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So you want to study bullying? Recommendations to enhance the validity, transparency, and compatibility of bullying research

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Abstract

Bullying is a serious problem that affects millions of individuals worldwide each year. In response to this, thousands of research articles have been published on bullying. Unfortunately, much of bullying research remains largely atheoretical in its approach to defining bullying as a unique form of aggression. Another key problem in bullying research is the proliferation of heterogeneity of bullying measures whose validity is sometimes questionable. Combined, these two problems have made progress difficult as comparisons between studies and results are impeded by a lack of commonality. As a solution to these problems a discussion of the issues surrounding defining and measuring bullying is offered. This paper aims to promote thoughts and insights about the critical issues and concepts facing those who seek to define and measure bullying for research, intervention, or policy work. Although suggestions for best practices are offered, the overriding goal is to promote all practices that enhance the validity, transparency, and compatibility of bullying research. The time seems right for a general call to action for researchers to individually produce data that are both theoretically and empirically more communicable to the broader bullying community.

Keywords: Bullying; Measurement; Definition; Validity; Theory; Transparency

So You Want to Study Bullying? Recommendations to Enhance the Validity, Transparency, and
Compatibility of Bullying Research

1. Introduction

Bullying is a serious topic that has generated steadily increased attention from governments and the general public (Hymel & Swearer, 2015). It affects millions of people each year across virtually all known cultures and social domains, including schools, family homes, recreational activities, work, and prisons (Monks et al., 2009; Volk, Camilleri, Dane, & Marini, 2012; Volk & Lagzdins, 2009). As a result, bullying research has increased exponentially in the last decades. PsycINFO lists 27 peer-reviewed journal articles in response to a search of bully* in the first 80 years of the 20th century, 29 in the 1980s, 275 in the 1990s, and 1,898 in the first decade of the new millennium. This exponential trend has continued, with over 5,000 peer-reviewed articles on bullying being published in the preceding six years (PsycINFO, February, 2017). By any standard then, bullying is an important, global, phenomenon that has generated strong and growing interest amongst researchers.

In large part, this is because of growing evidence that there are significant long-term adverse outcomes for victims (e.g., Copeland, Wolke, Angold, & Costello, 2013; Copeland et al., 2014; Kretschmer et al., 2017; Wolke, Copeland, Angold, & Costello, 2013) and to a lesser extent bullies (Bender & Lösel, 2011; Kretschmer et al. 2017; Ttofi, Farrington, Lösel, & Loeber, 2011). In response to this evidence, researchers have attempted to identify the causes of bullying to develop intervention programs that target the risk and protective factors associated with bullying involvement (Iudici & Faccio, 2014; Olweus, 1993; Rigby, 2010; Ttofi & Farrington, 2011). Thus, bullying remains a challenging behavior to study adequately. This is due in part to the very nature of bullying as a behavior that aims to avoid detection and sanctions

from authority figures, meaning that it is often deliberately hidden or misrepresented (e.g., Craig & Pepler, 1998). Beyond this concealment, bullying is a complex behavior that often requires an intimate understanding of the social dynamics of youth, peer groups, and schools to properly observe and interpret the behaviors and outcomes (Rodkin, Espelage, & Hanish, 2015; Salmivalli, 2010; Sutton, Smith, & Swettenham, 1999).

There are many challenges to conducting research on bullying, including many different ways of defining (e.g., Nansel & Overpeck, 2003; Vaillancourt et al., 2008) and measuring bullying (e.g., Casper, Meter, & Card, 2015; Hamburger, Basile, & Vivolo, 2011). This heterogeneity in methods and definitions is not new (Arora, 1996). In fact, over two decades have passed but still bullying research is in need of more clarity regarding defining and measuring bullying (Bradshaw, 2015; Green et al., 2013; Griffin & Gross, 2004; Hawley, Stump, & Ratliff, 2011; Swearer, Siebecker, Johnsen-Frerichs, & Wang, 2010). This need for more definitional and measurement clarity is also apparent in applied/intervention research (Ryan & Smith, 2009). When combined with the increasing proliferation of bullying research, a strength of the field (its growing size and heterogeneity) poses a risk of making it drift apart instead of approaching consensus on important issues.

We, therefore, offer a discussion of some of the key issues, along with a series of recommendations to help researchers standardize and clarify their bullying research and interventions in an effort to promote greater reliability and validity of measures in the field. Our efforts are aimed primarily at studying bullying in children and adolescents, but the general principles may also apply to adult or preschool populations. Further, while aimed primarily at researchers and interventionists, our discussion may also be valuable for educators, policy makers, and members of the general public. Although we offer our own best practice

recommendations, we are chiefly interested in promoting all practices that increase the validity, transparency, and compatibility of bullying research. Overall, we place a strong emphasis on the importance of grounding research and interventions within theoretical frameworks that facilitate methodological choices and across-study comparisons.

2. Defining Bullying

To begin with, bullying is a difficult behavior to define (Gladden, Vivolo-Kantor, Hamburger, & Lumpkin, 2014; Thornberg, 2015). The modal definition of bullying was provided by Dan Olweus in 1993 (pp.8-9): “it is aggressive behavior or intentional ‘harm doing,’ which is carried out repeatedly and over time in an interpersonal relationship characterized by an imbalance of power.” This definition highlights three main features: intentional aggression, repetition, and an imbalance of power. Although cited thousands of times, this definition is not without problems. On the applied level, it is not clear that participants use the core elements of this definition when answering questions about bullying (e.g., they omit power, harm, repetition, and/or intentionality; Bazelon, 2013; Green et al., 2013; Hellström, Persson, & Hagquist, 2015; Oldenburg, Bosman, & Veenstra, 2016; Vaillancourt et al., 2008). A lack of agreement with participants represents a challenge to the validity of any definition (deLara, 2012). It also appears that researchers do not always assess all three aspects of this definition, leading to data that relates more to general aggression (any harmful behavior) than to bullying (Bradshaw, 2015; Finkelhor, Turner, & Hamby, 2012; Hawley et al., 2011). There are also theoretical concerns with this definition that were born out of practical observations without any serious theoretical examination of potential limits on its validity and/or compatibility with existing bodies of research (Grief & Furlong, 2006; Olweus, 1993; see below for a discussion of some of these theoretical issues). These problems have led researchers to explore numerous alternative

definitions of bullying (Arora, 1996; Corcoran, Guckin, & Prentice, 2015; Cowie, Naylor, Rivers, Smith, & Pereira, 2002; Gladden et al., 2014; Monks et al., 2009; Sercombe & Donnelly, 2013).

