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Conceptualization and Measurement of Adolescent Prosocial Behavior: Looking Back and Moving Forward

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The struggle to cast a net around the numerous ways prosocial behavior is expressed lends itself to the absence of widely accepted methods of measurement. Additionally, research intent on evaluating the psychometric properties of current approaches has been somewhat limited. Weaving together seminal as well as contemporary research, the current review focuses on how these conceptual and measurement issues pertain to adolescent studies (in an intentional effort to offset the somewhat disproportionate focus directed toward prosocial development in infants, children, and adults). Recommendations to address current limitations and attain a more nuanced understanding of the construct are presented and discussed.

The scientific study of prosocial behavior has undergone several transformations since first making its way onto the research stage in the early 1970s (Hay, 1994). Interest in the topic has ebbed and flowed over the years, spanning across a range of disciplines including anthropology, economics, education, psychology, and sociology, which collectively have produced a body of broad and compelling work (Bénabou & Tirole, 2006; P. Brown, Corrigan, & Higgins-D'Alessandro, 2012; Gurven & Winking, 2008). Although often recognized as a desired behavioral outcome in and of itself, prosocial behavior's associations with several other positive indicators of development including academic achievement (Caprara, Barbaranelli, Pastorelli, Bandura, & Zimbardo, 2000), self-esteem (Zuffiano et al., 2014), self-efficacy (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996), civic engagement (Kanacri et al., 2014), empathy (Laible, Carlo, & Roesch, 2004), emotional reactivity, self-regulation (Carlo, Crockett, Wolff, & Beal, 2012), and resilience factors (Haroz, Murray, Bolton, Betancourt, & Bass, 2013) have been documented by social scientists. Moreover, engaging in prosocial behavior has also been found to counteract depression and anxiety (Haroz et al., 2013), as well as reducing antisocial behavior (Kokko, Tremblay, Lacourse, Nagin, & Vitaro, 2006; Raskauskas, Gregory, Harvey, Rifshana, & Evans, 2010).

It is important to note, however, that within this notable surge in research studies uncovering the positive implications of prosociality, there is a disproportionately greater focus directed toward infancy (Brownell, 2013; Dunfield, Kuhlmeier, O'Connell, & Kelley, 2011), toddlerhood (Hay & Cook, 2007; Svetlova, Nichols, & Brownell, 2010), and early childhood (Eisenberg, Spinrad, & Knafo-Noam, 2015; Knafo & Plomin, 2006; Romano, Tremblay, Boulerice, & Swisher, 2005), with far fewer studies bringing a developmental perspective to the issues of defining and measuring prosocial behavior during adolescence. This is despite evidence suggesting the frequency and nature of prosocial behaviors may change during this age period as a result of (1) cognitive and affective development (e.g., developing a greater capacity for abstract thinking, role taking, affective labeling, moral reasoning); (2) changes in interpersonal relations (e.g., simultaneous increase in frequency of face-to-face contact and digital communication with peers and decrease in time spent with family); and (3) changes in social context (e.g., increase in school population size coinciding with a more departmentalized and impersonal environment, disruption to social regularities and a necessary social role restructuring; Goldstein, Boxer, & Rudolph, 2015; Shifflet-Chila, Harold, Fitton, & Ahmedani, 2016; Steinberg, 2005). Therefore, with the continuing development of social cognition and emotional regulation, changes in familial, relational and educational processes, as well as an actual relocation from the typically more intimate elementary school context to a more impersonal, larger-scale secondary school, it is important to expand the study of prosocial behavior with a greater focus on adolescence.

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Addressing this shortcoming appears to be well-timed with ongoing efforts to shift toward strength-based approaches that promote a comprehensive and holistic view of youth (Larson, 2000; Lerner, Phelps, Forman, & Bowers, 2009). Several opportunities have surfaced to leverage prosocial behavior in the promotion of current and future intervention efforts; however, attempts to do so may be hindered by various measurement challenges. Perhaps at the crux of these issues is the lack of agreement on conceptual specification of the construct. Often branded an "umbrella" term, prosocial behavior has referred to helping (Hampson, 1984), sharing, caring (Eisenberg & Mussen, 1989), comforting (Jackson & Tisak, 2001), altruism (Bierhoff, 2002), and acting sociably (Eisenberg-Berg & Hand, 1979). Additional challenges arise when discerning behaviors that are more appropriately classified as social conventions or etiquette (e.g., politeness, respect, courtesy; Talwar, Murphy, & Lee, 2007), learning-related behaviors (e.g., cooperating with peers and teachers, following instructions, containing frustration; Coolahan, Fantuzzo, Mendez, & McDermott, 2000), as well as effectively taking into account the environment in which they are performed (e.g., home, school, team sport, dire emergency; Barr & Higgins-D'Alessandro, 2007; Rutten et al., 2011; Yoo, Feng, & Day, 2013). Consequently, a hodgepodge of definitions has emerged, each placing different levels of emphasis on various antecedents or consequences. For instance, researchers have explored the intention–outcome distinction of prosocial acts (Vaish, Carpenter, & Tomasello, 2010), the underlying motivation driving the behavior (e.g., egoistic vs. altruistic; Batson & Shaw, 1991; Maner & Gailliot, 2007), the identifying characteristics of the actor vs. recipient and the perception of the behavior as high- vs. low-cost (Padilla-Walker & Fraser, 2014) and/or spontaneous vs. planned (Amato, 1990). To further highlight the absence of consensus, a sampling of construct definitions and nomological networks related to prosocial behavior (altruism and helping behavior) are provided in Table 1. Although the range of definitions produced across these three interrelated terms stresses the lack of scientific precision in construct operationalization, it also reveals points of intersection. The key tenet: the behavior benefits another person. However, further delineating criteria include the target of the behavior (e.g., person, group or society), how the recipient is impacted (e.g., well-being, welfare, instrumental need), what the intended goal of the action is (e.g., obtaining reward/avoiding punishment), and how the benefactor is impacted (e.g., at a personal cost, sacrifice, without expectation). Prosocial and helping overlap the most in definitional criteria, referencing (broadly) positive consequences for another individual, whereas altruism places greater emphasis on determining the underlying motivation (i.e., altruistic vs. egoistic) and the extent of costs incurred by the actor.

Previous efforts to address this tangled web have included borrowing taxonomic systems from the aggression literature, attempting to differentiate between various forms of prosocial behavior (e.g., anonymous, public, altruistic, emotional, compliant, dire; Carlo & Randall, 2002), as well as their different functions (e.g., proactive/instrumental vs. reactive, egoistic vs. altruistic; Batson & Powell, 2003; Boxer, Tisak, & Goldstein, 2004). However, none of these endeavors to define prosocial behavior and address its phenomenological and etiological complexity have led to a universally agreed-upon formulation or acquired the ascendancy necessary to guide the literature. These issues are raised not to argue in favor of one definition over another, but rather to note the difficulties that surface in a literature rife with inconsistent language, and the weakened inferences that are ultimately drawn from empirical work as a result. The task at hand is to encourage sound conceptual specification of the construct putting the onus on researchers to (1) avoid using terms synonymously or relying on proxy variables (e.g., showing empathy); (2) provide clearer distinctions between overlapping forms of prosocial behavior (e.g., caring and comforting); and (3) offer more explicit descriptions of how prosocial behavior types and the selected measures of a study align with their proposed research questions. To further underscore this last point, in a review intended to examine the present state of construct measurement, the degree of research attention toward this end appears inadequate. Within the existing body of research, there often seems to be a trade-off in favor of theoretical relationships among constructs related to adolescent prosocial behavior, with an implicit belief in the adequacy of its measures (i.e., often employing them without corresponding tests for unidimensionality, reliability, convergent, discriminant, and predictive validity). Yet in the absence of a systematic basis to perform measurement evaluation, confidence in research results is considerably eroded.

