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Bullying Victimization through an Interpersonal Lens: Focussing on Social Interactions and Risk for Depression

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Chapter 2

A Call for Studying Interpersonal Characteristics of Victims of Bullying: Novel Approaches and Measures

Chapter 2 is based on: Franzen, M., de Jong, P. J., Veenstra, R., & aan het Rot, M. (Manuscript in preparation). A Call for Studying Interpersonal Characteristics of Victims of Bullying: Novel Approaches and Measures.

Abstract

In comparison to persons without bullying experiences, victims of bullying have been suggested to have more maladaptive interpersonal characteristics and more interpersonal conflicts. However, these findings are mostly based on retrospective questionnaire-based studies, whereas victims' interpersonal attributes have barely been systematically studied. As a consequence, little is known about causal or predictive relations between victimisation and interpersonal functioning. To fill this gap, in this commentary, we call for studying the interpersonal characteristics of victims of bullying using (1) performance-based measures of interpersonal functioning, (2) experimental designs focusing on the manipulation of interpersonal processes, and (3) intensive-repeated measures of interpersonal functioning in naturalistic settings. We argue that applying those methods can help to better understand victims' interpersonal problems and may also help understand the role of victims' interpersonal characteristics in explaining their risk for mental health problems.

Introduction

Social interactions are part of daily life. Interpersonal characteristics of individuals influence and are influenced by group dynamics and social relationships and, over time, can impact the risk for mental health problems. One example of impactful social interactions is the experience of being bullied. In comparison to persons without bullying experiences, victims of bullying face an increased risk for psychopathology and have also been suggested to have more maladaptive interpersonal characteristics. Nevertheless, victims' interpersonal attributes have barely been systematically studied. As a consequence, little is known about the role of victims' interpersonal characteristics in explaining their risk for mental health problems. To fill this gap, in this commentary, we call for and provide specific suggestions for studying the interpersonal characteristics of victims of bullying using experimental approaches and intensive repeated measures.

Bullying and psychopathology

Bullying victimisation can have negative effects on mental health. Victims of bullying have a higher risk for psychopathology than individuals who have not been exposed to such acts of interpersonal aggression. For example, victims are more likely to experience anxiety disorders and depression and to report suicidal ideation (Holt et al., 2015; Moore et al., 2017; Schoeler et al., 2018; van Geel et al., 2021). Results from a meta-analysis indicate that victims continue to have an increased risk for depression even 36 years after the bullying (Ttofi et al., 2011). Frequent childhood bullying experiences have also been positively linked to various anxiety disorders at the age of 45 (Takizawa et al., 2014). These findings indicate that the impact on bullying victimisation can last a lifetime.

Many studies have examined this link between bullying victimisation and psychopathology. Nonetheless, the question remains how this link can be explained, particularly as years or even decades might pass between victims' bullying experiences and the development of psychopathology. This warrants research on which psychological processes may help explain the detrimental sequelae of being bullied. We suggest to systematically study victims' interpersonal characteristics.

Such a systematic approach can help elucidate how interpersonal processes explain the link between victimisation and psychopathology. However, most studies on victims' interpersonal characteristics to date have involved correlational and between-subjects designs. Here we argue

that focusing on causal pathways and within-subject effects will bring important additional insights. These may be accomplished by using experimental designs, performance-based measures, and intensive repeated measures, respectively.

Bullying as an interpersonal phenomenon

Bullying is usually defined as an act of systematic, repetitive, and intentional aggression towards someone who lacks power to self-defend (Olweus, 1994). It is considered a group phenomenon as it often entails not only perpetrators and victims but also bystanders who either assist the perpetrators or support and defend the victims (Salmivalli, 2014). Consequently, bullying is often studied in groups, such as in classrooms. Group dynamics are increasingly examined using social network analyses (e.g., Wölfer et al., 2015; Wölfer & Hewstone, 2017). This type of data analysis also offers valuable insights into the relation between bullies and victims and how these might develop over time (e.g., Hooijsma et al., 2020; Huitsing & Veenstra, 2012; Rambaran et al., 2020).

At the same time, bullying can also be seen as an interpersonal psychological phenomenon, involving a perpetrator and a victim repeatedly engaging in social interactions. In this context, we define social interactions as discrete interpersonal events, involving at least two individuals who respond to one another for a significant amount of time. An interaction between a perpetrator and a victim involves a dynamic interplay of both individuals' behaviours, perceptions, and affect (cf. Hopwood et al., 2019; Pincus, 2005; Pincus & Ansell, 2013). Importantly, this interplay of behaving, perceiving, and feeling is impacted by both persons' past interpersonal experiences and expectations of future experiences. More generally, interpersonal situations are seen as crucial human experiences where, over the course of life, social learning occurs and that play a key role in every person's development (Hopwood et al., 2019, 2021; Hopwood et al., 2013). This is why examining not only the interactions between perpetrators and victims, but also the interactions of perpetrators and victims with others, is important to gain insights into their overall interpersonal functioning. Focusing on victims, learning more about how they behave, perceive, and feel during interactions with perpetrators and others might also teach us how victims of bullying may develop psychopathology over time.

Changes in interpersonal functioning as a link between bullying victimisation and psychopathology

Several researchers (e.g., Arseneault, 2018; Hansen et al., 2012; Klomek et al., 2015) have previously suggested that an interpersonal perspective is necessary to explain the negative mental-health consequences of bullying victimisation. In line with this suggestion, exposure to interpersonal stress has been shown to increase the chances of depression (Gerke et al., 2018; Vrshek-Schallhorn et al., 2015) and social anxiety (Hamilton et al., 2016; Schneider et al., 2020). Bullying is considered a significant interpersonal stressor, particularly when victims are the recipient of aggression over long time periods, such as throughout high school.

Taking an interpersonal perspective holds that bullying may both affect, and be affected by, a victim's interpersonal style. On the one hand, the interpersonal characteristics of some individuals can increase their chance of initial victimisation. For example, individuals who are insecure, or in a low status position in the group, have a higher risk of becoming the targets of bullying (Kljakovic & Hunt, 2016; Salmivalli et al., 2013; Vaillancourt et al., 2013). Individuals may be perceived as “easy targets” by potential bullies who aim to increase their status in the group by bullying others (Salmivalli, 2010). On the other hand, for the victim, bullying victimisation can elicit or further increase insecurities, feelings of unsafety, and submissiveness (Isaacs et al., 2008; McDougall & Vaillancourt, 2015; Smith, 2016). Some victims might react defensively as a means to try and take back control over the situation (Reijntjes, Kamphuis, et al., 2011; Zych et al., 2015). However, these interpersonal reactions might not help the victim over time and might actually increase the chance for being victimised again.