Recently, Volk, Dane, and Marini (2014) defined bullying as “*aggressive, goal-directed behavior that harms another individual within the context of a power imbalance.*” This new definition addresses three theoretical issues. First, it removes the generally difficult to measure criterion of intentionality (Bauman, Underwood, & Card, 2013; Sercombe & Donnelly, 2013) and replaces it with concrete goals that are both easier to measure and predict important measurable outcomes (Ellis, Volk, Gonzalez, & Embry, 2016; Marini & Volk, 2017).

Evolutionary theory suggests that individuals bully for resources, reproductive opportunities, or a social reputation that facilitates obtaining the first two goals (Volk et al., 2012; 2014). The latter goal is closely related to, but potentially distinct from, the dominance and popularity goals that bullying is often associated with. A focus on goals also helps tease apart the proximate goals of bullying (e.g., getting peers to laugh, looking cool, showing off, cutting-off reflected failure, basking in reflected glory) from the ultimate goals of bullying (e.g., getting the best field to play in at recess or having more sexual partners). It also addresses the apparent paradox of why a bully would pick on a much weaker individual in order to gain social status. The victim represents an effective cost-benefit means of sending a signal about the perpetrators’ willingness to use aggression to obtain or maintain high social status (Volk et al., 2014). This is supported by evidence showing that while the number of victims per bully remains generally stable over time, bullies appear to continually select new victims with which they can display their dominance (Van der Ploeg, Steglich, & Veenstra, 2017).

A goal-oriented focus highlights that whereas bullying is often proactive (Sijtsema, Veenstra, Lindenberg, & Salmivalli, 2009), proactive/reactive labels may not necessarily be the most suitable for describing bullying. If one's goal is to obtain a reputation for being violent in the face of social threats, then it may well serve that goal to proactively bully weaker individuals to maintain the credibility of one's threatening reputation. However, that same reputation can also be served by planned reactive aggression toward perceived or potential challenges to one's reputation (Frey, Pearson, & Cohen, 2015). The critical distinction is that bullies strategically use aggression in the context of a power imbalance to obtain their desired goals (Reijntjes et al., 2013; Veenstra, Lindenberg, Munniksmma, & Dijkstra, 2010). Overall then, a focus on goals instead of general intentionality helps researchers to avoid inconsistencies surrounding proactive/reactive aggression, to identify important outcomes of bullying, and to circumvent messy issues surrounding the measurement of intentionality.

Second, Volk et al.'s definition (2014) recognizes that harm is a perception of the victim that relates to both the frequency and intensity of the bullying behavior. A single heinous act of aggression may suffice to permanently alter the psychology and behavior of a victim (e.g., Parker, 2012), whereas repeated acts of very low intensity (e.g., several hundred brief prank calls) may equally cause significant harm. Thus, a victim's experience of harm is the product of frequency by intensity by individual resiliency (Volk et al., 2014). In support of this, recent findings indicate that repetition, severity, and the presence of a power imbalance amplify the perceived harm of an action (Van der Ploeg, Steglich, Salmivalli, & Veenstra, 2015; Van Noorden, Bukowski, Haselager, Lansu, & Cillessen, 2016; Ybarra, Espelage, & Mitchell, 2014). This also means that the same act performed at the same frequency may cause different harm to different individuals based on numerous different individual and environmental ecological

factors (e.g., Barboza et al., 2009; Flaspohler, Elfstrom, Vanderzee, Sink, & Birchmeier, 2009; Hong & Espelage, 2012; van der Ploeg et al., 2015; Vitoroulis & Vaillancourt, 2014). Olweus (1993) alluded to single-incident harmful episodes of bullying, but chose to use frequency as a convenient filter for trivial harm. The aforementioned theory and data, however, suggest that frequency is not a necessary criterion for bullying. What's more, we do not recommend a single definition of what is specifically harmful. Rather, we argue that victim harm is a complex ecological outcome that traditional definitions of bullying often fail to address by virtue of their inability to identify the goals of bullying behaviors. We suggest that a lot of research underestimates or misses important consequences outside of mental and physical health such as access to resources or mating partners.

Finally, Volk et al.'s (2014) definition situates bullying within the broader literature on aggression. Bullying is a specific form of aggression that involves a power imbalance. A power imbalance is perhaps the feature that differentiates bullying from other forms of aggression. It is well established that a physical power imbalance greatly alters the odds of success of physical competitions (Khosla, 1968). Research shows that a power imbalance leads to more severe outcomes for victims of bullying (Hunter, Boyle, & Warden, 2007; Ybarra et al., 2014). More powerful bullies also appear to be less susceptible to anti-bullying interventions (Garandeanu, Lee, & Salmivalli, 2014a). It also appears that being socially dominant leads to future bullying (Van der Ploeg et al., 2017), as do more unequal dominance hierarchies (Garandeanu, Lee, & Salmivalli, 2014b). The presence of a power imbalance further suggests two important adaptive features that are unique to bullying. First, the costs of retaliation born by the aggressor are likely to be low for bullying as compared to other forms of aggression because the bullying victim's lack of power hinders their ability to mount an effective response against their aggressor