The overarching goal of the current review is to place under scrutiny the measurement of adolescent prosocial behavior, beginning with an acknowledgment of the tangled web of definitions

TABLE 1
A Sample of Previously Used Definitions for Prosocial Behavior, Altruism, and Helping Behavior

Study	*Construct definition*
Prosocial Behavior	
Batson and Powell (2003)	Covers the broad range of actions intended to benefit one or more people other than oneself—behaviors such as helping, comforting, sharing, and cooperating.
Christoph, Gniewosz, and Reinders (2014)	Helping behaviors toward unknown people in everyday life.
Dunfield et al. (2011)	Any behavior that an individual engages in to benefit another.
Eisenberg and Miller (1987)	Voluntary, intentional behavior that results in benefits for another; the motive is unspecified and may be positive, negative or both.
Eisenberg et al. (2015)	Any voluntary behavior intended to benefit another.
Eisenberg and Mussen (1989)	Voluntary actions that are intended to help or benefit another individual or group of individuals.
Epps, Park, Huston, and Ripke (2005)	Positive or prosocial behaviors can include social skills for relating to peers and adults, empathetic and helpful actions, responsibility, autonomy and self-control.
Grusec, Davidov, and Lundell (2002)	Voluntary behavior that intentionally produces a benefit for another person, regardless of whether this behavior is costly/beneficial to the donor, for example, helping others or sharing with them.
Gurven and Winking (2008)	Any voluntary action that may benefit other individuals, such as sharing, comforting, helping, rescuing, or defending.
Hastings, Utendale, and Sullivan (2007)	Proactive and reactive responses to the needs of others that serve to promote the well-being of others.
Hay and Cook (2007)	Feeling for another (friendliness, affection, empathic concern), working with another (cooperative activity and goal-setting, sharing resources, helping another to accomplish tasks) and ministering to another (nurturing, comforting, providing resources, responding to another's wishes and needs).
Penner, Dovidio, Piliavin, and Schroeder (2005)	Defined by some significant segment of society and/or one's social group as generally beneficial to other people.
Staub (1979)	Voluntary behavior intended to benefit another person.
Twenge, Baumeister, Dewall, Ciarocco, and Bartels (2007)	Actions that benefit other people or society as a whole.
Weinstein and Ryan (2010)	Acts undertaken to protect or enhance the welfare of others . . . includes helpful interventions, volunteer work, and the donating of money or blood, among other examples.
S. R. Zeldin, Savin-Williams, & Small (1984)	An act benefitting another individual in which the actor is not fulfilling any explicitly defined role obligation and the behavior of the actor is not solicited by another individual.
Altruism	
Bar-Tal (1982)	Voluntary and intentional behavior carried out for its own end to benefit a person as a result of moral conviction in justice and without expectations for external rewards.
Batson and Powell (2003)	Self-sacrificial helping or helping in the absence of obvious, external rewards.
Carlo and Randall (2002)	Voluntary helping motivated primarily by concern for the needs and welfare of another, often induced by sympathy responding and internalized norms/principles consistent with helping others.
de Waal (2008)	[Biological] Behavior that increases the recipient's fitness at a cost to the performers.
Dunfield et al. (2011)	Other-oriented behaviors [that] are an integral part of human life, playing an important role in successful social interactions and peer acceptance.
Eisenberg and Miller (1987)	Voluntary behavior intended to benefit another, which is not performed with the expectation of receiving external rewards or avoiding externally produced aversive stimuli or punishments.
Eisenberg, Zhou, and Koller (2001)	Voluntary prosocial behavior motivated by the desire to benefit another rather than by social or economic rewards.
Fehr and Fischbacher (2003)	[Behavioral] Costly acts that confer economic benefits on other individuals.

TABLE 1 (Contd.)
A Sample of Previously Used Definitions for Prosocial Behavior, Altruism, and Helping Behavior

Study	*Construct definition*
Greener (2000)	Subtype of prosocial behavior which is performed without the expectation of reward or to avoid punishment.
Gurven and Winking (2008)	Special case of prosociality in which an actor benefits others but at personal cost.
Hastings et al. (2007)	Sacrificing one's own gain in order to promote another's well-being.
West, Griffin, and Gardner (2007)	[Evolutionary] Behavior that enhances the fitness of the recipient of the help, but diminishes the fitness of the helper.
Zahn-Waxler and Radke-Yarrow (1982)	Regard for or devotion to the interest of others.
Helping behavior	
Batson (1991)	A motivational state with the ultimate goal of increasing another's welfare.
Batson (2011)	A desire to benefit someone else for his or her sake rather than one's own.
Dovidio, Piliavin, Schroeder, and Penner (2006)	An action that has the consequence of providing some benefit to or improving the well-being of another person (e.g., giving a gift, providing resources to accomplish a task).
Dunfield et al. (2011)	An action that is intended to alleviate an instrumental need (e.g., recognizing and responding to another individual's inability to complete a specific goal-directed action).
Fehr and Fischbacher (2003)	Costly acts that confer economic benefits on other individuals.
Kahana, Bhatta, Lovegreen, Kahana, and Midlarsky (2013)	Proactive adaptations that contribute to positive outcomes even in the face of the normative stressors.
Kerr, Godfrey-Smith, and Feldman (2004)	Behavior that benefits others at a personal cost to the behaving individual.
Margolis (1982)	When the costs of the behavior exceed the benefits; that is. there is some sacrifice involved.
Sparrowe, Soetjipto, and Kraimer (2006)	Discretionary behaviors intended to benefit other work group members or the group as a whole.

TABLE 2
Measuring Adolescent Prosocial Behavior: Strengths and Limitations of Four Common Methods

Approach	*Strengths*	*Limitations*
Self-report questionnaires	Practical and easy to administer Relatively low cost ↑ Opportunity for longitudinal use Can be administered to large and diverse samples May help distinguish between indicators of intention/motivation/behavioral	↓ Reliability of recall ↑ Social desirability bias Use of retrofitted measures (different original purpose) or instruments that have not undergone psychometric tests of invariance Situations described are hypothetical
Behavioral ratings	Practical and easy to administer Relatively low cost ↑ Opportunity for longitudinal use ↓ Social desirability and shared method biases May provide varying perspectives on individual's behavior (in different contexts and roles)	Susceptible to halo effect and central tendencies Single-informant is limited in utility and inclusion of multiple informants not always possible
Observational methods	↑ Ecological validity and reliability ↑ Accuracy in estimate of subject's propensity to engage in prosocial behavior within specific settings Can provide, detailed information about focal participants and surrounding contexts More easily linked to development of interventions	Time consuming and labor intensive ↓ probability of observing infrequent and covert prosocial behaviors May require ↑inference[b] Difficult to conduct unobtrusive data collection→ subject reactivity May requires knowledge of group dynamics/relationships Potential inherent biases in observers Limited in scope (focus on narrow range of behaviors/situations)
Experimental design	Flexible procedures suitable for different games Allows for causal inference ↑ Control, ↓ relevance of confounding factors/contexts More easily linked to development of interventions	Contrived setting of laboratory Sometimes employ artificial assumptions ↓ generalizability (typically focus on narrow range of behaviors/situations) ↑ difficulty in implementation (more challenging to obtain large samples/conduct longitudinal research)

[a]May apply only to *naturalistic* studies (not analogue).
[b]May apply only to *analogue* studies (not naturalistic).

often applied in its study, including the social, emotional, and cognitive concomitants that are often caught in its net. Next, the following section provides a rundown of four common approaches in measuring prosocial behavior, highlighting key strengths and limitations of each one, with references to illustrative studies that demonstrate their utility. The third section examines broader unresolved issues that persist across multiple measurement approaches. Finally, the review concludes with recommendations in moving forward, arguing the scope of research in adolescent prosocial behavior may be advanced with an increased focus on the following: (1) sound conceptual specification of research constructs prior to fitting them to explanatory models; (2) rigorous testing of the conceptual and psychometric equivalence of prosocial measurement tools; (3) expanding the use of currently available measurement approaches within study designs; and (4) further innovation in measurement development that capitalizes on advances in technology and the inclusion of youth voice.