Importantly, some of the victim's interpersonal characteristics and reactions might first appear only in situations with bullies but, due to social learning, spill over to situations with others. This may lead to rejection by others and interpersonal conflicts with individuals who have never bullied them. Due to continuous negative social experiences, feelings of isolation, self-criticism, and worthlessness can increase, which are considered precursors of depression (Ehret et al., 2015; Santini et al., 2020; Segrin, 2011). Experiencing depression is often accompanied by social withdrawal, irritability and quarrelsomeness, and negative cognitions about the self and others (Erzen & Çikrikci, 2018; Hong & Cheung, 2015; Park et al., 2020; Stringaris et al., 2013). Those behaviours and perceptions can in turn again increase the chance of experiencing more stressful interpersonal life events (Moskowitz, 2009, 2010). A self-perpetuating interpersonal cycle might develop (cf. Kiesler, 1982; Kiesler, 1986).

Past studies on bullying victimization and interpersonal functioning

In support of the idea that bullying victimisation is associated with alterations in interpersonal functioning, multiple cross-sectional studies have shown that victims can struggle interpersonally. Compared with individuals with no bullying experiences, victims indicate that they more often lack high quality friendships and support systems (Demaray & Malecki, 2003; Fitzpatrick & Bussey, 2014; Jantzer & Cashel, 2017) which can serve as an external buffer against developing mental health problems (see Ttofi et al., 2014 for a meta-analysis). In other studies, peers as well as victims themselves indicate they are submissive and lack assertiveness (e.g., Gökhan et al., 2012; Sijtsema et al., 2009), or are easily frustrated and reacting in a hostile way when triggered by others (e.g., Manring, Christian Elledge, et al., 2018; Sijtsema et al., 2009). More generally, victims often blame themselves for problematic situations (Boulton, 2013; Chen & Chen, 2019). Apart from these questionnaire-based studies, a recent review summarised fMRI studies showing victims to have a heightened neural sensitivity for or fear of being rejected by others (Güroğlu & Veenstra, 2021). Importantly, these interpersonal characteristics of victims of bullying are similar to those found in samples with depression and anxiety (e.g., Dawood et al., 2013; Girard et al., 2017; Martin & Dahlen, 2005; Zahn et al., 2015).

Although many previous studies have a cross-sectional design and therefore provide limited information on how victims may develop broader interpersonal struggles, there is also some longitudinal evidence for this (Prino et al., 2019; Schoeler et al., 2019). At the same time, some studies report victims to struggle interpersonally prior to bullying experiences (Cook et al., 2010; Kljakovic & Hunt, 2016). This indicates that it is likely that the relation between victimisation history and interpersonal style is bidirectional in nature, which helps explain why a self-perpetuating interpersonal cycle may develop and, over time, lead to psychopathology.

Although there is some evidence regarding associations between victimisation and interpersonal struggles, causal relations remain understudied. In this commentary, we take bullying victimisation as a starting point and focus on subsequent interpersonal functioning. This focus, we argue, will help to increase knowledge about how victims' interpersonal characteristics might explain their risk for developing psychopathologies as well as other interpersonal conflicts.

Purpose of this commentary

In this commentary, we propose that researchers interested in the interpersonal characteristics of bullying victims and how these might relate to group dynamics and risk for psychopathology consider the following methodological options: (1) performance-based measures of interpersonal functioning, (2) experimental designs focusing on the manipulation of interpersonal processes, and (3) intensive-repeated measures of interpersonal functioning in naturalistic settings. To this effect, we present several options that have been used in the bullying field,² and others that have not been used in the bullying field, but that have been used in the field of psychopathology. By using these methodologies to more systematically examine interpersonal functioning of victims of bullying, we think bullying research can yield more insight into the causal pathways and within-person processes that play out in victims of bullying such that they increase victims' risk for psychopathology. This type of knowledge may be critical for designing effective interventions for victims, to prevent them from developing psychopathology, and may even be used to help prevent bullying victimisation.

We first present experimental approaches useful in studying victims' interpersonal characteristics. In line with Glashouwer et al. (2020), we differentiate between (1) performance-based measures and (2) experimental designs. In both cases, relevant factors are studied in a controlled environment. Specifically, in experimental designs, relevant factors (in this case an interpersonal situation or characteristic) are also systematically manipulated. This way, causal processes can be tested, which is a crucial step to evolve theory into practice (Glashouwer et al., 2020; Nielsen et al., 2018).

Additionally, we present intensive repeated measures in naturalistic settings (IRM-NS; Mehl & Conner, 2014; Moskowitz et al., 2009) as a valuable way to learn more about victims' interpersonal functioning. IRM-NS focuses on the role of context as a significant source of within-person variation and offers to examine within-person causal inferences. Therefore, IRM-NS complements experimental designs by offering a next step from the theoretical understanding of victims' interpersonal functioning towards a more real-life understanding of interpersonal processes of victims.

² See supplementary table for an overview of studies.

1. Performance-based measures to study interpersonal functioning

Performance-based measures create a controlled and comparable environment for all participants (e.g., a standard interpersonal situation). In this way they are different to most questionnaire-based studies, which are more prone to between-person differences in the interpretation of the interpersonal situation in question and hence to participants completing the questionnaire differently. Using performance-based measures, responses can be compared more reliably between groups as everyone is exposed to the same interpersonal situation. Various studies have applied performance-based measures to examine interpersonal characteristics of bullying victims. These measures include interpersonal stressors that represent situations varying in how close they are to actual victimisation experiences.

For example, the Social Competence Interview (SCI; as adapted by Breslend et al., 2018; Murray-Close et al., 2014) has been used to examine responses to memories of victimisation experiences. Interviewees are given a stack of cards containing examples of instrumental and relational peer provocations and asked to select one situation per category that they have most often experienced and to reconstruct the event using imagery techniques. Studies to date have shown more pronounced physiological responses to these remembered stressful interpersonal situations in individuals with more victimisation experiences (Breslend et al., 2018; Murray-Close et al., 2014).

