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Chapter 2

Conceptualizing and Measuring Popularity

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This chapter reviews the measurement of popularity in research with children and adolescents. As indicated in the previous chapter, the study of popularity has roots in both quantitative and qualitative approaches. This chapter focuses on quantitative methods, but qualitative approaches are also briefly reviewed. Specifically, we discuss sociometric measures (peer nominations or ratings) of popularity but also address alternative measures, such as self-ratings, teacher ratings, and observational methods. In addition, some researchers have used mixed-methods approaches—for example, LaFontana and Cillessen (2002) collected answers to open-ended essay questions that were later content coded for quantitative analyses (see also de Bruyn & Cillessen, 2006b; Xie, Li, Boucher, Hutchins, & Cairns, 2006)—and we discuss these studies here as well.

As popularity is becoming a more popular topic (an unavoidable expression) in the peer relations literature, there is a clear need for consistent terminology. A recurrent observation in this book is that researchers have used inconsistent terms for popularity and related constructs. An important goal of this chapter is to propose a clear and consistent use of terms. Toward this end, we review the distinction between two forms of high status in the peer group—likeability and popularity—and the labels

used for them. We then propose a standardized terminology for use by researchers.

WHAT IS POPULARITY?

Bukowski (Chapter 1, this volume) presented a broad conceptual analysis of the origin of the word *popularity*. This analysis shows that the roots of the term *popularity* are diverse and its meanings complex. The goal of the current chapter is narrower and limited to the measurement practices across the empirical literature. We focus on the practice of measuring popularity as a psychological construct in the child and adolescent peer relationships literature.

As indicated by Bukowski (Chapter 1, this volume), popularity in this narrow sense in the developmental literature has typically referred to the rank ordering of children or adolescents in their peer groups (classroom or grade) according to a criterion of hierarchy or status (a positive criterion or desirable trait). Those at the top of the rank ordering have been labeled “popular.” This practice has been followed for the past 75 years in a large number of studies. Many of these studies dealt directly with popularity; in others, the identification of popular students was a by-product of a focus on other dimensions of peer status, usually peer rejection. This body of research, and especially the data collected over the past 10 years, reveals multiple ways of measuring popularity that are indicators of different underlying constructs.

The heterogeneity of the empirical construct of popularity can be illustrated by a comparison to the construct of attractiveness. Research in social psychology has shown consistently that people who are considered physically attractive or beautiful are evaluated positively, even when their behavior is not positive. A favorite expression summarizing this body of research is “What is beautiful is good” (see Webster & Driskell, 1983). Does this also apply to popularity? Is what is popular also always good? Both anecdotal expressions and research evidence indicate that the positivity bias that exists for attractiveness does not necessarily exist for popularity. Unlike for beauty, what is popular is not always good.

In the anecdotal domain, Abraham Lincoln is quoted to have said “Avoid popularity if you will have peace,” already pointing to the fact that popularity is a mixed blessing. Perhaps Lincoln was referring to the heavy responsibilities that came with his position of high (elected) status or to the envies and enmities that came along with it. Oscar Wilde said, “Whatever is popular is wrong.” He referred to art, taking the elitist stand

that what is liked by everyone cannot necessarily be good. More recently, Yogi Berra has said, “Whoever is popular is bound to be disliked”—wisdom with a close connection to the child and especially adolescent peer group, as we will discuss later. This mixed nature of popularity as a psychological construct is also illustrated by several movies that have shown the dark side of adolescent popularity, particularly among girls (see, e.g., *Mean Girls* and *Heathers*).

Taking these anecdotal illustrations into the empirical domain, studies with children and adolescents have shown that popularity is associated with some negative behaviors and outcomes. Whereas being liked by peers is negatively associated with being aggressive, popularity has a consistent positive association with measures of aggression, in particular social or relational aggression, that is, aggression that is manipulative or excluding (e.g., Cillessen & Mayeux, 2004; Cillessen & Rose, 2005; Rose, Swenson, & Waller, 2004; see also Mayeux, Houser, & Dyches, Chapter 4, this volume). Furthermore, popularity is positively associated with health risk behaviors such as smoking, drinking, and early sexual activity in adolescence (Mayeux, Sandstrom, & Cillessen, 2008; see also Schwartz & Gorman, Chapter 11, this volume). Thus, the anecdotal perception of popularity as a mixed bag is confirmed by empirical data in the child and adolescent literature. This chapter considers the measures of this dual-natured construct.