STRENGTHS AND LIMITATIONS OF CURRENT MEASUREMENT APPROACHES

Historically, the study of prosocial behavior has largely been explored through four general approaches: *self-report questionnaires*, *behavioral ratings*, *observational methods*, and *experimental design*, with an overwhelming preference for the first two due to the economic and practical advantages. To a lesser extent, research studies have also explored peer-referenced assessment (e.g., peer nominations and peer ratings) as indirect means to extract information regarding a participant's prosocial behavior by way of social status (Gresham & Stuart, 1992; Whitcomb, 2017). However, the number of studies employing sociometric procedures during childhood far outnumber adolescence, and given computed scores are often based on *peer liking* or *level of acceptance*, this remains one step removed in the measurement of the construct. Therefore, the current review remains focused on the previously listed approaches, providing an overview of the "pros" and "cons" associated with each (also summarized in Table 2), followed by points for consideration in future studies.

Self-Report Questionnaires

With its relatively low cost and ease of administration, self-reports reign as the preferred method of assessment in the study of prosocial behavior, offering a number of persuasive advantages. Not only does this form of measurement lend itself to use with larger samples and longitudinal data collection, but it may be particularly equipped in assessing forms of prosocial behavior that occur infrequently or within contexts that are not readily accessible to observation (e.g., private social exchanges between adolescent peers). Additionally, self-report measures provide opportunities to simultaneously collect information on attitudes, values, intent and motives related to the prosocial exchange in question, all of which can help further unpack our understanding of the construct. Indeed, self-reports can serve as a great tool to tease apart antecedents or situational factors that may contribute to the type of prosocial behavior performed or the frequency with which it occurs.

On the flipside, however, the highly desirable nature of prosocial behavior and the societal approval it garners allows for contamination due to self-presentational concerns (M. F. King & Bruner, 2000; Uziel, 2010). Subjects' inclination to rate themselves highly on positive behaviors may be heightened in keeping with an urge to be perceived as "good." To understand the degree to which social desirability poses a threat to validity in self-report measures on sensitive constructs, Fernandes and Randall (1992) performed an undergraduate study assessing its bias effects with three sensitive constructs: *prosocial behavior*, *unethical behavior*, and *ethical attitudes*. Interestingly enough, self-reported attitudes were more frequently characterized by social desirability bias than self-reported behaviors. This seems to imply that subjects may have an easier time engaging in overestimations or exaggerations of prosocial attitudes, as opposed to misrepresenting engaging in actual prosocial behaviors. One of the more obvious solutions to counter the potential bias would be the inclusion of social desirability measures in study designs (e.g., Marlowe-Crowne Scale, Balanced Inventory of Desirable Responding; Crowne & Marlowe, 1960; Paulhus, 1998). Although these are sometimes employed as comparison measures during instrument development (Carlo & Randall, 2002; Peterson & Seligman, 2004), few empirical studies examine social desirability alongside prosocial behavior indices (for a recent exception, see Kauten & Barry, 2016). This may in part be due to the suggestion that social desirability is tapping into aspects of prosocial behavior, and therefore controlling for it may be a conservative analytic strategy (Eisenberg, Carlo, Murphy, & van Court, 1995) or because the utility of social desirability

instruments have been called into question with arguments that they are more equipped to identify individuals who demonstrate high levels of self-control (particularly in social contexts; Uziel, 2010).

In addition to the challenges of circumventing social desirability, previous research has suggested two other potential threats to the psychometric response quality of adolescent self-reports. First, compared to adults, there is a higher incidence of incomplete, inconsistent, exaggerated and acquiescent responding among youth reports (Borgers, de Leeuw, & Hox, 2000; Keefer, Holden, & Parker, 2013; Soto, John, Gosling, & Potter, 2008). Second, in the case of prosocial behavior, there are possible confounding developmental changes in the structure of the target construct itself that likely affect adolescents' capacity to self-report accurately and reliably (i.e., youth's perceptions of themselves as "prosocial" may diverge from a global sense of being "good" or "prosocial" to distinct self-concepts within specific domains of prosociality; Harter, 2012; Keefer, 2015).

In short, self-reports can provide unique information that can meaningfully add to our understanding and promotion of prosocial behavior. However, there is a long-standing reservation regarding their use due to their susceptibility to systematic response biases unrelated to the target construct (see Future Directions in Self-report Questionnaires and Behavioral Ratings for further discussion on how to address the aforementioned measurement issues).

Behavioral Ratings

In an effort to corroborate self-report findings, researchers often call upon informants who know the adolescent well (e.g., parents, teachers, peers) to provide behavioral ratings (Whitcomb, 2017). Items on the scales can either refer to a specific action (e.g., "will invite bystanders to join in a game," Prosocial Behavior Scale; Weir & Duveen, 1981) or describe more broad attributes (e.g., "good leader," Peer Nomination Instrument; Crick & Grotpeter, 1996). Informants are then asked to estimate the degree to which it holds true for the subject (e.g., *rarely applies*, *applies somewhat*, *certainly applies*; see Appendix S1 in the online Supporting Information for list of measures used in the study of adolescent prosocial behavior). Similar to the use of self-reports, the widespread popularity of behavioral ratings is not incidental. Among the many advantages, the varying perspectives on an individual's behavior can be quite informative, particularly when different reporters observe the same adolescent in distinct contexts and/or social roles (e.g., teachers vs. parents, peers vs. parents; Noland & McCallum, 2000). Compared to direct behavioral observation, they are less time consuming (e.g., no training involved), more economical, and capable of providing data on low frequency and/or covert behaviors that may be missed within the constraints of conducting brief observation sessions (Sattler, 2014; Whitcomb, 2017).

Objections to the use of prosocial behavior ratings are often mentioned as due to their susceptibility to response bias, including the possibility of *halo effects* (e.g., rating an individual more highly on prosocial behaviors because they have a pleasant demeanor or follow instructions well) and *central tendency effects* (e.g., choosing a midpoint rating such as *sometimes* in an effort to avoid extreme ends of scale such as *never* or *always*; Finley, Osburn, Dubin, & Jeanneret, 1977). Recent and/or unusual incidents of prosocial behavior may also be given disproportionate weight when completing a rating scale (e.g., invitations to a recent birthday party vs. day-to-day inclusive behaviors; Worthen, Borg, & White, 1993). Given certain prosocial behaviors occur in lower frequency, this may ultimately lead to reports that are less reflective of a subject's overall prosocial tendencies and more indicative of isolated events of behavior.

