.61	.90
22- ITEM-22 not displayed due to the scale's Copyrights	270	.54	.91	138	.36	.90
23- ITEM-23 not displayed due to the scale's Copyrights	272	.43	.91	136	.58	.90
24- ITEM-24 not displayed due to the scale's Copyrights	269	.67	.91	135	.69	.89
<b>Test scale</b>			<b>.91</b>			<b>.90</b>
<b>ASSP-Social Functioning</b>						
1- Takes turns during games and activities	267	.41	.92	139	.62	.95
2- Asks questions about a person	268	.52	.92	135	.73	.95
3- Asks questions about topics	269	.40	.92	135	.75	.95
4- Maintains "give-and-take" conversations	268	.69	.92	133	.67	.95
5- Expresses sympathy for others	269	.56	.92	133	.67	.95
6- Acknowledges others' interests	269	.65	.92	128	.64	.95
7- Recognizes the facial expressions of others	269	.58	.92	138	.52	.95
8- Understands the jokes or humour of others	269	.57	.92	136	.47	.95
9- Considers multiple viewpoints	269	.68	.92	133	.50	.95
10- Offers assistance to others	269	.53	.92	134	.58	.95
11- Verbally expresses how he/she is feeling	269	.58	.92	135	.76	.95
12- Responds to the greetings of others	269	.50	.92	136	.72	.95
13- Joins a conversation without interrupting	267	.52	.92	131	.67	.95
14- Initiates greetings with others	268	.66	.92	136	.73	.95
15- Provides compliments to others	269	.67	.92	134	.66	.95
16- Politely asks others to move out of the way	269	.67	.92	131	.73	.95
17- Acknowledges compliments from others	269	.62	.92	133	.72	.95
18- Responds to questions directed at him/her	269	.49	.92	134	.77	.95
19- Compromises during disagreements	265	.59	.92	127	.56	.95
20- Introduces self to other	267	.63	.92	127	.76	.95
21- Maintains personal hygiene	265	.42	.92	131	.45	.95
22- Speaks with an appropriate volume	266	.52	.92	126	.64	.95
23- Maintains appropriate distance with peers	266	.46	.92	130	.55	.95
24- Invites peers to join in activities	267	.67	.92	125	.73	.95
25- Joins in activities with peers	267	.61	.92	129	.79	.95
26- Interacts with peers during unstructured activities	265	.65	.92	127	.68	.95
27- Interacts with peers during structured activities	266	.61	.92	122	.79	.95
28- Engages in one-on-one peer interactions	264	.47	.92	130	.77	.95
29- Interacts with groups of peers	262	.57	.92	126	.77	.95
30- Allows peers to join him/her in activities	262	.51	.92	127	.75	.95
31- Responds to peer invitations to join in activities	262	.61	.92	124	.73	.95

32- Engages in positive peer interactions	261	.67	.92	124	.77	.95
33- Engages in solitary interests and hobbies	263	.12*	.92	123	.46	.95
34- Exhibits fear or anxiety about social interactions	264	.04*	.92	122	.27*	.95
35- Engages in solitary activities near peers	264	.08*	.92	125	.14*	.96
<b>Test scale</b>			<b>.92</b>			<b>.95</b>
<b>ASSP-Detrimental Social Behaviours</b>						
1- Changes conversation topic to fit self-interests	263	.55	.73	116	.52	.71
2- Misinterprets the intentions of others	263	.69	.70	124	.60	.70
3- Makes inappropriate comments	261	.70	.70	119	.70	.67
4- Ends conversations abruptly	260	.66	.70	114	.65	.69
5- Fails to read cues to terminate conversations	261	.70	.70	111	.70	.68
6- Experiences negative peer interactions	259	.56	.73	119	.65	.69
7- Engages in socially inappropriate behaviours	259	.57	.72	122	.44	.73
8- Exhibits poor timing with his/her social initiations	256	.70	.70	120	.56	.71
9- Recognizes the "body language" of others	260	.19*	.78	123	.29*	.75
10- Is manipulated by peers	258	.20*	.78	124	.36	.74
<b>Test scale</b>			<b>.75</b>			<b>.73</b>
<b>AQ-Autistic Traits</b>						
1- S/he often notices small sounds when others do not / S/he notices patterns in things all the time	287	.32	.74	167	.31	.56
2- S/he usually concentrates more on the whole picture, rather than the small details / S/he usually concentrates more on the whole picture, rather than the small details	287	.47	.72	159	.38	.54
3- In a social group, s/he can easily keep track of several different people's conversations / In a social group, s/he can easily keep track of several different people's conversations	287	.64	.68	162	.62	.45
4- S/he finds it easy to go back and forth between different activities / If there is an interruption, s/he can switch back to what s/he was doing very quickly	287	.52	.70	163	.57	.47
5- S/he doesn't know how to keep a conversation going with his/her peers / S/he frequently finds that s/he doesn't know how to keep a conversation going	288	.45	.72	158	.34	.55
6- S/he is good at social chit-chat / S/he is good at social chit-chat	288	.70	.67	158	.57	.47
7- When s/he is read a story, s/he finds it difficult to work out the character's intentions or feelings / S/he finds it difficult to imagine what it would be like to be someone else	288	.57	.69	160	.42	.53
8- When s/he was in preschool, s/he used to enjoy playing games involving pretending with other children / When s/he was younger, s/he used to enjoy playing games involving pretending with other children	287	.46	.71	159	.38	.54
9- S/he finds it easy to work out what someone is thinking or feeling just by looking at their face / S/he finds social situations easy	288	.69	.67	160	.42	.52
10- S/he finds it hard to make new friends / S/he finds it hard to make new friends	287	.52	.70	164	.43	.52
<b>Test scale</b>			<b>.72</b>			<b>.54</b>