A similar task that has also been used in bullied populations is the Trier Social Stress Test (TSST; Kirschbaum et al., 1993). The TSST offers to study reactions to social evaluation by means of a public speaking task. Participants completing the TSST are asked to perform a speech in front of an ostensible evaluation committee and a camera. In studies conducted in victims, the speech often involved discussing an interpersonal topic. Sometimes, the topic has been more closely linked to potential bullying experiences, such as recalling the most unpleasant experience at school (Ouellet-Morin et al., 2011). In other studies, topics were less related to bullying experiences but most still concern interpersonal content. That is, describing a person the participant considered most important to them (Chen et al., 2018) or how to make friends (Giletta et al., 2018). Studies found greater physiological stress responses in victimised individuals compared to non-involved peers. More specifically, victims had a greater cortisol reactivity (Chen et al., 2018; Ouellet-Morin et al., 2011) as well as lower systolic blood pressure than non-involved peers, which in one study was

qualified by feelings of anger towards others (Hamilton et al., 2008). More frequently victimised individuals also exhibited greater inflammatory cytokines responses (Giletta et al., 2018).

Whereas in bullied populations the TSST has been performed with a real-life evaluation committee, studies outside the bullying field have also used virtual reality (VR) versions in which the committee consist of avatars which can give pre-recorded verbal and/or behavioural responses (see Frisch et al., 2015 for a review). Using VR enables more standardised committee-behaviours and hence increased experimental control compared to the more externally valid real-life TSST. Most studies that have used VR TSSTs used non-clinical samples (e.g., Jönsson et al., 2010; Kerous et al., 2020; Kothgassner et al., 2016). Besides, VR public speaking tasks similar to the TSST have been successfully applied in individuals with clinical anxiety (e.g., Grillon et al., 2006; Slater et al., 2006). In sum, the TSST offers the opportunity to study reactions to social evaluation that are more or less explicitly linked to previous bullying experiences (i.e., depending on the topic of the speech) and with varying degrees of experimental control of the interpersonal stressor (i.e., real-life vs. VR).

Another interpersonal stress task is the Social Challenge Task (SCT; Rudolph et al., 2009). During the SCT, a competition situation is created between two unfamiliar participants by promising a prize to the one who first finishes a building task. After a certain period of time, both participants are informed that each will receive a prize and instructed to discuss the distribution of two unequal prizes. Therefore, the SCT enables studying reactions to feelings of inequality. Past studies have reported victimisation to be positively related to physical stress responses (Monti et al., 2014), frustration during the task (Rudolph et al., 2010), and rumination (Monti et al., 2017). In comparison to the TSST or SCI, the interpersonal stressor created during the SCT seems relatively unrelated to past bullying experiences. However, feelings of inequality can remind victims of the power imbalance of the bullying situation and therefore might be more stressful to them than to peers without a bullying history.

The Facial emotional response task (FERT; aan het Rot et al., 2014) can be another performance-based experimental measure to assess interpersonal characteristics. Participants are presented with photographs of persons displaying various facial expressions and are asked to indicate how they were to behave towards this person. Facial expressions include anger and disgust which may elicit feelings of being rejected by others; that is, in individuals in general, but potentially more so in victims due to their past bullying experiences. The FERT offers to assess likely

behavioural responses to elicited feelings of rejection (amongst others). It has been applied in a sample with varying degrees of social anxiety (aan het Rot et al., 2021) which commonly occurs in victims (Moore et al., 2017). To our knowledge it has not yet been applied in individuals with victimisation experiences.

The tasks presented so far offer to assess reactivity (e.g., behavioural, physical, emotional) to interpersonal stressors. However, which response manifests itself depends often on the initial perception and subsequent interpretation of the respective social situation (cf. Hopwood et al., 2019). For example, how another person's facial emotion expression is perceived and interpreted will likely influence potential responses. This is why emotion recognition paradigms are also important to be considered when studying victims' interpersonal functioning. Although negative emotions can serve as reminders of past interpersonal stressors such as bullying, also the perception of neutral and positive facial expressions are interesting to study. Perceiving neutral or positive facial expressions as negative can indicate a hostile attribution bias which is associated with mistrusting others and more interpersonal problems (de Castro et al., 2002). Indeed this has been reported in victims of bullying (e.g., Yao & Enright, 2021). Facial emotion recognition studies in bullied populations have presented participants with photographs or morphed video clips with varying facial expressions as interpersonal stimuli (e.g., DiLalla & John, 2020; Pozzoli et al., 2017) VR emotion recognition tasks are also available but, to our knowledge have not been used in victims of bullying. They have been used in individuals with a psychotic disorder. Specifically, while walking through a virtual environment (e.g., a shopping mall), participants were asked to directly approach avatars and indicate which emotion they perceive in the avatars' faces (Nijman et al., 2020). Victims of bullying have been reported to have trouble in correctly identifying facial emotions (e.g., Ciucci et al., 2014). This might influence potential responses in performance-based (and other) experimental measures such as the TSST and the FERT and should therefore be considered an important interpersonal skill to be systematically studied in victims of bullying.

Until now, we have presented a variety of performance-based experimental measures that enable us to study the reactivity to more (e.g., VR TSST) or less (e.g., real-life TSST) controlled and comparable interpersonal stressors; stressors that more (e.g., actively recalling experienced peer victimisation as in the SCI) or less (e.g., inequality as in the SCT) explicitly remind victims of previous bullying incidents or that are even unrelated to such past experiences (e.g., happy facial expressions as in the FERT). As mentioned above, how these experimental measures differ from

experimental designs is that they do not include a manipulation of the interpersonal situation. Nonetheless, many of these measures can be adjusted to create such a manipulation. Specifically, the SCI could also include a control condition in which a neutral interpersonal experience is recalled, the TSST could have a control condition in which the audience is supportive as compared to judgmental, and the SCT could have a control condition in which prizes of equal value need to be distributed. Overall, these tasks already offer to systematically study interpersonal functioning of victims and have the potential to be turned into actual experimental designs that offer an even deeper understanding of the relation between victimisation experiences and interpersonal functioning.

2. Manipulating interpersonal functioning using experimental designs

Apart from using performance-based measures, various studies of victims' interpersonal functioning have involved manipulating interpersonal stressors. These studies include an experimental manipulation of a factor (in our case an interpersonal situation or characteristic), meaning that effects of an experimental condition are compared to those of a control condition (e.g., being socially excluded vs. not). This way, interpersonal responses to the two conditions can be compared. In the following paragraph, we present various experimental designs that have been or can be used to study interpersonal functioning in victims. These studies variably involve interpersonal situations that more or less resemble bullying victimisation experiences.