In general, empirical evidence has supported the validity of teacher reports on prosocial behavior, particularly with younger children. Parents, on the other hand, often demonstrate lower internal consistency and test–retest reliability (Ladd, Herald-Brown, & Andrews, 2009; Stone, Otten, Engels, Vermulst, & Janssens, 2010). More importantly, one of the most consistent findings in rating scale research with adolescents is the low to moderate agreement between different pairs of informants (e.g., teacher–parent, parent–adolescent, and parent–peers; Renk & Phares, 2004; Stone et al., 2010; van Widenfelt, Goedhart, Treffers, & Goodman, 2003). Somewhat stronger associations have been found between early adolescent and teacher reports (Nantel-Vivier et al., 2009), but this may simply be due to sampling from the same context (i.e., school). Reports of other combined pairings of raters sharing similar environments have also demonstrated larger correlations (e.g., teacher–teacher, mother–father), further substantiating the notion of situational specificity in prosocial behavior (Gresham, Elliott, Cook, Vance, & Kettler, 2010). This reemphasizes the notion that rating scales are not objective measures of an adolescent's prosocial

behavior; rather, they involve capturing the behavior from the unique vantage point of a particular rater, which can be influenced by familiarity with the adolescent, conditions under which the rater has had the opportunity to observe the adolescent, as well as the respondent's own memory, motivation, values, or mental state at the time of the assessment (Kaurin, Egloff, Stringaris, & Wessa, 2016; Kraemer et al., 2003; McConaughy, 1993). As such, these ratings represent the quantification of *perceptions* of prosociality (not a behavior at the time and place of its actual occurrence; Gresham & Lambros, 1998; Whitcomb, 2017).

Future Directions in Self-report Questionnaires and Behavioral Ratings

Because researchers continue to rely on self-report and informant-rated measures, it is important to explore different strategies to control for response bias and address validity issues. Beyond ensuring a measure is developmentally appropriate and culturally relevant with explicit validation of its use with the target population (see Testing for Conceptual and Psychometric Equivalence for further discussion), researchers are encouraged to explore innovative approaches that counteract the influence of social desirability, acquiescence, and reference bias. A. Brown and Maydeu-Olivares (2013) argue one way to avoid the issue altogether is to administer items in a forced-choice format. This requires respondents to choose between two or more equally desirable options, thus eliminating the possibility to "fake good" or "acquiesce to everything." Similarly, researchers have proposed supplementing questionnaires with anchoring vignettes (for the purposes of calibrating responses) in order to address reference bias. However, this too has been challenged as it increases respondent burden and the extent to which it corrects for reference bias has yet to be determined (Duckworth & Yeager, 2015; G. King, Murray, Salomon, & Tandon, 2004; Kyllonen & Bertling, 2013).

In thinking about the well-documented discrepancy found among informants, it is important to recognize the context specificity of prosocial behaviors and acknowledge how each one serves as an integral piece of the puzzle (Achenbach, McConaughy, & Howell, 1987; Caprara & Pastorelli, 1993). The expectation of convergence between informants reflects an implicit conceptualization of prosocial behavior as a unitary construct that generalizes across settings. Mounting evidence, however, suggests prosocial behavior varies reliably and meaningfully across interpersonal situations (Padilla-Walker & Carlo, 2014). Therefore, treating raters as equivalent, or attributing differences between them as error, may result in the loss of valuable information (see Offord et al., 1996 and Drabick, Gadow, & Loney, 2007 for similar discussion within the psychopathology literature). Perhaps researchers can instead consider capitalizing on informants' access to different behavioral samplings across both specific interpersonal situations, as well as more broadly construed settings (e.g., home, school, online). Incorporating the unique perspectives of raters and cross-situational variability in the behavior could provide a more nuanced understanding of prosociality and enhance the utility of measurement instruments.

Observational Methods

While the rating scales discussed in the previous section often ask informants to provide global judgments (i.e., emphasize overall frequency without explicit reference to interpersonal or situational circumstances), observational procedures, in contrast, provide a significant amount of contextual information. This form of measurement may be attempted with no predetermined behaviors in mind (i.e., the goal is to provide descriptions of behaviors and the context in which they occur) or in a more systematic fashion (i.e., the goal is to measure a specific targeted behavior; Hintze, Volpe, & Shapiro, 2002). The latter typically begins with the development of operational definitions for the behavior of interest, followed by surveillance and recording of a subject performing the behavior within a particular context (Ostrov, Crick, & Keating, 2005). This approach can be further delineated into *naturalistic* (i.e., designed to capture prosocial behavior as and where it normally occurs) or *analogue settings* (i.e., designed to simulate conditions of the natural environment within a highly structured and controlled setting; Fisher & Spencer, 2015; Whitcomb, 2017).

Naturalistic. When definitions of the construct are clearly articulated and interrater reliability is established, naturalistic observational methods are able to provide additional insight into the forms and frequency of prosocial behavior (Iannotti, 1985). For example, using a participant–observation technique, R. S. Zeldin, Small, and Savin-Williams (1982) found individual differences in prosocial behavior were clearly recognized by adolescents after only 4 days and remained stable over 3–

4 weeks. In a more extended time frame, Padilla-Walker, Carlo, Christensen, and Yorgason (2012) examined parent socialization of prosocial behavior over a 1-year period with coded interactive in-home video tasks. By employing both questionnaires and observational ratings, the authors found that behavioral observations showed the most consistent bidirectional relations (when compared to parent and adolescent reports of prosocial behavior). The improved reliability may be attributed to the decreased susceptibility of social desirability demands or the fact that measurement was targeted toward a specific recipient of the prosocial behavior (mother or father), rather than the broader "family" assessed in most parent and adolescent reports.

Analogue. Analogue observation methods (or "situation-specific tests") typically occur in a laboratory but the particular environment developed for the observation is structured to mimic everyday situations. For example, within the school realm, adolescents often witness one another being subjected to negative social experiences (e.g., peer rejection). Taking into consideration that individuals place greater value on maintaining social acceptance during early adolescence, Masten, Eisenberger, Pfeifer, and Dapretto (2010) argued youth subjects would be particularly vulnerable to such experiences. Accordingly, their study examined prosocial responses to victims of peer exclusion (a proxy for peer rejection). After witnessing an observed victim being "ignored" in a triadic ball-toss interaction (Cyberball; Williams, Cheung, & Choi, 2000; Williams et al., 2002), adolescent participants were asked to email them a message about the encounter, which was later evaluated for indicators of prosocial behavior by independent raters. The strengths of this particular study include the design, selection of participants, and choice of instruments. First, the authors clearly articulate why a specific sociocognitive correlate (i.e., empathy) was included and identified its link to a specific form of prosocial behavior (i.e., comforting). Second, the age-range of the sample was intentionally restricted to *early* adolescents (included only 12–13-year-olds), thus narrowing in on a stage *within* adolescent development in which social exclusion may be most consequential. Third, the authors provided the extensive rationale behind the selection of the Cyberball instrument (i.e., previous neuroimaging and behavioral studies have demonstrated its high ecological validity in simulating social exclusion and eliciting feelings of distress and empathy), thereby establishing its alignment with the study's goals; Eisenberger, Gable, & Lieberman, 2007; Eisenberger, Lieberman, & Williams, 2003). And finally, collecting both neural and behavioral responses allowed for convergence of results in a multimethod approach, thus increasing confidence in the overall findings.