*Note.* Internal consistency reports are based on the complete (non-imputed) datasets. Items 33, 34, and 35 were removed from the social functioning test scale due to showing a low item-test correlation. Items 9 and 10 were removed from the detrimental social behaviours subscale due to showing a low item-test correlation.

**Table S4***Skewness and Kurtosis Normality Test for Mediator and Dependent Variables*

Variable	Observation	Skewness	Kurtosis	Adjusted chi <sup>2</sup>	Chi2 p
<b>British Sample (N=289)</b>					
Emotion Regulation	289	.34	.78	0.98	.61
Social Functioning	289	.39	.00	24.19	<.001
Detrimental Social Behaviours	289	.44	.29	1.69	.43
Internalising Problems	289	.51	.67	0.62	.73
Externalising Problems	289	.50	.10	3.04	.21
Anxiety	289	.54	.25	1.70	.43
<b>Turkish Sample (N=171)</b>					
Emotion Regulation	171	.95	.94	0.01	.99
Social Functioning	171	.15	.25	3.36	.18
Detrimental Social Behaviours	171	.82	.18	1.84	.39
Internalising Problems	171	.83	.10	2.80	.25
Externalising Problems	171	.95	.01	6.34	.04
Anxiety	171	.01	.26	11.34	.01

*Note.* The normality test is conducted on multiply imputed data sets (N=50).

**Table S5***Logistic Regression Predicting Missingness Pattern (Missing at Random)*

	UK						TR					
	N	Coef.	Std. err.	z	p	CI	N	Coef.	Std. err.	z	p	CI
<i>Missingness</i>												
Autistic Traits	283	.01	.03	0.60	.54	-.04, .07	144	-.01	.04	-0.04	.96	-.07, .07
Victimisation	275	-.03	.02	-1.32	.18	-.07, .02	134	.06	.04	1.44	.15	-.02, .14
Perpetration	279	-.02	.02	-1.03	.30	-.05, .02	148	.02	.04	0.55	.58	-.05, .09
Emotion Regulation	278	.07	.04	1.71	.08	-.01, .15	149	.01	.04	0.19	.85	-.07, .09
Social Functioning	253	-.01	.01	-0.99	.32	-.03, .01	99	.01	.01	0.97	.33	-.01, .03
Detrimental Social Behaviours	253	.01	.03	0.12	.90	-.06, .07	103	-.01	.04	-0.01	.99	-.08, .08
Anxiety	256	-.01	.01	-1.12	.26	-.04, .01	113	.01	.02	0.92	.36	-.02, .05
Internalising Problems	273	.04	.04	0.87	.38	-.05, .12	139	-.04	.05	-0.75	.45	-.13, .06
Externalising Problems	269	.03	.04	0.74	.46	-.05, .11	132	-.03	.05	-0.53	.59	-.14, .08

**Table S6***Missing and Imputed Values in the Demographic and Interest Variables*

	UK				TR			
	Complete	Missing	Imputed	Total	Complete	Missing	Imputed	Total
<b>Demographic-Parent</b>								
Responded (Mother, Father, etc)	288	1	1	289	166	5	5	171
Ethnicity	288	1	1	289	162	9	9	171
Marital	271	18	18	289	150	21	21	171
Parental Education	288	1	1	289	162	9	9	171
Living Area (England, Scotland, Marmara, etc)	288	1	1	289	166	5	5	171
Urban living	288	1	1	289	154	17	17	171
Religion	289	0	0	289	166	5	5	171
Time spent together (Parent-Child)	260	29	29	289	123	48	48	171
<b>Demographic-Children</b>								
Age (ASC)	286	3	3	289	157	14	14	171
Age (NT)	287	2	2	289	167	4	4	171
Gender (ASC)	283	6	6	289	163	8	8	171
Gender (NT)	270	19	19	289	145	26	26	171
Birth Order (ASC)	282	7	7	289	164	7	7	171
Birth Order (NT)	277	12	12	289	152	19	19	171
Number of Sibling	283	6	6	289	150	21	21	171
Sibling Type	274	15	15	289	155	16	16	171
Bullying Disclosure (ASC)	276	13	13	289	138	33	33	171
Bullying Disclosure (NT)	281	8	8	289	141	30	30	171
Time Spent Together (Siblings)	259	30	30	289	119	52	52	171
School type (ASC)	285	4	4	289	167	4	4	171
School attendance (ASC)	258	31	31	289	129	42	42	171
School attendance (NT)	237	52	52	289	119	52	52	171
<b>Interest Variables</b>								
Autistic Traits	283	6	6	289	144	27	27	171
Victimisation	275	14	14	289	134	37	37	171
Perpetration	279	10	10	289	148	23	23	171
Emotion Reg.	278	11	11	289	149	22	22	171
Social Functioning	253	36	36	289	100	71	71	171
Detrimental Social Behaviours	253	36	36	289	103	68	68	171
Anxiety	256	33	33	289	113	58	58	171
Internalising Problems	273	16	16	289	139	32	32	171
Externalising Problems	269	20	20	289	132	39	39	171

*Note.* Missing data imputed using MICE-Regress option (N=50 multiply imputed dataset).