One experimental task that has been used repeatedly to study interpersonal functioning in response to an interpersonal stressor is the Cyberball paradigm (Williams et al., 2000). It offers studying the effects of interpersonal rejection in a way that is considered comparable to bullying victimisation. The Cyberball task is a virtual ball-tossing game in which, after a certain period of time, the study participant no longer receives the ball from the other players involved, who are in fact computer generated. The experimental manipulation thus involves social exclusion, which may be interpreted as interpersonal rejection and comparable to a bullying situation. Sometimes participants are made aware that they are playing against the computer and asked to imagine playing against their best friends (Mazzone et al., 2017). In other studies, participants were led to believe they were playing against other participants situated in another room (Lansu et al., 2017; McIver et al., 2018; Rudolph et al., 2016; Ruggieri et al., 2013; Telzer et al., 2018). VR versions of

the Cyberball task also exist which, so far, have mainly been applied in non-bullied and non-clinical samples (e.g., Kassner et al., 2012; Kothgassner et al., 2021; Kothgassner et al., 2017; Kothgassner et al., 2014).

A similar task assessing reactivity to sudden social exclusion is the Chatroom Interact Task (CIT; Silk et al., 2014). In this task, participants assume that they interact in an online chat with two other peers (who in fact are computer-generated and fictional). The social rejection manipulation consists of the peers choosing each other, and not the participant, to discuss various topics. Compared to the Cyberball paradigm, the CIT is thought to more closely resemble day-to-day peer social rejection experiences, especially in adolescence, as it involves exclusion from a conversation rather than a ball-tossing game. Overall, this study and the Cyberball studies have shown victims' neural (e.g., McIver et al., 2018; Oppenheimer et al., 2020) physiological (e.g., Mazzone et al., 2017), behavioural (e.g., Telzer et al., 2018), and emotional (e.g., Lansu et al., 2017) reactivity to social exclusion. Most relevant here is that both tasks involve a rejection situation that is considered similar to a bullying situation and offer systematic assessment of victims' responses to such an interpersonal stressor.

Another relevant set of computerised tasks are social approach avoidance tasks (AATs). Although they have not been used in victims of bullying, social AATs have been used in individuals with social anxiety, both with an original and a VR design. Using VR, participants have been instructed to either approach avatars (e.g., Wieser et al., 2010) or directly pass avatars with facial expressions that could be interpersonally distressing on their way to a specific destination (e.g., Lange & Pauli, 2019; Rinck et al., 2010). By also measuring interpersonal distance and the participants' gaze, the latter set-up offers an even more complete or ecologically valid representation of interpersonal avoidance behaviours (Lange & Pauli, 2019). Social avoidance by means of interpersonal distance has also been studied in individuals with psychosis (Brinkman et al., 2011; Geraets et al., 2018). In a non-clinical sample, interpersonal distance has also been used to assess prosocial approach behaviours towards an avatar in distress (Gillath et al., 2008), which could give insights into helping behaviours, also in bullying situations.

3. Intensive repeated measures in naturalistic settings (IRM-NS)

IRM-NS includes both daily diaries and ecological momentary assessment (EMA). Daily diary implies that, usually once a day, at the end of the day, participants report their experiences that occurred throughout the day. To date, a few studies have used daily diaries to examine victims' interpersonal experiences in daily life. Participants self-reported daily occurrences during the last school hour (Morrow et al., 2019), or after school or work (Baillien et al., 2017; Oppenheimer et al., 2020; Pouwels et al., 2016) and during the day on weekends (Oppenheimer et al., 2020). All of these studies assessed occurrences of real-life negative interpersonal situations for up to 20 consecutive weekdays. Most studies specifically assessed real-life interpersonal conflicts, either at school (Morrow et al., 2019; Pouwels et al., 2016) or at work (Baillien et al., 2017), whereas one study examined negative experiences more broadly (e.g., disagreements or being excluded from activities; Oppenheimer et al., 2020). Interpersonal conflicts included physical victimisation, social manipulation, or social rebuff (as in Morrow et al., 2019), or work-related versus person-related conflicts at work (see Baillien et al., 2017). One study also assessed whether the experienced interpersonal conflicts were continuations of previous conflict incidents (i.e., with the same individuals) rather than one-time occurrences (Baillien et al., 2017). Concerning the negative interpersonal situations they reported, participants rated the perpetrators' hostile behaviours towards them (Baillien et al., 2017), their own social competence (Morrow et al., 2019), their subjective interpersonal inferiority (Baillien et al., 2017), as well as internalising problems (Pouwels et al., 2016).

These daily diary studies offer first insights into victims' interpersonal perceptions and affect assessed relatively close in time to actually experienced stressful interpersonal situations, that is, victims' interpersonal characteristics when experiencing real-life bullying (e.g., Morrow et al., 2019), as well as other more general interpersonal conflicts (e.g., Baillien et al., 2017). Of note, studies to date have primarily focused on testing between-person differences in interpersonal characteristics. In fact, we are aware of only one diary study that tested for within-person variations in victims. Specifically, it was examined whether participants' self-perceptions of social competence fluctuated over time depending on their daily interpersonal victimisation experiences (Morrow et al., 2019). The authors indeed found evidence for such within-person fluctuations and that these were related to daily negative peer experiences.

Compared to daily diary studies, EMA studies offer to study individuals' everyday experiences (i.e., real life) assessed even more closely in time (i.e., momentarily), in various everyday contexts (i.e., context-sensitivity) and, importantly, repeatedly throughout the day. These aspects are especially relevant when studying interpersonal functioning because of its context-dependency. For example, in individuals with social anxiety, how (un)friendly the interaction partner is perceived has been found to be positively associated with submissive behavioural responses, suggesting that perceived unfriendliness may cause the high submissiveness often seen in individuals with social anxiety (Sadikaj et al., 2015). Similarly, a victim who behaves very submissively towards their perpetrator may not necessarily behave as submissively in other social contexts. EMA studies offer valuable insights into everyday interpersonal functioning but have yet to be conducted in samples of victims of bullying.

So far, all IRM-NS studies in victims have been daily diary studies. These studies have mainly examined between-person differences in interpersonal functioning. Below, we present various other EMA protocols suitable for also examining within-person variation in interpersonal functioning or the unfolding of interpersonal processes over hours or days or in varying contexts (Moskowitz et al., 2009; Shiffman et al., 2008). This is relevant as interpersonal functioning is known to vary depending on, for example, the relation with the interaction partner or a person's mood, as well as over time (Moskowitz, 2010; Sadikaj et al., 2011, 2017). Studies outside the bullying field have applied signal-contingent and event-contingent protocols which are highly relevant for systematically studying interpersonal characteristics. Below, we showcase both designs by means of studies in the context of depression and various anxiety disorders (for reviews see aan het Rot et al., 2012; Walz et al., 2014).