Despite the many advantages of both naturalistic and analogue behavioral observation to measure prosocial behavior in youth, each method presents significant challenges. From a practical standpoint, direct behavioral observation typically requires extensive time (e.g., selecting and refining a coding system, training observers, etc.) and may require a large number of observations in multiple settings to ensure reliable and useful measurement. Additionally, there are several potential threats to the validity of observations including observer reactivity and the situational specificity of behavior (i.e., data collected on one occasion might reflect specific situational factors rather than dispositional factors; Furr & Funder, 2007; Whitcomb, 2017). Harnessing technology to collect data in a less visible and/or obtrusive manner may mitigate some of the concerns surrounding observational measurement, but this remains largely unchartered territory in the study of adolescent prosocial behavior.

Future Directions in Observational Methods

The ability to create an effective coding system becomes an arduous task when considering how difficult it is to unscramble prosocial behavior definitions from one another. From an empirical standpoint, it would seem narrowly defining each behavioral domain would make the most sense. However, this may be impractical when it comes time to conduct actual observations. Breaking down the general domain of "prosocial behavior" into, let us say, 10 or more categories will most likely be cumbersome. Conversely, too broad of a description increases the ease of coding, but only at the expense of the observational system's reliability and validity (Epps, 1985). Therefore, the most reasonable approach in determining the scope of the behavioral definition is to directly tie it to the specific study purposes (e.g., if the ultimate goal is to develop an age-appropriate intervention, greater specificity may be required). In cases that require the observational domain to be defined more broadly, researchers are encouraged to employ multiple measures in order to offset the decreased validity (a habit not regularly exercised in studies conducted within the last 20 years—see

Appendix S2 in the online Supporting Information). In the absence of such efforts, researchers may fall into the trap of equating related but qualitatively distinct behaviors (Kent & Foster, 1977; Volpe & McConaughy, 2005).

Additionally, as it stands, the use of direct behavioral observations in investigations with younger children far outnumber those conducted with adolescents and more commonly focus on antisocial behaviors as compared to prosocial behaviors (e.g., Pellegrini & Long, 2002). Even within studies examining prosocial behavior, the categories are often too broad to derive meaningful construct distinctions (e.g., receiving and initiating positive interactions with peers). Perhaps one way to potentially enter into the adolescent world in a less obtrusive manner is to capitalize on the prevalent use of mobile phone technology and employ smartphone-based ecological momentary assessment (e.g., Snippe et al., 2017). Smartphones could prompt answers to behavioral or psychological questions in order to collect data and, perhaps eventually, the development of mobile application-based interventions can serve as a tool to promote prosocial behaviors (e.g., Konrath, 2015; Konrath et al., 2015). With a unique lens aimed at capturing environmental antecedents and behavioral consequences, direct behavioral observation is well positioned to inform intervention planning. Not only are observers able to collect functional data on an individual prosocial behavior, but they are also privy to how it exists within an interactive environment, thus providing a highly ecologically valid approach.

Experimental Design

Since the turn of the millennium, there has been an increase in systematic attempts to examine the external validity of games designed to measure prosociality (Gurven & Winking, 2008; Hill & Gurven, 2004). Economic games, the most common experimental paradigm employed in the study of prosocial behavior, serve as a powerful tool to uncover social preferences and the underlying motivations of prosociality (Fehr & Fischbacher, 2003). The three most common games—the Dictator Game (DG), the Ultimatum Game (UG), and the Public Good Game—are all intended to mimic a number of real-life situations, structured with sequential exchanges between partners in the division of resources. They typically elicit a situation in which behaving in a noncooperative manner yields better personal outcomes than behaving in a collectively desirable way. The underlying assumption is prosocial individuals should behave more prosocially/altruistically than self-interested individuals (Rilling & Sanfey, 2011). The determinants of adolescent prosocial behavior (often in the form of sharing and giving) are then explored through analysis of the decisions involving consequences for others and comparison of outcomes for self (Güroğlu, van den Bos, & Crone, 2014). For example, in one recent study, van Hoorn, van Dijk, Meuswese, Rieffe, and Crone (2014) showed that adolescents were more likely to endorse prosocial behaviors (i.e., donate tokens to a peer group as opposed to holding on to them for themselves) when receiving approval of prosocial behavior from unknown peers (as compared to approval of pro-self behavior or no feedback). In general, most of these study designs, involve subjects receiving stimuli and making decisions at a computer terminal. Not only does this simplify things logistically, but it allows for greater control over the flow of information, thereby reducing relevance of potential confounding factors.

Of course, the downside of increased control in an experimental environment is the framing of interactions within a laboratory setting and the unintended effects it can have on a subject's behavior. Eisenberg and Mussen (1989) note that responses in such contrived settings, particularly with children and adolescents, may reflect the strength of tendencies to conform, rather than predispositions to generosity or altruism. Other researchers have expressed skepticism with regard to the lack of ecological and external validity, questioning the extent to which inferences extend to the larger population (i.e., laboratory experiments with "tokens," hypothetical scenarios that may not reflect everyday patterns of behavior or those that bear little resemblance to the context-rich world in which decisions are made; Chibnik, 2005; Gurven & Winking, 2008). Relatedly, the extent to which specific forms of prosocial behavior being investigated (e.g., giving, sharing) extrapolate to the broader construct is also a concern given prosocial research is progressing toward multidimensionality and requires measurement equipped to capture different types of behavior (see Güroğlu et al., 2014 for an exception in which forms of low- and high-cost prosocial behaviors were examined with different relational targets).

Future Directions in Experimental Design

There is a notable absence of experimental research for adolescent behaviors in general, and for

prosocial behavior in particular. Although this approach offers greater validity in estimating socialization effects and remains the only method that permits causal inferences (de Castro, Thomaes, & Reijntjes, 2015). The limited body of experimental studies in adolescent prosociality may be attributed to perceived difficulties in creating ecologically valid experimental contexts. However, prior studies examining risk-taking behaviors and maladaptive responses have demonstrated the potential utility of this method when attempted (e.g., Cohen & Prinstein, 2006; Gardner & Steinberg, 2005). Therefore, it may be important to explore ways to increase the subtlety of such approaches in the study of positive development outcomes as well.

Although still in the early stages, there have also been interesting examples of studies combining imaging data with experimental designs that are more closely related to real-life prosocial behavior. Functional magnetic resonance imaging (fMRI) has helped identify neural correlates of prosocial behavior and uncovered the similar social brain networks of prosocial behavior and sensitivity to peer influence. With adolescent samples, the presence of peers led to an increase in prosocial behavior (even more so when peers provided prosocial feedback) and in younger adolescents (12–13-year-olds), the effects of peer presence were larger in associated brain regions during donation decisions (Burnett, Bird, Moll, Frith, & Blakemore, 2009; Güroğlu et al., 2014; van Hoorn, van Dijk, Güroğlu, & Crone, 2016). Further examination of outcomes of interest with the simultaneous collection of neural activity may generate key insights related to individual differences in prosocial decisions. This combination of methods allows for multiple objectives to be obtained, including increased understanding of (1) the neural mechanisms of prosocial behavior, (2) how these mechanisms develop and are shaped by experience, and (3) the interpersonal and contextual factors influencing the actual manifestation of the behaviors.

Similarly, in another effort to capitalize on technology, the immersive environment of virtual reality is also gaining traction (e.g., Rosenberg, Baughman, & Bailenson, 2013). These investigations serve as a departure from the more typically studied link between video game violence and aggression. Participants are often asked to "inhabit" or embody an avatar (virtual representation of themselves). Then, researchers are able to examine to what extent prosocial behaviors are performed during the game as well as its ability to facilitate prosocial behavior in the real world (Rosenberg et al., 2013). The unique affordances of virtual environments have yet to be fully leveraged in the study of prosocial behavior despite its potential to address the challenges of maintaining realistic situations within controlled experiments and/or its ability help circumvent difficulties surrounding the lack of replication and the use of nonrepresentative samples in experimental research (Blascovich et al., 2002).