**Table S7***Sibling Bullying Rates by Autistic Child's Demographic Characteristics*

UK (N=289 <sup>1</sup> )								TR (N=171 <sup>a</sup> )						
	N	Sibling bullying Involvement			Sibling Bullying Role			N	Sibling Bullying Involvement			Sibling Bullying Role		
		Sibling victimisation Freq (%)	Sibling perpetration Freq (%)	Sibling bullying Freq (%)	Victim-only Freq (%)	Bully-only Freq (%)	Bully-victim Freq (%)		Sibling Victimisation Freq (%)	Sibling Perpetration Freq (%)	Sibling Bullying Freq (%)	Victim-only Freq (%)	Bully-only Freq (%)	Bully-victim Freq (%)
<b>Overall</b>	289	153 (53)	188 (65)	208 (72)	20 (7)	55 (19)	133 (46)	171	77 (45)	95 (56)	115 (67)	20 (12)	38 (22)	57 (33)
<b>Gender</b>														
Boys	210	110 (52)	136 (65)	151 (72)	15 (7)	41 (19)	95 (45)	137	65 (47)	73 (53)	90 (67)	17 (12)	25 (18)	48 (35)
Girls	79	43 (54)	52 (66)	57 (72)	5 (11)	14 (18)	38 (48)	34	12 (35)	22 (65)	25 (73)	3 (9)	13 (38)	9 (26)
<b>Birth order</b>														
First-born	153	76 (50)	91 (59)	104 (65)	13 (13)	28 (27)	63 (60)	86	44 (51)	57 (66)	65 (76)	8 (9)	21 (24)	36 (42)
Second or later born	136	77 (57)	97 (71)	104 (76)	7 (5)	27 (20)	70 (51)	85	33 (39)	38 (45)	50 (59)	12 (14)	17 (20)	21 (25)
<b>Past sibling victimisation</b>														
Yes	114	85 (74)	93 (82)	101 (88)	8 (7)	16 (14)	77 (67)	41	28 (68)	30 (73)	36 (88)	6 (15)	8 (20)	22 (54)
No	175	68 (38)	95 (54)	107 (61)	12 (7)	39 (22)	56 (32)	130	49 (38)	65 (50)	79 (61)	14 (11)	30 (23)	35 (27)
<b>Past sibling perpetration</b>														
Yes	129	78 (60)	96 (74)	104 (81)	8 (6)	26 (20)	70 (54)	41	23 (56)	29 (71)	35 (85)	6 (15)	12 (29)	17 (41)
No	160	75 (47)	92 (58)	104 (65)	12 (8)	29 (18)	63 (39)	130	54 (41)	66 (51)	80 (61)	14 (11)	26 (20)	40 (31)
<b>Power imbalance</b>														
Weaker <sup>2</sup>	196	123 (63)	127 (65)	144 (73)	17 (9)	21 (11)	106 (54)	56	33 (59)	36 (64)	44 (79)	8 (14)	11 (20)	25 (45)
Stronger	93	30 (32)	61 (66)	64 (69)	3 (3)	34 (37)	27 (29)	115	44 (38)	59 (51)	71 (62)	12 (10)	27 (23)	32 (28)

<sup>1</sup> Multiply imputed datasets (MICE) were used to report descriptives.<sup>2</sup> Autistic child is weaker than the neurotypical sibling and vice versa.