(Veenstra, Verlinden, Huitsing, Verhulst, & Tiemeier, 2013). Second, bullying is associated with contrasting social responses. On the one hand, it is likely to be perceived by some onlookers as more negative than other forms of aggression as humans have a general tendency to rally around underdogs and to promote social equality amongst others (Gavrilets, 2012). This may help explain the tendency for some bystanders to intervene in bullying even when there is no immediate benefit for them doing so (Cappadocia, Pepler, Cummings, & Craig, 2012; Polanin, Espelage, & Pigott, 2012). On the other hand, people tend to show a strong tendency to associate themselves with powerful, successful individuals who can directly, or indirectly, help them obtain their own goals (End, Dietz-Uhler, Harrick, & Jacquemotte, 2002; Fodor & Smith, 1982). This is reflected in both the successful popularity, sexual, and resource gains made by bullies (Reijntjes et al., 2013; Turnbull, 1972; Volk, Dane, Marini, & Vaillancourt, 2015) and the willingness of some onlookers to assist the bully rather than defend the victim (Salmivalli, Lagerspetz, Björkqvist, Österman, & Kaukiainen, 1996). An emphasis on power therefore helps preserve some of the unique individual and social features of bullying that are important for both research and interventions. It is worth noting that a power imbalance can take a wide variety of forms, depending on individual, temporal, and/or ecological factors (Volk et al., 2014). The use of qualitative data may help reveal specific forms and degrees of power within various relationships, such as bullying within friendships (Mishna, 2004; Mishna, Wiener, & Pepler, 2008). Thus, while researchers should be cognizant that measuring power may not always be as easy or straightforward as measuring overall popularity or physical strength, the presence of a power imbalance is the feature that should be acknowledged and then measured and validated.

One potential caveat to Volk et al.'s definition is the issue of bully-victims. If bullying is defined as goal-directed aggressive behavior against a weaker target, how well does this fit with

individuals who are both bullies and victims? Research shows that unlike the adaptive benefits associated with “pure” bullies (who represent about 80-90% of bullies), bully-victims (10-20% of bullies) are more likely to report lower popularity, lower social competence, and greater physical and mental risks (Marini, Dane, Bosacki, & YLC-CURA, 2006; Veenstra et al., 2005; Volk et al., 2006; 2012; Wolke et al., 2013). Drawing in part on suggestions from Volk and colleagues (2014) we offer several ideas for how bully-victims may fit within the context of their definition. First, bully-victims may lack the necessary resources (e.g., popularity, strength, self-control, or well-being) to parlay a power advantage into adaptive outcomes. Thus, they are trying to imitate a successful behavior but are not capable of doing so themselves (e.g., because they impulsively choose poor targets). Second, their behavior might not be bullying at all, it could be a form of displaced aggression against weaker individuals instead of their own tormentors. This would potentially be goal-oriented (relieving frustration), but it might not be adaptive. Or perhaps it is defensive in nature and reduces the levels of bullying that they would otherwise receive. We are, however, not aware of data in direct support of either goal. In contrast, if a bully-victim were to retaliate impulsively and ineffectually against a stronger bully, this behavior would certainly be classified as reactive aggression rather than bullying. Bully-victims do in fact display higher levels of reactive aggression, and thus their aggressive actions may be more impulsive, defensive, and emotional-directed rather than goal-directed (Salmivalli, 2010; Schwartz, Proctor, & Chien, 2001; Volk et al., 2014). For that reason, it has been suggested to relabel most bully-victims as aggressive-victims, suggesting that they are in fact not bullies (Schwartz et al., 2001). Thus, bully-victims pose some challenges with respect to their fit to broader definitions of bullying. This only highlights the need for ongoing research aimed at theorizing and testing the definitions of bullying.

To summarize, Volk et al.'s (2014) definition of bullying is a theoretically-grounded definition that clearly identifies the goals of bullying, the range of harm caused by bullying, and the importance of a power imbalance. It is a transdisciplinary definition that can be applied within and outside of academia (Marini & Volk, 2017). However, we encourage ongoing investigations into this new definition of bullying. These investigations should ideally include input from the stakeholders (referring to those who are involved in the bullying and/or victimization; deLara, 2012). Other definitions of bullying may also be viable choices for researchers to use, so we recommend that researchers make an informed choice about which definition they prefer and then explicitly state what they consider to be bullying before deciding to measure bullying. This may include grounded theory procedures that rely on participant-driven, bottom-up approaches (Mishna, Saini, & Solomon, 2009; Thornberg, 2011). The overall goal is to increase the validity, theoretical transparency, and commonality of bullying research by theoretically clarifying what bullying is and is not.

Logic models

To further clarify the theory underlying one's study of bullying, we recommend the use of explicit logic models. Logic models are typically visual representations of the theoretically expected causal connections between the variables of interest. What logic models provide is the requisite that researchers carefully and deliberately outline the theoretical links behind their proposed research or intervention. Particularly in behaviors as complex as bullying, logic models often focus solely on the specific variables discussed within the study or intervention (Pack, White, Raczynski, & Wang, 2011; Smith, Ryan, & Cousins, 2007). This explicit focus clarifies not only what a study is measuring, but also what it is *not* measuring. The latter helps researchers both avoid over-extension as well as identify important avenues for subsequent study.

An explicit statement of the logic and causal mechanisms is not a novel suggestion for science in general (Renger & Titcomb, 2002). The observation that many bullying research articles, however, fail to explicitly define the behavior and the theoretical causal links associated with it highlights the importance of encouraging the use of explicit logic models. Within research, logic models can help clarify and focus published papers (Salin, 2003) as well as better guide a priori research questions and methods.

As one of the first, KiVa researchers offer a logic model explaining how their antibullying program is anticipated to have effects at two different levels: student and classroom (see Figure 1). Their logic model clearly indicates that student level changes are hypothesized to directly influence bullying behavior (e.g., by altering bully's empathy toward victims), but there is no direct path from student level intervention and reductions in victimization. Victimization reductions are expected from classroom level interventions that alter peer attitudes in favor of peer interventions that reduce bullying which in turn reduces victimization. These are both testable pathways that receive empirical support from their data (Saarento, Boulton, & Salmivalli, 2015). This theoretical clarity improves the validity of the literature by clearly testing (and thereby falsifying) specific hypotheses and theories.