GENERAL CONCERNS AND CONSTRAINTS IN CURRENT MEASUREMENT APPROACHES

Recognizing that no method is without limitations, the summarized "pros" and "cons" of each one emphasizes the value of using a plurality of measurement approaches within a study design (Duckworth & Yeager, 2015). Beyond the aforementioned constraints, however, are several cross-cutting limitations in research on adolescent prosocial behavior. The following subsections take a closer look at three of these shortcomings: (1) the use of retrofitted instruments and assumptions of measurement invariance; (2) examining an incomplete repertoire of prosocial behaviors; and (3) the inclusion of unidentified targets in measurement. Additional recommendations are then proposed with regard to advancing the measurement of prosocial behavior.

Retrofitted Instruments and Assumptions of Measurement Invariance

Of the instruments currently available for application today, only a small subset was explicitly developed to measure prosocial behavior in adolescence (see Appendix S1). More commonly, the instruments serve as subscales within larger measures targeting aggression (e.g., Social Experiences Questionnaire, Children's Behavior Scale and Preschool Behavior Questionnaire) or clinical screening instruments (e.g., Strengths and Difficulties Questionnaire and Skills Rating System; Crick & Grotpeter, 1996; Goodman, 1994, 2001; Gresham & Elliott, 1990; Ladd & Profilet, 1996; Tremblay, Vitaro, Gagnon, Piché, & Royer, 1992). As such, the positive behavior items on these subscales were originally included to add to the variance explained by aggression and psychopathology in predictive studies (Eron & Huesmann, 1984; Tremblay et al., 1992). From a practical standpoint, instrument developers also acknowledge that informants, particularly teachers and mothers, may prefer completing questionnaires focusing attention on both positive and negative behaviors.

Take the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1994, 2001) as an example. Stone et al. (2010) note, "the instrument includes a prosocial scale, which was added to make the assessment more acceptable to respondents" (p. 255). Given these prosocial subscales are included with the purpose of establishing discriminant validity, details of their own reliability and validity within psychometric studies are often overshadowed by lengthier commentary on the (multiple) aggression subscales.

In the same vein, just as prosocial subscales selectively chosen to balance out negatively themed content do not always undergo psychometric re-evaluation, instruments initially designed with a different target age in mind are not always subjected to the necessary scrutiny required to ensure reliability and validity across groups. Several of the most popular adolescent self-report instruments were originally intended for younger samples (e.g., preschool, kindergarten or elementary school-aged children) or older samples (e.g., college students/adults; Caprara & Pastorelli, 1993; Caprara, Steca, Zelli, & Capanna, 2005; Ladd & Profilet, 1996; Weir & Duveen, 1981). And yet the measurement equivalence across age groups is seldom addressed. The Prosocial Tendencies Measure-Revised (PTM-R) is a notable exception as it was originally developed to measure prosocial behavior in college students but was adapted by the authors for assessment of younger adolescents (Carlo, Hausmann, Christiansen, & Randall, 2003). Based on a study of middle and high school students, six subscales assess different dimensions of prosocial behavior (public, anonymous, helping in dire situations, helping in response to high emotions, being compliant, and altruism), to form a composite score of prosocial behavior. The authors also note the pattern of relations among the subscales differ for early adolescence as compared to middle adolescence (Carlo et al., 2003). This falls in line with the general consensus that adolescence unfolds in three distinct stages: *early*, *middle,* and *late,* each marked by the mastery of new social, emotional, and cognitive skills (Blakemore, 2008). However, even with increased recognition of three distinct periods (and their associated implications for cognitive processing and behavior), measurement endeavors often fail to capture these important nuances (Eisenberg & Spinrad, 2014).

Incomplete Repertoire of Prosocial Behaviors

Additional concern regarding the developmental appropriateness of current measurement practices arises when considering the unintended consequence of sweeping multiple behaviors under the all-inclusive term of prosociality. This often results in relying on a small number of representative prosocial behaviors to examine (e.g., sharing, helping, volunteering) and then extrapolating findings to prosocial behavior as a whole. Given several of the instruments employed today were developed in the late 1980s and early 1990s, it may be the case that too little credence has been given to how the opportunities for and diversity of adolescent prosocial behavior has evolved. For example, the reference to the purchase of holiday cards in the Self-Report Altruism Scale ("I have bought 'charity' Christmas cards deliberately because I knew it was a good cause") may be outdated given adolescents are much more likely to rely on computer-mediated communication (e.g., instant messaging, text messages, social network services) for the exchange of greetings. Likewise, with increased access to global positioning services (GPS) on mobile devices, the opportunities to report on "giving directions to a stranger" have probably also been reduced (Rushton, Chrisjohn, & Fekken, 1981).

Recognizing the potential omission of relevant behaviors and keen on gaining insight as to what prosociality looks like through the eyes of contemporary adolescents, Bergin, Talley, and Hamer (2003) conducted a focus group with sixth graders in which participants were asked to generate a list of their most frequently encountered prosocial activities. Interestingly enough, the majority of current instruments do not explicitly capture the top five items: *stands up for others*, *provides emotional support*, *helps others develop skills*, *compliments/encourages*, and *inclusive behaviors*. In contrast, *providing community service*, one of the items mentioned the least by focus group participants, appears in several studies (e.g., Hardy, Dollahite, Johnson, & Christensen, 2014). These findings also point to the utility of consulting directly with the study population in future efforts to examine the incomplete coverage of relevant facets of the construct (see Revisiting Prosocial Behavior from a New Lens for additional discussion on incorporating the adolescent perspective).

With the changes in technology and the upsurge of social media reshaping interpersonal communication, it seems plausible that 15 years later, even the list produced by Bergin et al. (2003) may not be fully exhaustive. Few studies have sought to expand on the repertoire of prosocial behaviors pertinent to adolescent peer

interactions as they unfold on participative Internet communications (i.e., social media) and through electronic communication (e.g., text messages, chatrooms). As such, questions remain unanswered regarding what constitutes prosocial behavior online. What are the low- and high-cost actions that take place on forums like Facebook, Twitter, Instagram, and Snapchat? How much consistency is there between "online" and "real world" displays of prosocial behaviors? These questions and many more point to an important and underexplored area in the study of adolescent prosocial behavior.

Inclusion of Unidentified Targets in Measurement

In continuing to unpack potential sources of measurement ambiguity in the study of prosocial behavior, researchers have also raised concern regarding the employment of nonspecific pronouns when describing prosocial behaviors (e.g., "I am helpful if *someone* is hurt, upset or feeling ill" or "I try to make sad *people* happier") or the omission of a recipient altogether (e.g., "I share things"; Caprara & Pastorelli, 1993; Goodman, 1997; Rigby & Slee, 1993). A growing body of empirical work has uncovered variation in adolescent prosocial behavior as a function of who is on the receiving end of the act. Perhaps expectedly, adolescents are more likely to help friends than any other target (Bartel, 2006; Berndt, 1979; Güroğlu et al., 2014). Even beyond identifying close friendships and family members, prosocial behavior has been found to be influenced by the quality of the relationship dynamics (i.e., frequency of contact, shared history, anticipation of future interactions; Amato, 1990; Lewis, 2014). And while affective quality and frequency of interaction have contributed to the prediction of prosocial behavior among friends (Barry & Wentzel, 2006; Padilla-Walker, Fraser, Black, & Bean, 2015), the parent–child relationship serves as the most salient and consistent predictor of prosocial behavior toward family (Eberly & Montemayor, 1998; Padilla-Walker & Christensen, 2011).