TWO TYPES OF POPULARITY

Sociometric methods are the methods used to assess peer status in classrooms and schools. Sociometric methods have a long and varied history (see, for reviews, Cillessen, 2009; Cillessen & Bukowski, 2000; Moreno, 1960) dating back originally to Moreno (1934). In the 1980s, Coie and colleagues developed a standard sociometric procedure and a method of classifying of children into sociometric status groups. This procedure was subsequently used rather consistently in research for over two decades. Often referred to as the Coie, Dodge, and Coppotelli (1982) method, it is generally used as described in their article.

In the Coie et al. (1982) procedure, participants are asked to nominate peers in the reference group (classroom or grade) who they like most and like least. Nominations received for both categories are then counted for each participant, resulting in scores on four continuous sociometric dimensions: acceptance, rejection, (social) preference, and (social) impact. *Acceptance* is the number of “liked most” nominations received.

Rejection is the number of “liked least” nominations received. *Preference* is the acceptance score minus the rejection score. *Impact* is the sum of the acceptance and rejection scores. As part of the procedure, these scores are standardized within the reference group to control for differences in classroom or grade size. Using specific cutoffs (often $\pm 1 SD$), each participant is then assigned to one of five sociometric status types: “*popular*” (high preference; liked by many, disliked by few), *rejected* (low preference; disliked by many, liked by few), *neglected* (low impact; neither liked nor disliked), *controversial* (high impact; liked by some and disliked by others), and *average* (average on all four dimensions). In this chapter, we refer to these groups as the “traditional sociometric status categories.”

This classification system formed the basis of much research in the 1980s and 1990s. The majority of this research focused on children or adolescents with problematic peer relations, in particular those who were classified as rejected. From these investigations, much was learned about the correlates, precursors, and consequences of peer rejection (see, for reviews, Asher & Coie, 1990; Bierman, 2004). There was not much interest in popularity during this time; the major interest of developmental and child clinical researchers was aggression and rejection. The zeitgeist was to focus on children with problems in the behavioral and relationship domains and to design and test successful methods of preventing these problems. There was an anecdotal awareness that the sociometric “popular” classification, especially among elementary schoolchildren, was not the same as one’s personal experiences with adolescent popularity in high school, but this was not the focus of systematic research interest.

This changed in the late 1990s, when researchers began to include “most popular” and “least popular” nominations in sociometric data collections in addition to the traditional “liked most” and “liked least” nominations (e.g., LaFontana & Cillessen, 1999; Parkhurst & Hopmeyer, 1998), thereby adding *popularity* as a fifth sociometric dimension to the already existing four (acceptance, rejection, preference, impact). Popularity is determined as the (standardized) number of “most popular” nominations received, or the difference between the number of “most popular” and “least popular” nominations (popularity minus unpopularity nominations). It is important to emphasize that popularity is a different dimension than acceptance or preference. Acceptance and preference are dimensions of likeability, derived from peer nominations of who is most and least liked. Popularity is a dimension of power, prestige, or visibility, derived from nominations of who is most and least popular. In that sense, popularity is conceptually closer to the traditional sociometric dimension of social impact defined previously as the sum of “liked most” and “liked

least” nominations received, which is also an indicator of how socially visible someone is in a group, irrespective of the valence of the behavior that attracts others’ attention.

TERMINOLOGICAL CLARIFICATION

Historical Perspective: Acceptance as Popularity

In the early sociometric literature, the terms *popularity* and *acceptance* were often used interchangeably. For example, in her classic study in the first volume of *Child Development*, Koch (1933) used the term *popularity* but measured acceptance. Indeed, a general difficulty in considering popularity research from a historical perspective is the use of the term *popularity* as a synonym for *acceptance* or *social preference*. The confounding of these terms actually began before the introduction of sociometry itself (e.g., Koch, 1933; Voigt, 1933; Watson, 1927), despite contemporary accounts indicating that popular children were not necessarily the best liked (Boorman, 1931; Hermans, 1931; Jennings, 1937; Tryon, 1939). By the second half of the 20th century, researchers regularly used *popularity* for acceptance nominations (Polansky, Lippitt, & Redl, 1950; see also Coleman, 1961; Dunnington, 1957). The mixing of terms continued after the introduction of the traditional sociometric status types, in which the label *popular* became a synonym for the highly accepted group.