3. Measuring Bullying

Having a valid definition accompanied by a clear logic model offers a firm base from which researchers can measure bullying, but measurement is still the Achilles' heel of bullying research: the measurement of bullying does not often map onto the definition employed (Cornell, Sheras, & Cole, 2006). Researchers have used such a wide range of different measures of bullying that there exist some concerns about the validity of findings across different studies (Cornell & Bandyopandhyay, 2010). The ability of research to accurately measure bullying is a

crucial step for advancing research (Hymel & Swearer, 2015), evaluating interventions (Casper et al., 2015; Smith et al., 2007), and implementing legal policies (Cornell & Limber, 2015). In general, whereas bullying research has done a reasonably good job of recording the reliability of its measures (see Casper et al., 2015), it has not strongly focused on the theoretical validity of its measures. Casper et al. (2015, p. 356) suggest that efforts in bullying research “have likely sacrificed validity in the pursuit of reliability.” This leaves the bullying research in the precarious position of having data whose reliability is generally good, but whose validity may be questionable. When added to concerns about the validity of some definitions of bullying, this represents a real threat to the overall validity of bullying research.

To address the problem of accurately measuring their chosen definition, researchers must capture their definitional components with their measures. Whereas numerous studies simply ask individuals to report “bullying”, research has shown that general perceptions of bullying rarely map on to academic definitions of bullying (Bazelon, 2013; Hellström et al., 2015; Oldenburg et al., 2016). In order to minimize participant-researcher differences in the definition of bullying, we recommend researchers to be aware of the validity of their definition with respect to their target sample (deLara, 2012). We then suggest that researchers explicitly and clearly present their definition of bullying to their participants (as in the Olweus BVQ; Green et al., 2013), that they measure behaviors that are themselves explicitly associated with their chosen definition of bullying (e.g., Book, Volk, & Hosker, 2012), and/or that they conduct bottom-up research and present the definition used by their participants (deLara, 2012). Although these three measurement methods are typically similar to each other, the associations are only modest and thus the choice of how to capture all the elements of one’s definition can potentially influence one’s results (Vaillancourt et al., 2008).

The issue is further complicated by having to choose between measuring bullying as an overall behavior or focusing on specific subtypes, forms, or modes of bullying. The latter may include physical, verbal, social/indirect, racial, sexual, cyber, and resource-oriented bullying that each can differ in their predictors and outcomes (Gladden et al., 2014; Salmivalli, Kärnä, & Poskiparta, 2011; Swearer, Turner, Givens, & Pollack, 2008; Volk et al., 2006; Wang, Iannotti, & Nansel, 2009). It is therefore imperative for researchers to be aware of how they are measuring bullying and how their chosen measure fits with other methods of measuring bullying or other measured aspects of bullying. For example, researchers interested in studying the adaptive nature of bullying might find different results when analyzing physical versus indirect social aggression in older adolescents as the former tends to be rarer and less adaptive with increasing age (Volk et al., 2014). Similarly, the Center for Disease Control (CDC)'s recommendations for studying bullying suggest that individual forms of bullying may require different methods (Gladden et al., 2014). For example, their report noted that each form should be clearly delineated with examples (e.g., punching, hitting, etc. for physical), that some forms (e.g., relational) may overlap with other forms, that some forms may be more problematic with respect to definitions (e.g., measuring power in cyberbullying), and that some observers may underestimate the various forms by virtue of not being a witness to them (Gladden et al., 2014). We recommend researchers explicitly clarify the link between what they are trying to measure (their definition and logic model) and how they are measuring it (their items to measure general or specific forms of bullying) in order to improve the transparency and connectivity (referring to validity) of their research.

Choice of Reporter (Peer vs. Self-Report). A major measurement consideration is therefore the choice of reporter. To avoid single-source biases, peers, parents, participants,

teachers, and observers have all been used to investigate bullying. Research has shown that interested adults (e.g., teachers) can explain unique variance in outcomes or processes related to students' aggression or bullying (Ladd & Kochenderfer-Ladd, 2002; Pellegrini & Bartini, 2000). However, we recommend some caution in relying on these reports as teachers and parents can be relatively poor sources of data on individual episodes of bullying given that they sometimes already fail to observe overt acts of bullying (Craig & Pepler, 1998; Gladden et al., 2014) or they may have to rely on second-hand information from adolescents who are possibly biased or withholding information (e.g., Fekkes, Pijpers, & Verloove-Vanhorick, 2005; Oldenburg et al., 2015, 2016). This does not invalidate these choices of reporters, particularly if they are supported by one's logic model (e.g., using teacher reports in a study of school atmosphere and teacher interventions). Rather, as with all methods, we urge researchers to consider how well their methods (in this case, choice of reporter) fit with their proposed hypotheses.

In general then, bullying researchers have tested hypotheses about those who are involved with bullying by using data from those who are closer to the action by using self- and peer-reports. There is a long running debate in the bullying literature about the utility of self-report versus peer data. Whereas there are generally positive correlations between these two sources (Pellegrini & Bartini, 2000), the agreement between the two is not always very high (Lee & Cornell, 2009) but they are each more effective at measuring particular characteristics.

Self-report methods have been most notably promoted by Olweus (2010; 2013), who claims that an individual is in the best position for accurately noting whether harm and a power imbalance were truly present during the bullying episode. He argues that the often secretive and personal nature of bullying means that outsiders (e.g., peers) may miss or misinterpret bullying episodes. As noted in our discussion of the definition of bullying, it is reasonable to presume that

some forms of bullying are intended to be hidden from peers (Volk et al., 2014), making them unobservable by peers. Self-report is also likely to excel at, for example, reporting personal goals and an individual's perception of power imbalances (Bouman et al., 2012; Hawker & Boulton, 2000; Olweus 2013; Sijtsema et al., 2009; Volk et al., 2015). Self-reports of bullying have generally demonstrated modest to good validity with regard to theoretical constructs (Book et al., 2012; Espelage, Holt, & Henkel, 2003; Olweus, 2013; Volk et al., 2006; but see Lee & Cornell, 2009).