**Table S8***SEM-I: Sibling Bullying Victimization and Mental health: Path Coefficients*

Standardized	UK					TR				
	Coeff.	Std. Err.	z	p	[95% CI]	Coeff.	Std. Err.	z	p	[95% CI]
<b>Victimization</b>										
Autistic Traits	-.33	.05	-6.33	<.001	-.44, -.23	-.08	.07	-1.01	.312	-.23, .07
CVRI	.30	.06	4.75	<.001	.18, .43	.54	.06	8.21	<.001	.41, .67
<b>Emotion Regulation</b>										
Victimization	-.18	.06	-2.73	<.01	-.30, -.05	.01	.07	0.17	.867	-.14, .16
Autistic Traits	-.28	.06	-4.40	<.001	-.40, -.15	-.48	.06	-7.44	<.001	-.61, -.35
<b>Social Functioning</b>										
Victimization	.05	.05	0.92	.358	-.05, .16	.15	.08	1.82	.069	-.01, .30
Autistic Traits	-.57	.05	-12.13	<.001	-.66, -.48	-.61	.06	-10.61	<.001	-.72, -.50
<b>Det. Soc. Behav.</b>										
Victimization	.11	.07	1.76	.078	-.01, .25	.32	.11	2.79	<.01	.10, .55
Autistic Traits	.14	.07	2.12	.034	.01, .27	.04	.09	0.38	.704	-.23, .15
<b>Anxiety</b>										
Victimization	.11	.06	1.67	.095	-.02, .23	.09	.08	1.06	.289	-.08, .27
Autistic Traits	.17	.07	2.26	.024	.02, .31	-.16	.11	-1.40	.160	-.38, .06
Emotion Regulation	-.32	.06	-5.01	<.001	-.45, -.19	-.50	.11	-4.43	<.001	-.73, -.28
Social Functioning	.40	.08	4.94	<.001	.24, .56	-.06	.16	-0.40	.686	-.37, .25
Det. Soc. Behav.	.22	.05	3.88	<.001	.11, .33	.35	.09	3.69	<.001	.16, .53
<b>Internalising Prob.</b>										
Victimization	.13	.06	2.13	.033	.01, .25	.09	.08	1.22	.223	-.06, .25
Autistic Traits	.21	.07	3.07	<.01	.07, .35	.04	.09	0.39	.698	-.15, .22
Emotion Regulation	-.21	.06	-3.52	<.001	-.33, -.09	-.34	.10	-3.37	<.001	-.54, -.14
Social Functioning	.03	.08	0.42	.677	-.12, .18	-.31	.14	-2.21	.027	-.58, -.03
Det. Soc. Behav.	.37	.05	7.27	<.001	.27, .47	.38	.08	4.48	<.001	.21, .53
<b>Externalising Prob.</b>										
Victimization	.14	.06	2.46	.014	.02, .25	.17	.08	2.09	.037	.01, .34
Autistic Traits	-.17	.06	-2.54	<.01	-.30, -.04	-.15	.10	-1.47	.141	-.34, -.05
Emotion Regulation	.04	.06	0.66	.512	-.07, .15	-.17	.11	-1.55	.121	-.39, .05
Social Functioning	-.30	.07	-4.09	<.001	-.44, -.16	-.51	.14	-3.59	<.001	-.79, -.23
Det. Soc. Behav.	.54	.04	-12.02	<.001	.45, .63	.25	.09	2.74	<.01	.07, .43
<b>Covariances</b>										
Emotion Regulation ~ Social Functioning	.46	.04	9.40	<.001	.37, .56	.61	.06	9.70	<.001	.48, .73
Emotion Regulation ~ Det. Soc. Behav.	-.01	.06	0.29	.768	-.14, .10	.06	.10	0.68	.496	-.12, .26
Social Functioning ~ Det. Soc. Behav.	.06	.06	0.93	.351	.06, .18	.29	.10	2.85	<.01	.09, .49
Anxiety ~ Internalising Prob.	.49	.04	10.15	<.001	.40, .59	.53	.07	7.31	<.001	.39, .67
Anxiety ~ Externalising Prob.	-.01	.06	-0.22	.822	-.13, .11	.16	.09	1.64	.102	-.03, .35
Internalising Prob. ~ Externalising Prob.	-.07	.06	-1.23	.218	-.20, .05	.29	.08	3.47	<.001	.12, .46

*Note.* Path coefficients are reported on full sample size using FIML (UK=287, TR=164).

**Table S9***SEM-II: Sibling Bullying Perpetration and Mental Health: Path Coefficients*

Standardized	UK					TR				
	Coeff.	Std. Err.	z	p	[95% CI]	Coeff.	Std. Err.	z	p	[95% CI]
<b>Perpetration</b>										
Autistic Traits	-.03	.05	-0.51	.611	-.14, .08	-.05	.07	-0.67	.501	-.19, .09
CPRI	.46	.05	8.66	<.001	.35, .56	.56	.06	8.79	<.001	.44, .69
<b>Emotion Regulation</b>										
Perpetration	-.29	.05	-5.34	<.001	-.40, -.18	-.03	.07	-0.44	.660	-.18, .11
Autistic Traits	-.23	.05	-4.21	<.001	-.34, -.12	-.48	.06	-7.49	<.001	-.61, -.36
<b>Social Functioning</b>										
Perpetration	-.04	.05	-0.82	.409	-.14, .06	.13	.07	1.74	.081	-.01, .27
Autistic Traits	-.60	.04	-14.93	<.001	-.68, -.52	-.62	.05	-11.05	<.001	-.73, -.51
<b>Det. Soc. Behav.</b>										
Perpetration	.47	.049	9.48	<.001	.37, .57	.37	.08	-4.24	<.001	.20, .54
Autistic Traits	.14	.05	2.52	.012	.03, .24	.04	.09	0.39	.698	-.22, .14
<b>Anxiety</b>										
Perpetration	.23	.06	3.59	<.001	.10, .36	.13	.08	1.55	.121	-.03, .30
Autistic Traits	.16	.07	2.33	.020	.02, .30	-.15	.11	-1.29	.197	-.37, .07
Emotion Regulation	-.27	.06	-4.12	<.001	-.40, -.14	-.49	.11	-4.33	<.001	-.71, -.26
Social Functioning	.39	.07	5.04	<.001	.14, .55	-.06	.16	-0.42	.676	-.38, .24
Det. Soc. Behav.	.12	.06	1.84	.066	.01, .24	.32	.09	3.35	<.001	.13, .51
<b>Internalising Prob.</b>										
Perpetration	.04	.06	0.64	.521	-.09, .17	.19	.07	2.64	<.01	.05, .34
Autistic Traits	.18	.06	2.61	<.01	.04, .31	.05	.09	0.61	.543	-.12, .23
Emotion Regulation	-.23	.06	-3.65	<.001	-.10, -.35	-.33	.10	-3.46	<.001	-.52, -.14
Social Functioning	.05	.08	0.71	.479	-.10, .21	-.32	.13	-2.39	.017	-.58, -.06
Det. Soc. Behav.	.36	.06	5.93	<.001	.24, .47	.35	.08	4.32	<.001	.19, .51
<b>Externalising Prob.</b>										
Perpetration	.35	.05	6.18	<.001	.24, .46	.29	.08	3.40	<.001	.12, .45
Autistic Traits	-.15	.06	-2.59	<.01	-.27, -.04	-.12	.10	-1.23	.217	-.31, .07
Emotion Regulation	.11	.05	1.99	.046	.01, .22	-.15	.11	-1.43	.153	-.36, .06
Social Functioning	-.29	.07	-4.27	<.001	-.42, -.16	-.53	.14	-3.81	<.001	-.79, -.25
Det. Soc. Behav.	.39	.05	7.34	<.001	.29, .49	.20	.09	2.21	.027	.02, .39
<b>Covariances</b>										
Emotion Regulation ~ Social Functioning	.45	.05	8.97	<.001	.35, .55	.61	.06	9.72	<.001	.48, .73
Social Functioning ~ Det. Soc. Behav.	.10	.06	1.50	.134	.03, .22	.30	.09	3.05	<.01	.10, .49
Anxiety ~ Internalising Prob.	.51	.05	10.63	<.001	.41, .60	.52	.07	6.89	<.001	.37, .67
Anxiety ~ Externalising Prob.	-.08	.06	-1.42	.154	-.21, .03	.14	.10	1.41	.158	-.05, .33
Internalising Prob. ~ Externalising Prob.	-.08	.06	-1.31	.189	-.24, .04	.26	.08	3.07	<.01	.09, .43