Signal-contingent recording means that participants are prompted to report on specific variables at semi-random time points during the day (e.g., between 5-7pm and again between 8-10pm). Participants can be signalled by a device (e.g., a programmed watch or incoming text messages) to fill in the EMA questionnaires themselves (e.g., Mor et al., 2010). In other studies, participants are called and EMA questionnaires are completed by the researcher calling (e.g., Tan et al., 2012). Researcher-initiated calling and reporting might be especially useful for children who potentially need more guidance and supervision to comply with the respective EMA protocol (cf. Forbes et al., 2012; Tan et al., 2012).

Event-contingent recording (ECR; Moskowitz, 1994; Moskowitz & Sadikaj, 2014) means that participants are given a predetermined event which serves as a specific prompt to fill in EMA questionnaires whenever the event has occurred. Event-contingent recording of social interactions is particularly useful to study interpersonal functioning. Throughout the day and immediately after participants have had a social interaction, they have to fill in the ECR questionnaire (e.g., Kopala-Sibley et al., 2014; Rappaport et al., 2017; Russell et al., 2011; Zuroff et al., 2007). This way, retrospective bias regarding recalling past events is reduced, both compared to questionnaire studies asking for interpersonal characteristics in, for example, the past four weeks, and also compared to signal-contingent protocols which might have time frames such as “since the last prompt” or only assess data at the end of the day. Another advantage of ECR is that all social interactions are sampled, instead of only interpersonal conflicts as done in the aforementioned daily diary studies previously conducted in victims (e.g., Morrow et al., 2019). This way, a more general picture of victims’ interpersonal functioning can be achieved and interpersonal characteristics can be compared between negative (e.g., being bullied or having an argument) and positive (e.g., getting a compliment or praise) interactions. Additionally, ECR offers to assess a variety of interpersonal characteristics such as behaviours, perceptions, and affect (Moskowitz & Sadikaj, 2014). Overall, ECR is a form of IRM-NS that may be used to study multiple aspects of real-life interpersonal functioning, in various contexts, and very close in time to the events of interest, namely social interactions.

Where to go from here - Recommendations for future research and conclusions

Multiple researchers have recognised the importance of learning about interpersonal functioning in relation to bullying. Social-network studies have been conducted to understand the social standing of individuals within groups and how such group dynamics might explain bullying victimisation (e.g., Hooijsma et al., 2020; Rambaran et al., 2020). In addition, retrospective questionnaire-based studies have established a valuable starting point regarding interpersonal traits of victims, aggregated across time and situations (see Vivolo-Kantor et al., 2014 for a review).

We have argued that examining interpersonal processes in victims can help to better understand not only the risk of victimisation, but also the negative sequelae of being bullied, specifically developing psychopathologies. This requires systematically studying victims’

interpersonal characteristics in order to be able to ultimately draw causal conclusions about the victimisation-interpersonal functioning relation and subsequently about the role of victims' interpersonal functioning in explaining mental health problems. Drawing such conclusions generally requires experimental control and manipulation; something questionnaire-based studies cannot provide but experimental designs and, to some degree, performance-based measures can. In addition IRM-NS studies offer drawing person-level conclusions about victimisation and interpersonal functioning by means of advanced statistical analyses such as lagged or within-person network analyses (e.g., Borsboom et al., 2021; Bringmann et al., 2017)

We have argued for and provided examples of studies using performance-based, experimental designs, or IRM-NS to study interpersonal functioning of victims of bullying more systematically. We believe they represent valuable additions to questionnaire-based research. We are aware that our proposed designs also have limitations. For example, experimental designs have relatively limited external validity, specifically ecological validity, and IRM-NS is time-consuming and often requires complex statistical analyses³. Multi-method study designs would take the knowledge gained from previous retrospective questionnaire studies a step further. This way, we draw from each design's strength and take advantage of the complementarity of the study designs. At the same time, this adds complexity and a large sample.

As presented above, research in the fields of clinical psychology and experimental psychopathology have already applied experimental designs and IRM-NS to study the development of psychopathology. Applying those designs may also be useful to study the role of interpersonal functioning in explaining psychopathology in victims of bullying. In sum, a better understanding of interpersonal processes involved in the onset and recurrence of victimisation may also help to explain negative mental health consequences such as social anxiety and depression.

³ For more information regarding potential limitations of these study designs, we refer the reader to previous publications (e.g., Falk & Heckman, 2009; Shiffman et al., 2008).

Supplementary materials

In the following, we will provide details about the search criteria we applied to identify papers that examined interpersonal functioning of victims of bullying using performance-based or experimental designs, or IRM-NS. For a more extensive overview about the used methods, the population, or the results, please refer to supplementary Table 1.

Search details

We used the following string of search terms within PsycInfo, Medline, and SocIndex: (social OR interpersonal) AND ((bully* AND victim*) OR (peer victim*)) AND (experiment* OR "experience sampling" OR labo* OR "momentary assessment" OR "diary"). The final search date was 28th August 2020 resulting in 283 papers. A list of the 24 papers that were considered relevant can be found in supplementary Table 1.

Participants and assessment of victimisation

All studies included a peer victimised sample, mostly assessed using self-report ($n = 17$) as compared to other-report ($n = 5$), with two studies using both self- and other-report. The majority of studies was based on child or adolescent samples ($n = 23$), whereas only one described findings in adult victims.

Study design overview

Out of the 24 studies, most ($n = 21$) used an experimental design, with 11 applying performance-based measures and 10 experimental tasks manipulating interpersonal functioning. In comparison, only 4 (one of those also applied an experimental task) used an IRM-NS design, more specifically a daily diary design. For more details about the respective study design as well as an overview of relevant results, please see supplementary Table 1.

Supplementary table 1.

Overview of study details and relevant results of studies examining interpersonal functioning of victims of bullying using performance-based or experimental designs, or IRM-NS.