As with any report, self-reports can potentially suffer from bias . Bullying is widely regarded as antisocial behavior, so there can be problems with socially desirable responses (Rigby & Johnson, 2006). Another issue is the possibility of shared method variance influencing the results, referring to spurious variance that is attributable to the measurement method, rather than to the constructs the measures are assumed to represent. These biases are more likely to occur when researchers use only one reporting method instead of multiple reporting methods (Bouman et al., 2012; Cornell & Bandyopadhyay, 2010). Furthermore, a general self-serving bias may cause individuals to misattribute the successes and failures they experience in social situations (Graham, & Juvonen, 1998; Shepperd, Malone, & Sweeny, 2008) and to perceive bullying situations differently (Veenstra et al., 2007).

In contrast, peer reports avoid many of these issues by relying on judgements from other individuals who are not as likely to be affected by self-serving or socially desirable biased responses. Peers are also likely to be more effective in accurately measuring an individual's social standing and to provide valid data to examine peer influence processes as they capture the reaction of the social group as a whole, rather than individual perceptions of the social group (Bouman et al., 2012; Huitsing, Veenstra, Sainio, & Salmivalli, 2012; Mouttapa, Valente,

Gallaher, Rohrbach, & Unger, 2004). Peers are crucial for measuring social processes such as bystander involvement in bullying episodes (Salmivalli, 2010; Salmivalli, Voeten, & Poskiparta, 2011). They are also valuable in measuring group levels of conflict (Dijkstra, Lindenberg, & Veenstra, 2008; Huitsing & Veenstra, 2012). Peer reports are deemed to be central to intervention efforts that view bullying as a group process that requires alterations of the social structure (e.g., KiVa; Huitsing & Veenstra, 2012; Yang, & Salmivalli, 2015).

A significant source of concern over using peer reports are biases related to reputational effects, prejudice, or non-bullying relationship problems (Hymel, Wagner, & Butler, 1990). Another potential problem is whether peers observe the bullying in question. A frequently cited statistic in the literature is that peers are present for 85-88% of bullying episodes (e.g., Dake, Price, & Telljohann, 2003). However, the original research states that peers were present for 85-88% of *observed* bullying incidents (Craig & Pepler, 1998; Hawkins, Pepler, & Craig, 2001). Bullying incidents that were hidden from the observers (e.g., in bathrooms, outside of school, or simply well-disguised incidents such as anonymous cyberbullying) are not available for peers to witness first hand. Thus, peer reports will almost certainly fail to capture all bullying incidents. At a minimum, observational data suggests a 15% failure rate, but it could be higher depending on how much bullying is hidden from peers (Berger & Rodkin, 2009). This is currently an “unknown unknown” quantity, but one that might greatly impact the validity of studies of bullying that are (in theory at least) hypothesized to be hidden (e.g., academic subterfuge; Chadaga, Villines, & Krikorian, 2016; Flanagan, 2008; Maestripieri, 2012).

Given the relative strengths of these two approaches, we join numerous previous calls for using both whenever appropriate and possible (Bouman et al., 2012; Casper et al., 2015; Hymel & Swearer, 2015; Lee & Cornell, 2010; Pellegrini & Bartini, 2000; Smith, 2004). The use of the

two forms of report can offset their weaknesses while combining their strengths. Research (Graham & Juvonen, 1998; Perry, Kusel, & Perry, 1988) shows that response bias leads to some victims being identified both by self- and peer-reports but others are identified through only self-reports or only peer-reports. This combination of two sources of data, also known as the “principle of aggregation”, holds the potential for producing data that offer more breadth, reliability, and construct validity (Rushton, Brainer, & Pressley, 1983). From a theoretical perspective, researchers should use their logic models as guides to which source(s) are likely to be most useful in testing their specific hypotheses (e.g., peer report for popularity; self-report for private dyads; both for a study of likeability and bullying goals).

Social Network Data

Increasingly, researchers are collecting rich data on relations between children and adolescents through network questions (Veenstra, Dijkstra, Steglich, & Van Zalk, 2013; even from 6-years on: Verlinden et al., 2014). If children report that they are victimized they can be presented with a roster showing the names of all their classmates, and asked “Who starts the bullying when you are victimized?” An example of a typical bullying network is given in Figure 2, with arrows representing a nomination pathway (the arrows lead from the victim and point to the bully). Figure 2 is a simulated network (simulations were performed in PNet, with 22 students, a fixed density of 5.7%, and parameter values that are given in Table 5 of Huitsing, Van Duijn, et al., 2012). In this network, it can be seen that there is variation in the number of nominations (arrows) children receive for bullying. Some children are quite central in the network, meaning that they receive more nominations as initiators of bullying than others (see also Huitsing, Veenstra, et al., 2012). For example, child 10 is mentioned by five classmates as their bully, child 13 by four peers, and children 8 and 18 by three classmates. Many others are

not nominated. The bullying network is further characterized by children who are reported as bullies but do not report being victimized themselves. Children 3, 8, 10, 13, 14, 16, 18, and 21 have incoming ties but do not nominate others for bullying them. In Figure 2, it can also be seen that seven children are uninvolved; they do not nominate others for bullying nor are reported by others as initiators of bullying. Thus, they are neither bullies nor victims. In addition, some children are mentioned as bullies as well as reporting being victimized themselves. For example, children 12 and 17 have both incoming and outgoing ties. Such network analyses not only provide insights into processes underlying bullying, assisting, or defending, but can also be used to inform teachers about the group structure of their classroom, to give personal advice on their students' relationships, and to make a tailored plan to assist or intervene with those relationships.