Oddly enough, however, most studies examine interactions of participants with "anonymous others," overlooking the fact that the majority of adolescent social interactions involve individuals they know (for exceptions, see studies drawn from the Flourishing Families *Project* by Padilla-Walker and colleagues in Appendix S2). With accumulating evidence suggesting potential contingencies based on the interaction partner, as well as findings that show performance of prosocial behavior may be determined by both past experiences and the prospect of future interactions (van den Bos, van Dijk, Westenberg, Rombouts, & Crone, 2011), it is important to build on the knowledge base of known targets.

RECOMMENDATIONS MOVING FORWARD

The issues described both within and across methods draw attention to various potential steps that may allow for more nuanced and rigorous measurement of adolescent prosocial behavior including (1) increasing focus on sound conceptual specification of prosocial behavior and its dimensions prior to fitting the construct to explanatory models; (2) testing for conceptual and psychometric equivalence; (3) broadening the scope of current measurement practices; and (4) providing greater consideration of nontraditional strategies that may amplify youth voice.

Conceptual Specification of Prosocial Behavior

The challenges surrounding the lack of consensus in construct definition must be addressed in order to sidestep both the *déjà-variable* phenomenon (i.e., variables with similar definitions and content referred to by different terms), as well as the *jingle fallacy* (i.e., the same term used for constructs with different definitions and content; Block, 1995; Hagger, 2014). This will require greater intentionality in defining the relationship between the multidimensional construct of prosocial behavior and its dimensions, rather than making conceptual arguments at the dimension level but proposing specific hypotheses at the construct level. In other words, when a researcher finds support for *sharing*, as an example, in a hypothesized relationship between prosocial behavior and another construct, the extent to which the results can generalize from the dimension level to the construct level will depend on how the prosocial behavior is defined (Wong, Law, & Huang, 2008).

Similarly, greater transparency when reporting findings regarding the decision rules employed to determine which behaviors display sufficient similarity to permit assignment to a common category may also help in moving away from current definitions suggesting a flat, unidimensional approach and toward recognition of separate components with unique qualities and general commonalities. This also avoids the risk of

"loose" definitions yielding multiple (distinct) interpretations by respondents who may not align with the intended goal of the investigator(s). For example, if an item solicits a subject's ability to "care for others," a parent may interpret this as the adolescent's propensity to provide emotional support to friends in distress, whereas a teacher may refer to the adolescent's compliance to a request asking them to provide academic support to a peer. If an investigator is attempting to tap into the relationship between empathy and prosocial behavior, the teacher's rating may not be as relevant. Therefore, with increased specificity and greater clarity in construct definitions, each of the described approaches will stand a greater chance of addressing the associated measurement challenges.

Testing for Conceptual and Psychometric Equivalence

Often overlooked, current assessments are not properly shielded from the likelihood of response bias due to group differences (e.g., age, gender, culture) in cognitive processes operating during assessment. Although researchers have not converged on a single approach for definitively assessing measurement equivalence, the most commonly used strategy involves testing for cross-group invariance of an instrument's factorial structure with structural equation modeling (Putnick & Bornstein, 2016). This allows for data equivalence to be examined at various levels of abstraction which are broadly grouped under the categories of *conceptual* equivalence (i.e., extent to which a construct has the same meaning across groups) and *psychometric* equivalence (i.e., comparable psychometric properties including reliability and validity; Hughes, Seidman, & Williams, 1993; Hui & Triandis, 1985; Meredith, 1993; van de Schoot, Lugtig, & Hox, 2012). Taken together, these forms of data equivalence represent requisite building blocks necessary for cross-age or cross-gender comparative research, yet the majority of studies presume universality of meaning and generalizability of measurement instrumentation. To address this, future studies may need to prioritize the establishment of measurement equivalence in instruments employed; otherwise, if a measure is not assessing the same construct (or is not assessing the construct in the same manner) in different groups, the inferences drawn are at best ambiguous, and at worst biased (Borsboom, 2006; Putnick & Bornstein, 2016; van de Vijver, 2007).

Broadening the Scope of Current Measurement Practices

Generating a pros and cons list of each measurement approach in the previous section was not done with the intention of advocating the use of one over another, but rather to provide a helpful guide for the design of studies intending to measure adolescent prosocial behavior (see Figure 1 for an instrument selection guide adapted from youth bullying literature). For example, to understand whether a departure from norms has occurred, behavioral ratings offer information from respondents in an appropriate referent group to rate the behavior. In contrast, to address the form and frequency of particular subtypes of prosocial behavior within a particular context (e.g., school), an observation coding system may provide key insight.

In general, there has been a greater reliance on self-reports and behavioral ratings, with limited attempts at observational methods or experimentally controlled settings in the study of adolescent prosocial behavior. This may be due to the challenges that arise when attempting to collect unobtrusive data with adolescents. However, within a single school day, these students engage with multiple targets (e.g., classmates, friends, teachers, administrators) in varying situations (e.g., structured nature of the classroom, less structured nature of recess/lunch/free periods) that could help corroborate and/or expand on findings drawn from self-reports or behavioral ratings (Whitcomb, 2017; S. R. Zeldin et al., 1984). Similarly, experimental designs offer a more covert approach than studies employing scenarios and provide a unique opportunity to elicit actual prosocial behaviors (as opposed to ratings). With the manipulation afforded by such designs, researchers may be able to delve further into research aimed at uncovering who within peer groups may be particularly influential on an adolescent's prosocial behavior. Accordingly, researchers are encouraged to strategically "mix and match" both current and new forms of measurement, capitalizing on strengths and counteracting weaknesses of each approach, as they all can individually (and collectively) contribute to sound measurement of the construct. Inevitably, an investigator arrives at the "best choice" (of measurement) based on theoretical orientation, the study hypotheses, preferences and expertise in selected methods, and availability of resources. But our understanding of adolescent prosocial behavior could still benefit from more candid discussions regarding the relevance of a