*Note.* Path coefficients are reported on full sample size using FIML (UK=287, TR=164).



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## Appendix III: Study-III Supplementary Materials

**Table S1**

*Raw score to metric score conversion of the SWEMWBS (Stewart-Brown et al., 2009, p.7)*

<i>Raw Score</i>	<i>Metric Score</i>
7	7
8	9.51
9	11.25
10	12.40
11	13.33
12	14.08
13	14.75
14	15.32
15	15.84
16	16.36
17	16.88
18	17.43
19	17.98
20	18.59
21	19.25
22	19.98
23	20.73
24	21.54
25	22.35
26	23.21
27	24.11
28	25.03
29	26.02
30	27.03
31	28.13
32	29.31
33	30.70
34	32.55
35	35

**Table S2***Testing the Missingness Pattern in the Dataset*

	Odds ratio	Std. err.	Z	P	95% CI
<b>Missingness Pattern</b>					
Sex <sup>1</sup>	.68	.27	-0.93	.351	.30, 1.52
Ethnicity <sup>2</sup>	1.18	.65	0.31	.760	.39, 3.50
Victimisation (Age 11)	.87	.10	-1.17	.241	.69, 1.09
Victimisation (Age 14)	1.12	.13	0.98	.325	.88, 1.42
Perpetration (Age 11)	1.14	.13	1.11	.266	.90, 1.44
Perpetration (Age 14)	.80	.10	-1.66	.097	.61, 1.04
Self-esteem (Age 11)	.94	.06	-0.76	.448	.82, 1.08
Self-esteem (Age 14)	1.03	.06	0.49	.625	.90, 1.17
Internalising Problems (Age 17)	.88	.05	-1.96	.050	.79, 1.00
Externalising Problems (Age 17)	.96	.04	-0.76	.446	.86, 1.06
Wellbeing (Age 17)	.90	.05	-1.77	.077	.80, 1.01

<sup>1</sup> Male<sup>2</sup> White

**Table S3***Missing and Imputed Values*

	Complete	Missing	Imputed	% of missing/imputed values	Total
<b>Demographics</b>					
Ethnicity	403	13	13	3%	416
Sex	410	6	6	1.5%	416
Late diagnosis	372	44	44	11%	416
Birth order	400	16	16	4%	416
Number of siblings	416	0	0	0%	416
Own bedroom	410	6	6	1.5%	416
Family income	355	61	61	15%	416
<b>SEM Variables</b>					
Sibling Victimization (Time 1)	348	68	68	16%	416
Sibling Perpetration (Time 1)	353	63	63	15%	416
Sibling Victimization (Time 2)	288	128	128	31%	416
Sibling Perpetration (Time 2)	286	130	130	31%	416
Self-esteem (Time 1)	335	81	81	20%	416
Self-esteem (Time 2)	281	135	135	32%	416
Internalising Problems (Time 3)	248	168	168	40%	416
Externalising Problems (Time 3)	243	173	173	42%	416

*Note.* Missing data imputed using MICE ( $m=50$ ).