Reference	Measure /task	Population N (% female ^A ; mean age in years (SD))	Bullying victimisation experiences	Interpersonal functioning	Most relevant findings
<u>Performance-based measures</u>					
Breslend et al., 2018	SCI	N _{total/victims} : 119 (100; 12 (1.96))	OR: Relational and physical victimisation ratings by summer camp counsellors using items from the CSEQ-TR.	Anxious rejection sensitivity: six-item/vignettes version of the CRSQ. Autonomic nervous system reactivity to social stress: Skin conductance level and respiratory sinus arrhythmia measured before and after SCI.	Physical but not relational victimisation was positively correlated with anxious rejection sensitivity. Higher levels of relational victimisation were associated with higher levels of anxious rejection sensitivity in girls who had reciprocal sympathetic nervous system activation/increased physiological arousal. This association became non-significant when controlling for physical victimisation experiences.
Murray-Close et al., 2014	SCI	N _{total/victims} : 196 (54; 10 (0.6))	OR: Physical and relational victimization using CSEQ-TR.	Physiological (i.e., blood pressure and skin conductance) reactivity to relational and instrumental stress	Blunted physiological reactivity to relational stress and heightened physiological reactivity to instrumental stress was associated with physical aggression, particularly among youth higher in victimization. In girls, relational aggression was most robustly associated with blunted physiological reactivity to relational stressors, particularly among girls exhibiting higher levels of relational victimization. In boys, relational aggression was associated with heightened physiological reactivity to both types of stressors at higher levels of peer victimization and blunted physiological reactivity to both types of stressors at lower levels of victimization.

Chen et al., 2018	TSST	<p>N_{total}: 80 (45; 11 (0.7)) N_{victims}: 59 (NA) Specifically: N_{physically victimised}: 18 (NA; 11 (0.9)) N_{verbally victimised}: 22 (NA; 11 (0.8)) N_{socially victimised}: 19 (NA; 11 (0.7)) N_{non-bullied}: 21 (NA; 11(0.4))</p>	<p>SR: Six items of the BVQ, time frame last school semester. Three subgroups created, physical, verbal, and relational/social victimisation</p>	<p>Physical stress response by means of cortisol levels in saliva.</p>	<p>Victimised individuals had higher overall cortisol levels compared to non-bullied group. No within-victim group differences (i.e., by type of victimisation). No sign diff. between victims and non-bullied regarding cortisol levels after the TSST (both groups had similar increase).</p>
Giletta et al., 2018	TSST	<p>N_{total/victims}: 157 (100; 15 (1.4))</p>	<p>OR: Close friend-report using the RPEQ</p>	<p>Inflammatory cytokines responses: IL-1β, IL-6, and TNF-α Negative cognitive style: ACSQ</p>	<p>Girls with higher levels of peer victimization showed greater IL-1β and IL-6 cytokine reactivity but not higher TNF-α reactivity to the social stressor. Negative cognitive style did not moderate these relationships. When examining changes in cytokine levels from pre to post, there was no main effect of victim status and also no moderation of negative cognitive style.</p>
Hamilton et al., 2008	TSST	<p>N_{total}: 93 (57; 19 (1.8)) N_{victims}: 54 (56; NA) N_{non-bullied}: 39 (59; NA)</p> <p>Smaller sample for cortisol findings: N_{total}: 71 (51; NA)</p>	<p>SR: EBQ during junior high and high school</p>	<p>Blood pressure (systolic and diastolic, and mean arterial pressure), pulse pressure, heart rate, and cortisol in saliva.</p>	<p>Bullied men showed no change in systolic or diastolic blood pressure or mean arterial pressure over the course of the study (thus no change during or after social stressor) but non-bullied men did (increase during stressor). No significant findings for women of either group for any blood pressure type. No relevant significant findings for pulse pressure, heart rate, or salivary cortisol. When dividing victims into those who still feel anger towards perpetrator and those who do not, anger men had overall higher systolic</p>

		N _{victims} : 42 (48; NA) N _{non-bullied} : 29 (55; NA)			blood pressure and cortisol levels than non-anger men. No sign. effects of time or regarding other measures; no sign. findings for women.
Ouellet-Morin et al., 2011	TSST	N _{total} : 30 monozygotic twin pairs discordant on bullying (NA; 13 (0.5)) N _{victims} : 30 (NA) N _{non-involved} : 30 (NA)	OR: Mother-report, assessing frequency (Has each twin been bullied by another child), chronicity (assessed at age 7, 10, and 12) and severity (Has the twin suffered physical or psychological harm as a consequence of bullying).	Cortisol in saliva	Sign. difference in cortisol response after social stressor. Non-involved individuals had an increase in cortisol (as expected after stressor), victims had not (i.e., a blunted cortisol response).
Monti et al., 2014	SCT	N _{total/victims} : 118 (52; 9 (0.3))	SR: RSEQ to assess daily overt and relational victimisation	Salivary alpha-amylase (sAA) as a marker for autonomic nervous system reactivity (from pre to post stressor)	Overall, more victimisation was not sign. related to sAA reactivity. Only when mothers made few engagement suggestions (compared to many), victimisation was associated with greater sAA reactivity. No moderation effect of the mother's disengagement suggestions, distress responses, or minimising-ownitive responses. More victimisation was sign. associated with more rumination but not with problem solving skills.
Monti et al., 2017	SCT	N _{total/victims} : 130 (51; 9 (0.3))	SR: RSEQ to assess daily overt and relational victimisation	Rumination and problem solving during task rated by watching video after task completion	Victimisation was associated with heightened frustration in response to social stress in girls but not boys with high sAA reactivity.
Rudolph et al., 2010	SCT	N _{total/victims} : 132 (52; 9 (0.3))	SR: RSEQ	Frustration rated by watching video after task completion Cortisol and salivary alpha-amylase (sAA) reactivity after SCT	Peer victimisation was not correlated with cortisol or sAA reactivity Victimisation was associated with depressive symptoms for but not boys with high sAA reactivity.
Rudolph et al., 2011	SCT	N _{total/victims} : 132 (52; 9 (0.3))	SR: RSEQ	Rumination rated by watching video after task completion Cortisol and salivary alpha-amylase (sAA) reactivity after SCT	

Swartz et al., 2019	Emotional face matching task (Swartz et al., 2015)	N _{total/victims} : 49 (49% female 2% binary; 13 (NA))	SR: relational aggression subscale of the PES	Amygdala response after seeing fearful and angry faces.	Amygdala activity to angry faces was not sign. correlated with victimisation, neither was amygdala activation to fearful faces. However, there was a moderation effect of those two. Lower levels of amygdala activity to angry faces predicted lower victimisation when amygdala activity to fearful faces was relatively low.
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Reference	Measure /task	Population N (% female ^A ; mean age in years (SD))	Bullying victimisation experiences	Interpersonal functioning	Most relevant findings
<u>Experimental tasks</u>					
Lansu et al., 2017	Cyberball	N _{total} : 564 (49; 10 (1.04)) No further information by bullying history	SR: "Who in your classroom has bullied you?" OR: Classmate ratings "Who in your classroom is bullied by others?"	Perceived exclusion: SR on whether and how often they felt excluded during cyberball game. Moods: angry, anxious, sad, and happy. Fundamental needs fulfillment: adjusted NTS: belongingness, control, meaningful existence, and self-esteem	For SR victimisation: Children with more victimisation felt more excluded, had higher feelings of anger and sadness, and lower levels of happiness, and reported less belongingness, control, meaningful existence, and self-esteem, disregarding whether or not they were actually excluded. PR victimisation: No sign. findings for perceived exclusion. Overall/disregarding whether they were actually excluded, individuals with more victimisation were sadder and reported lower meaningful existence. Only when actually excluded, higher victimisation was related to more anger and sadness and less happiness, and less experienced belongingness, control, meaningful existence, and self-esteem.