They also provide an additional level of information by revealing social structure variables that are hidden within standard self- and peer-reports (Lodder, Scholte, Cillessen, & Giletta, 2015; Sentse, Dijkstra, Salmivalli, & Cillessen, 2013; Turanovic & Young, 2016). For example, do bullies or victims group together because they initially share characteristics (a selection effect) or because their behaviors cause a behavioral convergence over time (an influence effect)? These are questions that can be overlooked by traditional analyses but revealed by social network analyses that can highlight the influence and direction of causal social factors (Espelage et al., 2003; Veenstra et al., 2013). In the case of hypotheses relating to social structures, network analyses may be the preferred method of choice for quantitative researchers (see Forsberg & Thornberg, 2016 for a qualitative perspective). For example, if a researcher wishes to examine whether individuals who bully the same targets become friends, or whether it is in fact that friends start to bully the same persons over time, the research will require longitudinal social network analyses to adequately test these contrasting hypotheses.

Finally, network data are based on self-reports of children about their relationships with others, but can also be aggregated to create peer reports. For example, the network question “Who starts the bullying when you are victimized?” provides information on bullying from the perspective of the victims, but the proportion of nominations children receive for this question leads to a peer report on bullying. In the same way, the network question “Who do you bully?” provides information on bullying from the perspective of the bullies and the proportion of nominations children receive for this question leads to a peer report on victimization. Network data can also be biased, as individuals can make comparable errors as in self- or peer-report data where they misremember or mischaracterize relationships within a network (Knoke & Yang, 2008). Fortunately, in many cases researchers can look for consistent relationships within a network to resolve such biases, or they might even use such biases as a source of information (e.g., one partner’s false belief in a mutual friendship that is not reciprocated; Knoke & Yang, 2008). The vast amount of quantitative data generally collected in social network analyses can then allow for qualitative descriptions of peer social networks.

To measure bully-victim networks, children can first be informed about the definition of bullying and be asked about different forms in which they may be victimized. If they indicate that they are victimized at least once on any item, they can be asked by whom they were victimized. In addition, they can be asked questions about how harmful this was for them (intensity), whether the aggressor was stronger or more popular than them (power imbalance), whether they were sure that the aggressor did it on purpose (goal-directedness), and whether the other did it to look cool (proactive) or to take revenge (reactive). In this way, one can test whether all aspects of the definition of bullying proposed earlier play a role in a specific bully-victim relationship. In sum, the benefits of combining self-report with network data, are many-

sided and they represent an important new way of improving our insights into the social aspects of bullying.

Observational Reporting

Observer reports offer the advantages of both self- and peer-reports without most of their drawbacks, and can be used on their own or as part of a social network analysis. Informed observational reports should involve an impartial observer who is intimately familiar with the social dynamics of the group to record actual behaviors. This familiarity would allow an informed observer to properly identify and note power imbalances, harm, and (when possible) the goals of the individuals involved in bullying, and should be based on previous observational, self- and peer-report data on the group's social dynamics. The ground-breaking work conducted by Craig, Pepler, and colleagues on school playgrounds is an example of this kind of research. By using video cameras and remote microphones they were able to observe incidents of bullying, revealing new insights about its' forms, frequency, and social structures (Craig & Pepler, 1999; Craig, Pepler, & Atlas, 2000; Hawkins et al., 2001; O'Connell, Pepler, & Craig 1999; Pepler & Craig, 1994).

More recently, Underwood and colleagues (2012) have undertaken a large-scale longitudinal observational study of mobile phone cyberbullying and aggression. They provided free phones to an entire school cohort under the agreement that their text messages could be studied for research purposes. This technique is now providing data for recognizing, categorizing, and analyzing electronic bullying such as the use of hostile text messages (Ehrenreich, Underwood, & Ackerman, 2014).

Unfortunately, informed observational research is exceptionally costly. It requires large amounts of time, effort, and resources. This lengthy observer learning period is then followed by

a lengthy observational period that is then subject to a lengthy event analysis. This enormous expenditure of time and effort is amplified if researchers seek to measure forms of bullying that are intended to be covert and unobservable. Observational data also raise ethical and legal issues about privacy as well as the responsibilities of an observer who witnesses serious episodes of bullying (Casper et al., 2015). The requisite depth of familiarity required for observational research can potentially impinge upon the impartiality of the observer as well as alter the behaviors of the observed participants (particularly older children; Pepler & Craig, 1994). Additionally, concerns over when and who to warn about bullying behavior deprives participants of anonymity and is, thus, a salient concern for, in particular, observational data collection (Pepler & Craig, 1994). While there are often local or federal guidelines for reporting serious issues of past, present, and imminent harm (e.g., Federal Certificates of Confidentiality from the National Health Institution), researchers must often negotiate with stakeholders what will and what will not be reported to authorities (e.g., Underwood et al., 2012). Another related issue with observational data (that also often applies to social network data) is what to do with observations (or peer reports) of individuals who have not consented to be part of the study. Should they be ignored/deleted as data, retained, or considered to be part of a larger blanket of consent (e.g., *in loco parentis* offered by school principals; Pepler & Craig, 1994)? We do not offer concrete ethical recommendations on these matters as they tend to be complex, but we do urge researchers to consult previous literature for successful exemplars of how to deal with these issues (e.g., Pepler & Craig, 1994; Underwood et al., 2012).

Interestingly, newer observational research methods demonstrate that there are potentially cheaper ways of conducting observational research by focusing on a targeted series of interactions. For example, online computer games have been used to observationally assess

bullying within the context of those games (Mancilla-Caceres, Espelage, & Amir, 2015; Mancilla-Caceres, Pu, Amir, & Espelage, 2012). Competitive games can be used as quasi-experimental tools for evoking and observing the behavior of participants non-intrusively, and for gathering information about the friendships and the roles that each participant plays within their groups. They offer the advantage of being an inexpensive way of obtaining large amounts of data while preserving desirable methodological characteristics such as being able to control the situation in which ethical experimentation may be conducted. Research among 93 fifth-grade students indicated that self-report scales converged with the type of interactions and communications recorded during the game (e.g., prosocial messages, bullying; Mancilla-Caceres et al., 2015). These correlations contribute to the understanding of how face-to-face bullying relates to bullying in computer-mediated communication and highlight how observational data can contribute novel ideas and data to the study of bullying.