**Table S4***Prevalence of Sibling Bullying by Participants' Demographics (n=416)*

	Bullying Type			Bullying Role		
	Sibling Bullying N (%)	Sibling Victimization N (%)	Sibling Perpetration N (%)	Victim-only N (%)	Perpetrator-only N (%)	Victim-Perpetrator N (%)
<b>Overall</b>	259 (62%)	243 (58%)	168 (40%)	91 (35%)	16 (6%)	152 (59%)
<b>Ethnicity</b>						
White	237 (65%)	224 (61%)	151 (41%)	86 (36%)	13 (6%)	138 (58%)
Non-White	22 (45%)	19 (39%)	17 (35%)	5 (23%)	3 (14%)	14 (63%)
<b>Sex</b>						
Males	197 (61%)	184 (57%)	133 (41%)	64 (32%)	13 (7%)	120 (61%)
Females	62 (68%)	59 (65%)	35 (38%)	27 (43%)	3 (5%)	32 (52%)
<b>Late-Diagnosis</b>						
Late-diagnosed	218 (64%)	206 (61%)	144 (42%)	74 (34%)	12 (6%)	132 (60%)
Early-diagnosed	41 (53%)	37 (48%)	24 (31%)	17 (41%)	4 (10%)	20 (49%)
<b>Birth order</b>						
First-born	109 (65%)	101 (60%)	62 (37%)	47 (43%)	8 (7%)	54 (50%)
Second or later born	150 (60%)	142 (57%)	106 (43%)	44 (29%)	8 (6%)	98 (65%)
<b>Number of siblings</b>						
One-only sibling	107 (55%)	102 (53%)	59 (30%)	48 (45%)	5 (5%)	54 (50%)
Two or more sibling	152 (68%)	141 (64%)	109 (49%)	43 (28%)	11 (7%)	98 (65%)
<b>Having own bedroom</b>						
Own	173 (60%)	162 (56%)	108 (38%)	65 (38%)	11 (6%)	97 (56%)
Shared	86 (67%)	81 (63%)	60 (47%)	26 (30%)	5 (6%)	55 (64%)
<b>Family income</b>						
High <sup>1</sup>	160 (58%)	150 (54%)	99 (36%)	61 (38%)	10 (6%)	89 (56%)
Low <sup>2</sup>	99 (70%)	93 (66%)	69 (49%)	30 (30%)	6 (6%)	63 (64%)

*Note.* Descriptive statistics are reported on the multiply imputed data sets ( $m=50$ ) MICE.

<sup>1</sup> OECD above median income

<sup>2</sup> OECD below median income

**Table S5**

*Sensitivity SEM1(N=416)*

Standardised	$\beta$	SE	z	p	95% CI
<b>Direct Pathways</b>					
Sibling Victimisation (T1) → Self-Esteem (T2)	<b>-.14</b>	.05	-2.55	<b>&lt;.01</b>	-.24, -.03
Sibling Victimisation (T1) → Internalising Problems (T3)	-.09	.08	-1.03	.304	-.26, .08
Sibling Victimisation (T1) → Externalising Problems (T3)	.10	.08	1.29	.196	-.05, .26
Sibling Victimisation (T1) → Wellbeing (T3)	.05	.06	0.84	.403	-.07, .18
Self-Esteem (T1) → Self-Esteem (T2)	<b>.39</b>	.05	7.64	<b>&lt;.001</b>	.29, .49
Self-Esteem (T1) → Internalising Problems (T3)	-.01	.10	-0.16	.871	-.22, .19
Self-Esteem (T1) → Externalising Problems (T3)	-.05	.09	-0.57	.571	-.24, .13
Self-Esteem (T1) → Wellbeing (T3)	.01	.08	0.14	.886	-.14, .16
Self-Esteem (T2) → Internalising Problems (T3)	<b>-.31</b>	.09	-3.13	<b>&lt;.01</b>	-.50, -.11
Self-Esteem (T2) → Externalising Problems (T3)	<b>-.32</b>	.08	-3.81	<b>&lt;.001</b>	-.48, -.15
Self-Esteem (T2) → Wellbeing (T3)	<b>.33</b>	.06	4.90	<b>&lt;.001</b>	.20, .46
<b>Concurrent Associations</b>					
Externalising Problems (T3) ↔ Wellbeing (T3)	<b>-.49</b>	.06	-7.22	<b>&lt;.001</b>	-.62, -.35
Internalising Problems (T3) ↔ Wellbeing (T3)	<b>-.57</b>	.10	-5.52	<b>&lt;.001</b>	-.77, -.36
Externalising Problems (T3) ↔ Internalising Problems (T3)	<b>.80</b>	.13	5.87	<b>&lt;.001</b>	.53, 1.06
<b>Covariates</b>					
Ethnicity → Sibling Victimisation (T1)	<b>.15</b>	.05	2.55	<b>.011</b>	.03, .26
Sex → Sibling Victimisation (T1)	-.04	.05	-0.85	.394	-.15, .05
Late Diagnosis → Sibling Victimisation (T1)	.09	.05	1.65	.098	-.01, .21
Birth order → Sibling Victimisation (T1)	-.03	.05	-0.72	.472	-.14, .06
Own Bedroom → Sibling Victimisation (T1)	<b>-.12</b>	.05	-2.34	<b>.019</b>	-.23, -.02
Family Income → Sibling Victimisation (T1)	.07	.05	1.44	.150	-.02, .18
Ethnicity → Self-Esteem (T2)	-.08	.05	-1.45	.146	-.19, .02
Sex → Self-Esteem (T2)	<b>.23</b>	.04	4.95	<b>&lt;.001</b>	.14, .33
Late Diagnosis → Self-Esteem (T2)	-.06	.05	-1.08	.281	-.17, .05
Birth order → Self-Esteem (T2)	<b>-.14</b>	.05	-2.73	<b>&lt;.01</b>	-.24, -.04
Sex → Internalising Problems (T3)	<b>-.37</b>	.07	-5.18	<b>&lt;.001</b>	-.52, -.23
Family income → Internalising Problems (T3)	<b>.25</b>	.08	2.91	<b>&lt;.01</b>	.08, .41
Family income → Externalising Problems (T3)	.12	.07	1.69	.091	-.02, .27
Ethnicity → Externalising Problems (T3)	.04	.06	0.51	.611	-.10, .17
Late diagnosis → Externalising Problems (T3)	.07	.07	1.08	.280	-.06, .21
Late diagnosis → Wellbeing (T3)	-.03	.05	-0.62	.533	-.15, .07
Family income → Wellbeing (T3)	<b>-.14</b>	.05	-2.44	<b>.015</b>	-.26, -.02
<b>Factor Loadings</b>					
Internalising Problems (T3) → Emotional Problems (T3)	<b>.67</b>	.07	9.59	<b>&lt;.001</b>	.53, .81
Internalising Problems (T3) → Peer Problems (T3)	<b>.43</b>	.06	6.64	<b>&lt;.001</b>	.30, .56
Externalising Problems (T3) → Conduct Problems (T3)	<b>.62</b>	.05	11.24	<b>&lt;.001</b>	.51, .73
Externalising Problems (T3) → Hyperactivity (T3)	<b>.77</b>	.05	13.90	<b>&lt;.001</b>	.66, .87