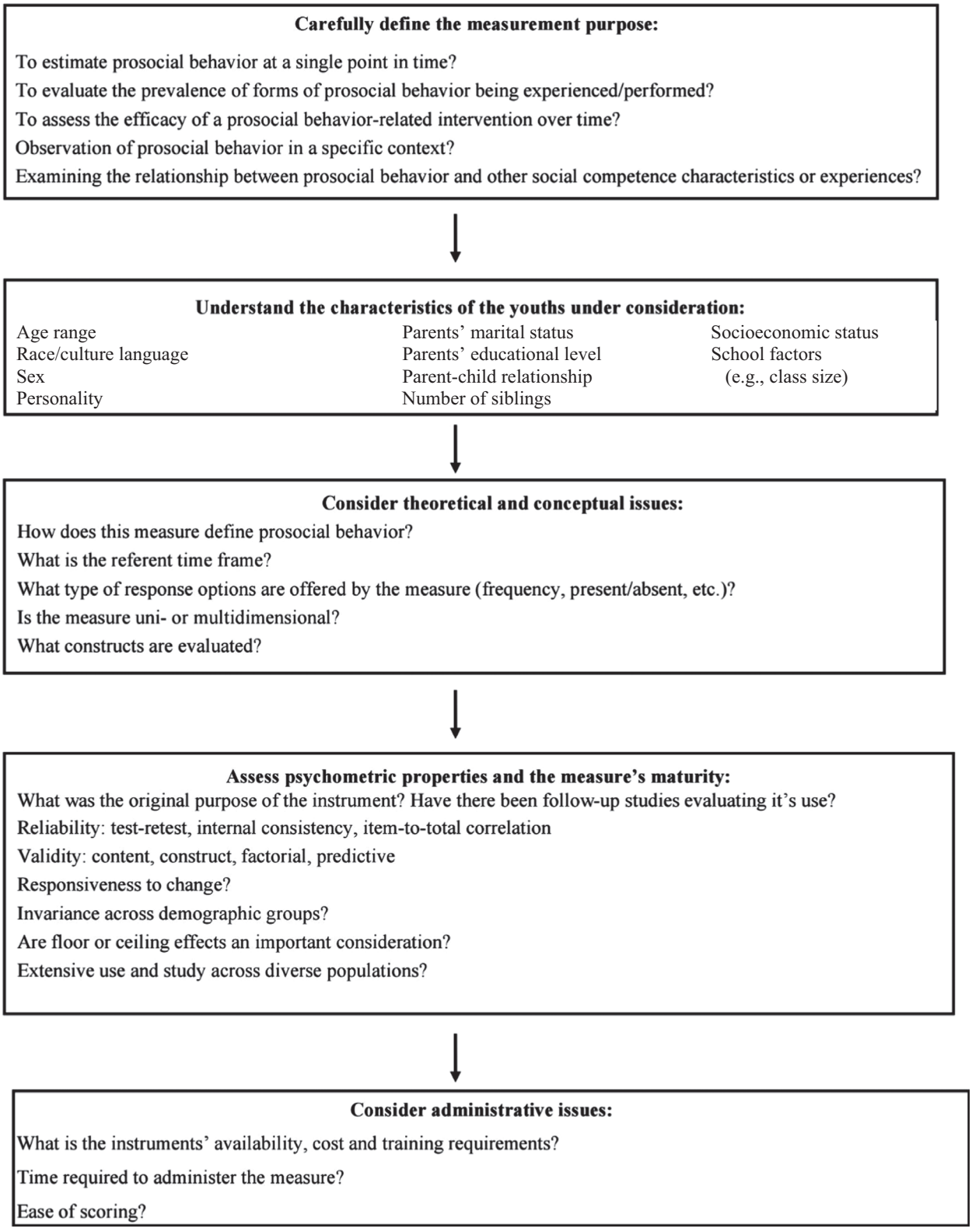

FIGURE 1 Guide to prosocial behavior instrument selection (adapted from youth bullying literature; Vessey, Strout, DiFazio, & Walker, 2014)

method of measurement choice, the rationale behind its selection, and the specific ways it ties back to the stated research goals.

Revisiting Adolescent Prosocial Behavior From a New Lens

Without an "insiders" perspective (in this case, adolescents), it becomes difficult to gauge the degree to which tools or assessment devices adequately measure their intended constructs (Haynes, Richard, & Kubany, 1995). Recognizing that the growing body of knowledge on social development in children and adolescents has largely been shaped by adult-centric frameworks that employ a deductive conceptual approach, the call has grown louder for innovative ways to take into account relevant viewpoints (Camino, 2000; Mirra, Garcia, & Morrell, 2016; Ozer, 2016). Two promising approaches to assess lay conceptions of prosocial behavior are *prototype analysis* and *participatory research methods*. Both of these are a departure from the more common inductive data-driven and deductive theory-driven approaches that typically offer complimentary insight in the development of prosocial behavior indicators. Instead, they lean more heavily on lay conceptions of the construct.

Prototype analysis has been found to be particularly well suited in investigating multidimensional constructs as it involves "flagging *central* features rather than identifying *critical* features" (Kearns & Fincham, 2004, p. 840). In other words, whereas the classical view of concept definition uses a set of criterial attributes, the prototype perspective aims to better understand how individuals outside the research community conceptualize and experience the construct of interest (Rosch, 1975). This process typically involves participants freely listing all features they associate with a target construct and then rank-ordering them according to centrality to the construct. The utility of prototype theory has previously been demonstrated in the development of personality scales (Broughton, 1984), as well as providing insights into complex psychological constructs such as *love* (Fehr, 1988), *romantic jealousy* (Sharpsteen, 1993), *relationship quality* (Hassebrauck, 1997), *forgiveness* (Kearns & Fincham, 2004), *gratitude* (Lambert, Graham, & Fincham, 2009), and even defining a *good person* (Smith, Smith, & Christopher, 2007).

Similarly, participatory methodology, described as an orientation to inquiry (as opposed to its own concrete research method), argues in favor of "the possibility, the significance and the usefulness of involving research partners in the knowledge-production process" (Bergold & Thomas, 2012, p. 191). In general, participatory methods are employed with the intention to validate the knowledge of the target population and offer opportunities for their direct engagement with issues under study (Rodríguez & Brown, 2009). Including the "missing voice" of adolescents at various stages of the research process (e.g., instrument development, instrument adaptation), may provide key insight regarding the developmental appropriateness and relevance of the measurement under question (e.g., whether items are interpreted as intended, the extent to which observational codes are deemed relevant by adolescents, etc.).

To sum, as researchers continue to grapple with discrepancies in the definition and operationalization of prosocial behavior, it may be useful and timely to investigate alignment between real-world and academic understandings of the construct. As previously mentioned, the vast majority of research on adolescent prosocial behavior is based on self-reports and behavioral ratings, and therefore ascertaining lay perspectives may facilitate the development or refinement of such measures. Furthermore, the extent to which lay definitions correspond to theoretical conceptualizations is an empirical question that can and should be answered.

CONCLUDING REMARKS

The past four decades have produced a notable surge in research studies uncovering the positive implications of prosociality with regard to social-psychological adjustment outcomes and later achievement (Caprara et al., 2000; Layous, Nelson, Oberle, Schonert-Reichl, & Lyubomirsky, 2012; Weinstein & Ryan, 2010). Review of common measurement practices, however, reveals the relatively limited evaluation of psychometric properties conducted on currently available tools, as well as the potential benefits that stand to be gained in both expanding the range of frequently used methods and considering the integration of innovative, non-traditional approaches. Toward this end, several small steps can be taken to attain more nuanced and rigorous measurement. Prioritizing more in-depth psychometric examinations of available instruments (particularly with regard to construct invariance) may elucidate the extent to which particular measures tap into the targeted construct, the level of inference that can be drawn from data, and potential areas that may benefit from refinement (e.g., individual items, response formats, instructions, observation codes, time-sampling

parameters, observational situations; Haynes et al., 1995). By the same token, increasing focus on lay conceptualizations of prosocial behavior may assist in drawing attention to specific behaviors that are currently omitted from measurement, facilitate identification of necessary modifications to the construct's measurement, or further inform decision making in the selection of measurement tools. Therefore, by shedding light on the conceptual and psychometric limitations found in the study of prosocial behavior, the hope is to spur further discussion and innovative research on these topics.

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Supporting Information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Appendix S1. Measures Used in the Study of Adolescent Prosocial Behavior (1995–2016)
Appendix S2. Studies Conducted Between 1995 and 2016 Measuring Adolescent Prosocial Behavior
Appendix S3. References for Appendix S1
Appendix S4. References for Appendix S2