Toward Terminological Clarification

As indicated previously, status in the peer group can be measured in one of two ways. One is by means of the traditional sociometric categories: popular (meaning highly accepted or preferred in the peer group), rejected, neglected, controversial, and average (Coie et al., 1982). This classification was most frequently used in the peer relations literature in the 1980s and 1990s. The second involves using continuous scores for acceptance, preference, impact, and, more recently, (perceived) popularity. Terminological confusion has emerged because the term *popularity* appears in both systems but has a different meaning in each. In the traditional sociometric status types, the term refers to children or adolescents who are particularly well liked in the peer group. Because this system was originally designed for elementary school samples in which popularity and likeability are positively correlated, using the term *popular* for this group seemed logical (Coie et al., 1982; Newcomb & Bukowski, 1983). However, popularity (usually obtained by asking students to name who is

most and least popular) is not a measure of likeability or preference but rather a measure of prestige or visibility.

Parkhurst and Hopmeyer (1998) proposed the terms *sociometric* or *perceived popularity* as the solution to this problem. There are, however, disadvantages to this proposal. First, these terms are somewhat clumsy to use. It is awkward to always have to qualify the term *popular* with either the “sociometric” or “perceived” prefix, although it has been done now in a number of studies. Second, perceived popularity is also most commonly assessed with a sociometric method (peer nominations or ratings). To suggest that “perceived” is not “sociometric” is confusing as well, when sociometric methods are used to assess both. Alternative terms for perceived popularity have also been proposed, such as *judgmental popularity* (Babad, 2001), *reputational popularity* (Prinstein & Cillessen, 2003), and *consensual popularity* (de Bruyn & Cillessen, 2006a). Such terms, however, do not solve the somewhat problematic use of the term *sociometric popularity*. Thus, a clarification of terms is still needed.

The implications of the terminological confusion between both forms of popularity are larger for the study of adolescent peer relationships than for the study of children because the distinction between likeability and popularity is clearer in adolescence than in childhood (Cillessen & Borch, 2006; Cillessen & Mayeux, 2004). One might roughly think of “sociometric” popularity, or *popular as accepted*, as the childhood definition of popularity and “perceived” popularity, or *popular as popular*, as the adolescent definition of popularity. In children’s elementary school classrooms, *popular* generally means “well liked by peers.” In adolescents’ middle and high school grades, *popular* refers to being visible and prestigious.

Thus, the term *popular* can have two different meanings. It can refer to being well liked and accepted (“sociometrically” popular) or to high status as a result of *being seen as* popular and high ranking (“perceived” popular). Sociometric popularity is the result of individual judgments of likeability. Moreno (1934) called them “emotional” judgments: an individual’s private sentiments of attraction or repulsion about another that are not necessarily shared with the group or by the group. The resulting likeability scores (acceptance or preference) in a sociometric assessment are composites of these sentiments. If many participants in a classroom or grade nominate a certain peer as someone they like (and not as someone they dislike), this person is well accepted or highly preferred in this group. This is a summary or composite of individual liking and disliking judgments rather than a consensus that is explicitly communicated or discussed in the group. “Perceived” popularity, on the other hand, is a

reputation. Popularity judgments are not private sentiments but rather reputational judgments. They are not summaries of personal attractions or repulsions; they are a general consensus of who is most popular and least popular as seen by everyone in the peer group.

Because acceptance and popularity have such different meanings, they should be discussed carefully by researchers. In particular, referring to accepted children and adolescents as popular is problematic. Therefore, we propose a system of clear, unambiguous terminology. The construct that has sometimes been referred to as *sociometric popularity* should be called *acceptance* or *preference* (depending on how it is measured) and could be referred to as *likeability*. Likewise, the dimension of social standing that has been labeled *perceived popularity* should simply be called *popularity*, measured by either “most popular” nominations, “most popular” minus “least popular” nominations, or popularity ratings. The chapters in this book consistently use this nomenclature. Additionally, we propose that the “popular” group in the traditional sociometric classification system should be relabeled as “accepted” or “preferred” when discussing past findings of this system or when using it in future research.