Mazzone et al., 2017	Cyberball	N _{total} : 28 (39; 12 (1.3)) No further information by bullying history	OR: Peer nominations following Pozzoli et al., 2012	Skin temperature variation as an indicator for sympathetic nervous system arousal	Victims had larger skin temperature increase during exclusion compared to bullies.
McIver et al., 2018	Cyberball	N _{total} : 45 (80; 18 (0.6)) N _{victims} : 15 (87; 18 (0.6)) N _{cyberdefenders} : 15 (80; 17 (0.5)) N _{non-involved} : 15 (73; 20 (0.6))	SR: BVQ, last year of high school Cyberdefending in last year of high school using the EBRQ	Neural response/activation as measured by fMRI in the following regions: right precentral gyrus, bilateral inferior parietal lobe (IPL), right angular gyrus, right inferior frontal operculum (rIFO), and right superior frontal gyrus (rSFG), left amygdala, left parahippocampal gyrus (PHG), left inferior frontal operculum (IFO), and right fusiform gyrus	Victims showed a greater neural activation in frontal and parietal regions (i.e., right precentral gyrus, IPL, right angular gyrus, rIFO, rSFG, left amygdala, left PHG, left IFO, and right fusiform gyrus) to social exclusion compared to both non-involved and defender group. There was a dose-response relationship with more severe victimisation being related to more activation in IFO, IPHG, left amygdala, and right fusiform gyrus. During exclusion, victimised girls showed greater activation than non-victimised girls in the dACC, the amygdala, and inferior fusiform gyrus.
Rudolph et al., 2016	Cyberball	N _{total} : 47 (100; NA) N _{chronic-victims} : 24 (100; 15 (0.4)) N _{non-involved} : 23 (100; 15 (0.4))	SR: RSEQ - victimisation across seven years	Neural response/activation as measured by fMRI in the following regions: dorsal anterior cingulate cortex (dACC), the amygdala, and inferior fusiform gyrus	During exclusion, victimised girls showed greater activation than non-victimised girls in the dACC, the amygdala, and inferior fusiform gyrus.
Ruggieri et al., 2013	Cyberball	N _{total} : 58 (59; 12 (1.3)) N _{passive-victims} : 26 (NA) N _{non-involved} : 32 (NA)	SR: BVS – past three months	Mood: four bipolar mood items (good–bad, happy–sad, friendly–unfriendly, relaxed–tense) Need threats: NTS, sense of belonging, self-esteem, sense of meaningful existence, and control	Victims had a lower mood in the exclusion condition compared to non-involved individuals. More generally, after playing the cyberball, victims reported feelings of less belonging and less meaningful existence compared to non-involved peers. The findings for meaningful existence was qualified by condition. In the exclusion but not in the inclusion condition, victims indicated lower feelings of meaningfulness of

Telzer et al., 2018	Cyberball	<p>N_{total}: 46 (100; 15 (0.3)) N_{chronic-victims}: 25 (100; NA) N_{non-involved}: 21 (100; NA)</p>	SR: RSEQ across past seven years	<p>Rejection: NTS Risk taking task in a social context after Cyberball: Adjusted stop light task (Gardner and Steinberg, 2005) Neural reactivity: Brain regions involved in affective sensitivity: the bilateral amygdala, ventral striatum, and orbitofrontal cortex (OFC) Regions involved in social cognition: medial prefrontal cortex (MPFC), temporoparietal junction (TPJ), medial posterior parietal cortex (MPPC), superior temporal sulcus (STS), dorsomedial prefrontal cortex (DMPFC), Regions involved in cognitive control: ventral and dorsal lateral prefrontal cortices (VLPFC, DLPFC)</p>	<p>existence than non-involved individuals. Chronically victimized girls reported feeling significantly more rejected following Cyberball than did non-victimized girls. After exclusion, chronically victimized girls made significantly more risky choices than non-victimized girls.</p> <p>When deciding to make a safe decision, victimized girls showed greater activation in the MPFC, DMPFC, TPJ, MPPC, and STS as well as the VLPFC and DLPFC compared to non-involved girls.</p> <p>When deciding to make a risky decision, victimized girls showed greater reactivity in the bilateral amygdala, ventral striatum, and OFC, as well as the MPFC, TPJ, and MPPC compared to non-involved girls.</p> <p>When adolescents successfully passed through an intersection without crashing following a risky decision, victimized girls showed greater activation than non-victimized girls in the striatum.</p> <p>Victimisation sign. moderated the association between right AI and suicidal ideations. Individuals who had more victimisation experiences (compared to less) had more suicidal ideation when they had high right AI activation after rejection.</p>
Oppenheimer et al., 2020	CIT Also see IRM-NS	N _{total/victims} : 36 (53; 14 (1.5))	SR: Victim subscale of the PRQ	fMRI: neural response to social acceptance and rejection in the following regions: right and left anterior insula (AI) and dorsal anterior cingulate cortex (dACC)	<p>Victimisation sign. moderated the association between right AI and suicidal ideations. Individuals who had more victimisation experiences (compared to less) had more suicidal ideation when they had high right AI activation after rejection.</p>