Note. Model Fit=  $\chi^2(35) = 39.28$ ,  $\chi^2(p) = .284$ , RMSEA = 0.017, CFI = 0.99, TLI = 0.98, CD = 0.61.



**Table S6**

*Sensitivity SEM2 (N=416)*

Standardised	$\beta$	SE	z	p	95% CI
<b>Direct Pathways</b>					
Sibling Perpetration (T1) → Self-Esteem (T2)	<b>-.14</b>	.05	-2.59	<b>&lt;.01</b>	-.24, -.03
Sibling Perpetration (T1) → Internalising Problems (T3)	-.14	.08	-1.55	.121	-.30, .03
Sibling Perpetration (T1) → Externalising Problems (T3)	.13	.07	1.55	.120	-.03, .28
Sibling Perpetration (T1) → Wellbeing (T3)	-.08	.06	-1.26	.209	-.21, .04
Self-Esteem (T1) → Self-Esteem (T2)	<b>.39</b>	.05	7.56	<b>&lt;.001</b>	.29, .49
Self-Esteem (T1) → Internalising Problems (T3)	-.01	.10	-0.15	.878	-.22, .19
Self-Esteem (T1) → Externalising Problems (T3)	-.06	.09	-0.63	.526	-.24, .12
Self-Esteem (T1) → Wellbeing (T3)	.01	.07	0.22	.827	-.13, .17
Self-Esteem (T2) → Internalising Problems (T3)	<b>-.32</b>	.09	-3.26	<b>&lt;.001</b>	-.52, -.13
Self-Esteem (T2) → Externalising Problems (T3)	<b>-.31</b>	.08	-3.71	<b>&lt;.001</b>	-.47, -.15
Self-Esteem (T2) → Wellbeing (T3)	<b>.30</b>	.06	4.54	<b>&lt;.001</b>	.17, .44
<b>Concurrent Associations</b>					
Externalising Problems (T3) ↔ Wellbeing (T3)	<b>-.47</b>	.06	-6.88	<b>&lt;.001</b>	-.61, -.33
Internalising Problems (T3) ↔ Wellbeing (T3)	<b>-.59</b>	.10	-5.73	<b>&lt;.001</b>	-.80, -.39
Externalising Problems (T3) ↔ Internalising Problems (T3)	<b>.82</b>	.13	5.93	<b>&lt;.001</b>	.54, 1.09
<b>Covariates</b>					
Ethnicity → Sibling Perpetration (T1)	-.01	.05	-0.08	.933	-.12, .11
Sex → Sibling Perpetration (T1)	.01	.05	0.23	.820	-.09, .11
Late Diagnosis → Sibling Perpetration (T1)	<b>.13</b>	.06	2.25	<b>.025</b>	.01, .25
Birth order → Sibling Perpetration (T1)	-.01	.05	-0.23	.815	-.11, .09
Own Bedroom → Sibling Perpetration (T1)	-.05	.05	-1.01	.315	-.16, .05
Family Income → Sibling Perpetration (T1)	.10	.05	1.86	.063	-.01, .21
Ethnicity → Self-Esteem (T2)	-.09	.05	-1.77	.077	-.20, .01
Sex → Self-Esteem (T2)	<b>.24</b>	.05	5.15	<b>&lt;.001</b>	.15, .34
Late Diagnosis → Self-Esteem (T2)	-.06	.05	-1.04	.297	-.17, .05
Birth order → Self-Esteem (T2)	<b>-.14</b>	.05	-2.66	<b>&lt;.01</b>	-.23, -.03
Sex → Internalising Problems (T3)	<b>-.36</b>	.07	-5.02	<b>&lt;.001</b>	-.51, -.22
Family income → Internalising Problems (T3)	<b>.25</b>	.08	3.02	<b>&lt;.01</b>	.09, .42
Family income → Externalising Problems (T3)	.12	.07	1.67	.096	-.02, .27
Ethnicity → Externalising Problems (T3)	.06	.07	0.83	.404	-.07, .19
Late diagnosis → Externalising Problems (T3)	.07	.07	1.00	.315	-.06, .21
Late diagnosis → Wellbeing (T3)	-.02	.06	-0.50	.619	-.14, .08
Family income → Wellbeing (T3)	<b>-.13</b>	.05	-2.26	<b>.024</b>	-.25, -.01
<b>Factor Loadings</b>					
Internalising Problems (T3) → Emotional Problems (T3)	<b>.66</b>	.06	9.74	<b>&lt;.001</b>	.53, .80
Internalising Problems (T3) → Peer Problems (T3)	<b>.43</b>	.06	6.75	<b>&lt;.001</b>	.30, .56
Externalising Problems (T3) → Conduct Problems (T3)	<b>.62</b>	.05	11.31	<b>&lt;.001</b>	.51, .73
Externalising Problems (T3) → Hyperactivity (T3)	<b>.76</b>	.05	13.73	<b>&lt;.001</b>	.65, .87