In its absence, we revert to our recommendation of using a combination of peer- and self-report data where possible, including network data. We generally do not recommend relying solely on third-party reports such as teachers or managers, who we view as useful supplements to the aforementioned data unless they are the specific focus of one's research (e.g., a survey on teacher's attitudes toward bullying).

4. Sample

We next turn our attention to highlighting the importance of choosing an appropriate sample. We recommend the APA guidelines (2010) for using a priori power analyses to guide sample sizes (e.g., Faul, Erdfelder, Lang, & Buchner, 2007). Targeted sampling may increase statistical power related to bullying groups. However, the positively skewed distribution of bullying (Craig et al., 2009) typically combined with the low frequency of bullying behaviors

also affects statistical comparisons that rely on normal distributions (Glass & Hopkins, 1996). It is also a concern if researchers categorize individuals into behavioral categories (versus using continuous behavioral scores) given that unequal group sizes often put into question the assumption of homogeneity of variance, leading to potentially inflated Type II error (Glass & Hopkins, 1996). Thus, the numerical size, distribution, and classification of one's sample is an opening consideration when sampling bullying behaviors, particularly when researchers choose to compare bullies, victims, bully-victims, and non-involved children or adolescents (Veenstra et al., 2005).

We also recommend that unless researchers are interested in a particular population, samples should strive to recognize the diversity inherent amongst the populations of inference. Ideally, the presence of a logic model should make clear which sample characteristics are likely to be particularly relevant for a given piece of research or intervention. Notably, bullying's forms and prevalence change over the course of the lifespan (Pepler, Jiang, Craig, & Connolly, 2008; Volk, Craig, Boyce, & King, 2006). There is also growing evidence that the outcomes of bullying may change over development (Espelage, Van Ryzin, & Holt, in press; Reijntjes et al., 2013; Swearer et al., 2017; Troop-Gordon, 2017). These changing goals and outcomes appear to alter the efficacy of intervention efforts (Smith, Salmivalli, & Cowie, 2012; Yeager, Fong, Lee, & Espelage, 2015). The wide age range of individuals who bully (from preschoolers to adults; Smith, 2004; Vlachou, Andreou, Botsoglou, & Didaskalou, 2011) makes it important for researchers to match the sample age to one's logic model and questions of interest (Casper et al., 2015). Finally, much of bullying has been collected using middle-class, mostly white Western European or North American samples. Although this is starting to change (e.g., Smith, Kwak, & Toda, 2016), we urge researchers to be aware of the diversity of populations both in their

sampling choices and in the generalizability of their results to different populations. This may be particularly important when considering the cross-cultural validity of different terms and different stakeholders definitions associated with bullying.

5. Design

Once decisions about reporters and sample characteristics are made, the next step is to determine the methodological nature of the study. At the most basic level is whether it will be experimental, correlational, or descriptive. To date, the vast majority of research on bullying has been correlational in nature with a growing literature that employs longitudinal designs (Davies & Pickles 1985; Espelage, Low, Rao, Hong, & Little, 2014). This is because of practical and ethical restrictions surrounding experimental studies of bullying, because it is difficult or unethical to manipulate power levels in natural settings or bully individuals to observe the harm it may cause. There are some exceptions (e.g., studying attitudes instead of behaviors; Cunningham et al., 2009; Ojala, & Nesdale, 2004; quasi-experimental designs; Mancilla-Caceres et al., 2015), but the literature is largely devoid of experimental studies of the kind seen in the aggression literature (e.g., Vaillancourt & Sharma, 2011). Descriptive studies are frequently conducted in bullying to determine population base rates of bullying (Owuamanam, & Makinwa, 2015). However, descriptive data can also be important in revealing trends about bullying that were previously unknown, as revealed by observational studies of bullying (e.g., Craig & Pepler, 1998) or qualitative interviews of participants (Hellström et al., 2015). Whereas we generally promote quantitative analyses because of their impartiality, the use of descriptive qualitative data is almost certainly to be a fruitful enterprise in studies of bullying (Patton, Hong, Patel, & Kral, 2017; Thornberg, 2011). In particular, qualitative data may be helpful in testing the validity and translation of definitions from theory to stakeholders or vice versa (Garbarino & deLara, 2002).

Thus, whereas we generally support correlational data as a good way of studying child development in its actual context, we recognize a need for more causal/experimental research as well as continued efforts to further refine our descriptive understanding of bullying, as called for by the theoretical questions at hand.

6. Limitations

We have presented a series of recommendations for conducting bullying research, but we recognize that all research has constraints and limitations. Ethical, financial, and practical constraints play an important role in what and how research is performed. These constraints perhaps most strongly relate to one's choice of observers and sample, as social network and observational data are generally more expensive to collect than peer- or individual-report data that are generally more expensive than teacher/staff data and may present challenging ethical issues and constraints (see above). Qualitative data are often more expensive to code than quantitative data while longitudinal data are typically more expensive and challenging to collect than cross-sectional data. Thus, there are numerous ways for practical constraints to run counter to our suggestions.

We thus again repeat our assertion that researchers should use, as much as is possible, their hypotheses and logic models to guide their choice of sample sizes and sources. If one is interested in studying bullying within adolescent intimate relationships, researchers with limited resources may be better served by avoiding large, expensive, general surveys versus a smaller number of in-depth qualitative interviews. There are numerous publications about how to boost potential sample sizes and statistical power (e.g., McClelland, 2000), but our general recommendation is to prioritize the validity of one's sample and methodology with respect to chosen definitions, hypotheses, and logic models. This also applies to the use of archival data,

where researchers often try to fit a square peg in a round hole by using imprecise measures (e.g., using existing longitudinal data that lacks information about power imbalances within aggression). Again, our goal is not to dictate what should and should not be done but rather to encourage researchers to make explicit their methodological choices (including compromises) and then discuss the consequences of those choices for the research at hand. Thus, if one only has teacher-report data, one should focus on questions that theoretically fit with teacher-report data and comment on the potential limitations of their data.