Dimitroff et al., 2020	Observed social rejection (by “rejecter”) of unknown victim	N _{total} : 83 (59; 20 (1.6)) No further information by bullying history	SR: “Have you ever personally been a victim of bullying at any point in your life?”	Third-party punishment by means of sound-blast	No sign. moderation of victimisation on the association between left AI and suicidal ideation or dACC and suicidal ideation. No difference between victims and non-bullied individuals regarding feeling sorry for the victim and feeling upset with the rejecter. Victims gave louder blasts to the rejecter as compared to the victim. Non-bullied individuals gave similar blasts to rejecter and victim.
Gallup et al., 2010	Sequential Prisoner’s Dilemma (SPD) game	N _{total} : 86 (51; age range 18-23) No further information by bullying history	SR: EBQ - in high school	Offering cooperation, defecting cooperation (non-reciprocation), or punishing a non-reciprocator during SPD.	For men, the tendency to cooperate, reciprocate, or punish was unrelated to past peer victimisation experiences. For women, the tendency to cooperate or punish was unrelated to past peer victimisation experiences. Though, women with higher victimisation experiences were more likely to defect on their partner/ to not reciprocate. Across but also per condition, victims thought that bystanders would help the victim rather than assist the bully. Control beliefs were stronger in victims compared to non-involved individuals. Victims showed no difference regarding the two types of normative beliefs or compared to non-involved individuals.
Leung et al., 2018	Witnessing of a hypothetical bullying scenario on a social media platform where the victim was either defended (condition 1) or offended (condition 2)	N _{total} : 203 (65; 17 (3.3)) N _{cybervictims} : 49 (NA) N _{cyber bully-victims} : 64 (NA) N _{cyberbullies} : 25 (NA) N _{non-involved} : 65 (NA)	SR: cyberbullying based on Leung et al. (2018)	Control beliefs about bystanders potentially assisting the bully or helping the victim Normative beliefs about bystanders assisting the bully or helping the victim	Across but also per condition, victims thought that bystanders would help the victim rather than assist the bully. Control beliefs were stronger in victims compared to non-involved individuals. Victims showed no difference regarding the two types of normative beliefs or compared to non-involved individuals.

Reference	Measure /task	Population N (% female ^A ; mean age in years (SD))	Bullying victimisation experiences	Interpersonal functioning	Most relevant findings
IRM-NS					
Baillien et al., 2017	Daily diary: Two times event-based diary for 20 working days. Filled in once after work.	N _{total} : 109 (NA) N _{victims} : 47 (70; 46 (8.7)) N _{non-bullied} : 62 (62; 39 (7.9))	SR: 1) Do you regard yourself as a victim, 2) Were you bullied during study period, and 3) Have you been bullied in the past	If a workplace conflict had occurred during the day, questions were answered regarding: Work-related neg. social behaviour against them Person-related neg. social behaviour against them Overall neg. social behaviour: yes to either of the two or both	Victims reported twice as much conflicts with colleagues, supervisors and subordinates compared to non-bullied group. And 45% of victims' conflicts were workplace bullying (as compared to interpersonal conflicts), whereas non-bullied reported 10% as workplace bullying incidents. No group differences for conflicts outside work (e.g., with family, relatives, friends). Victims experienced more work-related and person-related negative social behaviours towards them than non-bullied individuals. Victims felt more inferior in conflicts and less in control, reported more continuation of previous conflicts, perceived other's intention as more malicious, and the development of conflict incidents as intentional than non-bullied.
Morrow et al., 2019	Daily diary once a day at the end of the school day for on average 8 school days.	N _{total/victims} : 182 (42; 11 (0.7))	SR: Daily peer victimisation using the CSTPV: five types: physical, verbal, social manipulation, social rebuff (e.g., a person refused to talk to me), and property attacks	Daily perceived social competence with adjusted version of the Social Competence subscale of the SPPC	When tested separately, verbal, social manipulation, social rebuff, and property attacks but not physical victimisation sign. predicted a decrease in daily perceived social competence. When tested together, only the negative association between social rebuff victimisation and daily perceived social competence remained significant.

Oppenheimer et al., 2020	Daily diary: Calls after school hours or on weekenddays assessing most negative affect in response to a self-nominated event that occurred within past hour.	N _{total/victims} : 36 (53; 14 (1.5))	SR: Victim subscale of PRQ	fMRI: neural response to social acceptance and rejection in the following regions: right and left anterior insula (AI) and dorsal anterior cingulate cortex (dACC)	Daily negative social experiences sign. moderated the association between right AI activation and suicidal ideation but did not sign. moderate the association between left AI or dACC and suicidal ideation. Victimization experiences were not included in analyses, only as part of experimental rejection (see experimental designs).
	Also see experimental designs				
Pouwels et al., 2016	Daily diary: online questionnaire at the end of five consecutive school days	N _{total} : 188 (58; 16 (0.8)) N _{SR-victims} : 25 (NA) N _{PR-victims} : 28 (NA)	SR: BVQ in past school year OR: peer-reports Daily self-reported victimisation	Daily internalising affect	Both self- and peer-reported victimisation was associated with more daily internalising affect. Too few daily victimisation incidences for statistical analyses.

Note. ^A = if not else indicated, gender was assessed using binary categories. N_{total/victims} = Total sample size equals sample size of victims, as bullying victimisation was treated as a continuous variable. SCI = Social Competence Interview (Murray-Close et al., 2014). TSST = Trier Social Stress Test (Kirschbaum et al., 1993). SCT = Social Challenge Task (Rudolph et al., 2009). Cyberball = (Williams et al., 2000). CIT = Chatroom Interact Task (Silk et al., 2014). SR = self-report; OR = other-report. If no time phrame is indicated, bullying victimisation refers to experiences at the time of data collection. CSEQ-TR = Children's Social Experiences Questionnaire-Teacher Report (Cullerton-Sen & Crick, 2005). BVQ = Olweus Bully-Victim Questionnaire (Olweus, 1994, 1996). RPEQ = Revised Peer Experiences Questionnaire (Prinstein et al., 2001). EBQ = Experiences with Bullying Questionnaire (Newman et al., 2005). RSEQ = Revised Social Experiences Questionnaire (Crick & Grotpeter, 1996). PES = Peer Experiences Scale (Prinstein et al., 2001). EBRQ = Electronic Bullying Roles (Edge, 2014). BVS = bully-victim scale (Alsaker et al., 2008). PRQ = Peer Relations Questionnaire (Rigby & Slee, 1993). CSTPV Comprehensive Scales of Traditional Peer Victimization (Morrow et al., 2014). CRSQ = Children's Rejection Sensitivity Questionnaire (Downey et al., 1998). ACSQ Adolescent Cognitive Style Questionnaire (Hankin & Abramson, 2002). NTS = Need Threat Scale (Van Beest & Williams, 2006). fMRI = functional Magnetic resonance imaging. SPPC = Self-Perception Profile for Children (Harter, 1985).