*Note.* Model Fit=  $\chi^2(35) = 38.09$ ,  $\chi^2(p) = .330$ , RMSEA = 0.01, CFI = 0.99, TLI = 0.98, CD = 0.63.

**Table S7***Sensitivity Mediation Findings (n=416)*

Mediation Pathways	Standardised Coefficients			Sobel Test				
	X -> M	M -> Y	X -> Y	Ind. eff.	Std. err.	z	p	95% CI
	$\beta$ (p)	$\beta$ (p)	$\beta$ (p)					
Sibling Victimization (T1) → Self-Esteem (T2) → Internalising Problems (T3)	-.139 ( <b>&lt;.01</b> )	-.309 ( <b>.002</b> )	-.091 (.304)	.043	.022	1.98	<b>.048</b>	.00, .09
Sibling Victimization (T1) → Self-Esteem (T2) → Externalising Problems (T3)	-.139 ( <b>&lt;.01</b> )	-.316 ( <b>&lt;.001</b> )	.103 (.196)	.044	.021	2.11	<b>.034</b>	.01, .08
Sibling Victimization (T1) → Self-Esteem (T2) → Wellbeing (T3)	-.139 ( <b>&lt;.01</b> )	.330 ( <b>&lt;.001</b> )	.055 (.403)	-.046	.020	-2.26	<b>.024</b>	-.08, -.01
Sibling Perpetration (T1) → Self-Esteem (T2) → Internalising Problems (T3)	-.140 ( <b>&lt;.01</b> )	-.322 ( <b>&lt;.001</b> )	-.136 (.121)	.045	.022	2.03	<b>.043</b>	.01, .09
Sibling Perpetration (T1) → Self-Esteem (T2) → Externalising Problems (T3)	-.140 ( <b>&lt;.01</b> )	-.310 ( <b>&lt;.001</b> )	.124 (.120)	.043	.020	2.12	<b>.034</b>	.01, .08
Sibling Perpetration (T1) → Self-Esteem (T2) → Wellbeing (T3)	-.140 ( <b>&lt;.01</b> )	.310 ( <b>&lt;.001</b> )	-.085 (.193)	-.043	.019	-2.25	<b>.024</b>	-.08, -.01

## Appendix IV: Study-IV Supplementary Materials

**Table S1**

*Parents' Demographics by Country*

	UK (n=164)	TR (N=87*)
<b>Respondent</b>		
Mother	142 (87%)	78 (90%)
Father	22 (13%)	9 (10%)
<b>Ethnicity</b>		
White	148 (90%)	-
Turkic	-	75 (86%)
Other	16 (10%)	12 (14%)
<b>Education</b>		
College degree or above	94 (57%)	19 (22%)
Below college degrees	70 (43%)	68 (78%)
<b>Marital Status</b>		
Married (First, second, or later)	128 (78%)	69 (80%)
Non-married (Single, cohabiting, separated, divorced, other)	38 (22%)	17 (19%)
Not reported	-	1 (1%)
<b>Working Status</b>		
Employed	112 (68%)	19 (22%)
Unemployed	52 (32%)	63 (72%)
Not reported	-	5 (6%)
<b>Living Area</b>		
England	157 (96%)	
Scotland	3 (2%)	
Wales	4 (2%)	
Marmara (Greater Istanbul)	-	39 (45%)
Mediterranean	-	23 (24%)
Aegean	-	11 (14%)
Other (Black Sea, Middle, Eastern, or Southeastern Anatolia)	-	14 (17%)
<b>Urban living</b>		
Urban	124 (76%)	76 (87%)
Rural	40 (24%)	11 (13%)

*Note.* \* Of 96 Turkish parents, 9 participants did not report any demographic information.