The latter is an important issue regardless of one's constraints. As formally recommended by the APA publication manual (p. 36, 2010) we strongly encourage researchers and interventionists to consider their initial assumptions and logic models after completing data collection and analysis. There is a justifiable desire to shape one's discussion to one's data. This simplifies and clarifies the literary flow of a journal article or intervention report. Whereas we acknowledge the utility of this clarity in writing, we also strongly urge authors to consider the limitations of their research and to explicitly discuss the more pertinent limitations in dissemination products. With regard to reliability, are the measures repeatable and do they apply across populations that differ from one's sample? With regard to validity, are the important aspects of one's definition and variables of interest adequately captured? The discussion should not only include an interpretation of the results within the context of the study and the broader literature, but also a discussion of the validity and reliability of the research or, in the case of some qualitative research, of the credibility and authenticity of the data. Clearly stated limitations not only help to properly situate one's results, they also serve as valuable guides to future research by indicating areas where knowledge is missing, mixed, unreliable, or invalid (Renger & Titcomb, 2002).

Limitations also help inform the creation and interpretation of meta-analyses related to bullying (Smith, Cowie, & Salmivalli, 2012). A frank discussion of effect sizes can help inform the statistical power of future studies as well as the likely potential for intervention success or outcome risks. A combination of effect sizes and limitations also helps with the creation of future logic models that can explicitly incorporate and address prior limitations. Finally, limitations foster a humble approach to bullying that emphasizes the need for ongoing basic and applied research rather than settling for premature solutions that are likely, at best, to be only partly successful, and at worst iatrogenic (e.g., Merrell, Gueldner, Ross, & Isava, 2008).

7. A Bullying Research Checklist

We end with an approximate checklist for researchers to aim to follow in order to maximize the theoretical strength, reliability, and generalizability of their research:

- 1- State and justify your chosen definition of bullying.
- 2- Outline the theoretical logic underlying your hypotheses and how it pertains to your chosen definition and program of research/intervention.
- 3- Use one's logic model and theoretical predictions to determine which kind of measurements are most appropriate for testing one's hypotheses. There is no gold standard measure of bullying, but be aware of the strengths and weaknesses of the different types of measures. Where possible, use complimentary forms of measurement and reporters to offset any weaknesses.
- 4- Implement an appropriate research or intervention design (longitudinal if possible) and recruit an appropriate sample.
- 5- Reflect upon the final product, its associations with the chosen logic model and theory, and explicitly discuss important pertinent limitations with a particular emphasis on issues concerning the theoretical validity of one's findings.

8. Conclusion

We appreciate that methodology is a constantly fluctuating target for most areas of research, including bullying. The steps we propose are, in our opinion, crucial for the continued advance of bullying research and interventions. The data are clear that bullying is highly harmful to many individuals. To their credit, researchers have responded in great numbers to address this problem. Unfortunately, this very response has revealed and magnified the underlying theoretical and methodological weaknesses present in the field for defining and measuring bullying. We recommend all bullying research to be conducted with a firm eye toward standardizing definitions and measures in a way that facilitates the connection of findings from one study to another. Repeating a study in the aims of replication is beneficial for knowledge. Replicating a study when one is ignorant of the compatibility of existing results is likely to only introduce confusion and impede progress within the field. The very act of grounding one's research in theory is likely to induce a greater awareness of similar research as researchers can more easily search for similar hypothesis tests within the literature.

Unless a systematic effort is made by the bullying research community, there is the danger that the exponential growth in the study of bullying will result in an exponential growth of the noise to signal ratio. As definitions become fuzzier and measurements more diverse, we may end up as an increasing number of separate tribes of researchers who are working in isolation to produce results that are not easily compared across measures or definitions. These issues are important not only for basic research, but for applied/intervention research, as well as public policy and the legal discussions based on those policies. We believe the time is right for a general call to action to prevent such an outcome and instead foster a more cohesive and

coherent bullying research community that can accelerate our understanding and response to this serious issue.

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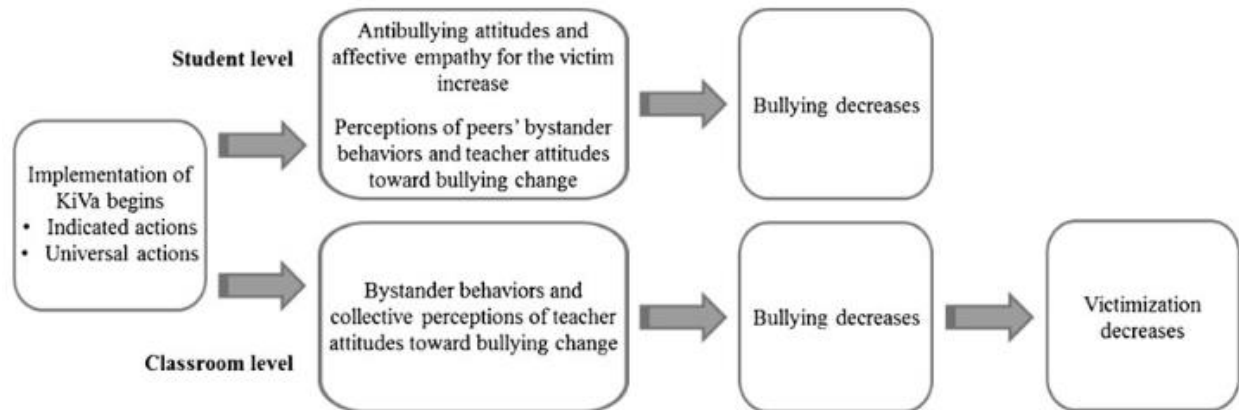


Figure 1. Theoretical logic model of the effects of the KiVa program (adapted from Saarento, Boulton, & Salmivalli, 2015).