THE MEASUREMENT OF POPULARITY

The uniqueness of the popularity construct can be further illustrated and strengthened by reviewing its measurement in research. Both qualitative and quantitative research is discussed.

Qualitative Research

Qualitative researchers have a long history of studying adolescent status (e.g., Folsom, 1934; Waller, 1937) and related constructs (e.g., cliques and subcultural peer groupings; see Buff, 1970; Gordon, 1957; Hollingshead, 1949; Larkin, 1979). James Coleman’s 1961 “The Adolescent Society,” which married questionnaire-derived quantitative information with qualitative interview data, was a particularly notable study of peer status, and it set the stage for a sociological focus on adolescent culture over the subsequent two decades. It was not until the mid-1980s, however, that researchers began explicitly to focus on popularity itself. Early reports by Eder (1985) and Canaan (1987) gave rise to detailed ethnographic explorations of the place of status and popularity within childhood and adolescent peer groups (e.g., Adler & Adler, 1998; Eder, 1995; Milner,

2004), supplemented by more focused reports considering popularity in relation to such topics as cigarette smoking (Michell & Amos, 1997), linguistic construction of identity (Eckert, 2000), and relational aggression (Currie, Kelly, & Pomerantz, 2007). As popularity has become central in quantitative research on peer relationships, the past decade has also seen an upswing in the number of qualitative studies on the impact and construction of popularity among children and adolescents. It would be inaccurate to say, however, that qualitative research *followed* quantitative research. Indeed, the qualitative literature has often anticipated findings of the quantitative literature, the most notable example being Eder's (1985, 1995) observation that the popular students in her sample were not at all the best liked, a claim that was later supported by quantitative research.

Quantitative Research

Most recent studies on popularity have used peer nominations or ratings as the measures of popularity. As with research on peer relationships in general, the peer perspective is considered the gold standard for assessments of popularity. Alternative measures that do not use the peer group are discussed separately next.

Popularity Nominations

The most common method of measuring popularity is simply to ask members of a school classroom or grade to nominate their peers who are most and least popular. Nominations received are then counted and standardized as indicated previously. Several studies have used this approach in determining both popularity and acceptance (e.g., Cillessen & Mayeux, 2004). An implication of this approach is that four peer nominations should be used: liked most, liked least, most popular, and least popular. The inclusion of all four nominations is ideal for sociometric studies on popularity, primarily because it allows researchers to control for the statistical overlap between the two forms of status (which can be substantial, particularly in childhood) in the analysis of their data. The reasons to include both positive (most popular) and negative (least popular) nominations in this research are discussed next.

Popularity Ratings

In sociometric studies conducted in the 1970s and 1980s, the use of likeability ratings instead of nominations, or in combination with

nominations, was common (e.g., Asher, Singleton, Tinsley, & Hymel, 1979). Nominations are a method of partial rank ordering in which the participant only identifies her or his top choices for a criterion and leaves all other (unnamed) peers unranked. Ratings have the advantage that each peer is evaluated explicitly (rated) rather than given no rating by default if not named. Ratings, however, are more time consuming to collect.

A few recent studies in the peer relations literature have used peer ratings of popularity (instead of or in addition to likeability ratings). In these studies, the classroom was the reference group. For example, van den Berg (2009) and Pennings (2009) collected popularity ratings, as well as most and least popular nominations, in grades 5 and 6 at three times during one school year. Peer ratings of popularity were highly stable in this study and positively correlated with popularity nominations. An advantage of ratings is that they can be used to divide the variance in peer judgments into actor, partner, and dyadic components (Malloy, Albright, & Scarpati, 2007; van den Berg, 2009), which is more difficult with nominations (see also Kenny, Kashy, & Cook, 2006). The balance between the longer time needed to collect peer ratings and their additional analytic possibilities will vary by study, but in general popularity ratings are a useful complement to nominations (see, e.g., Schwartz, Gorman, Nakamoto, & McKay, 2006).

Subsets of the Voter Population

Cillessen (2009) defined the voter population in a sociometric study as the collection of children or adolescents in a classroom or grade who participate as voters in a sociometric assessment. In general, the percentage of students in a classroom or grade who participate as voters should be high. Ideally, all students who can be voted for also participate as voters (i.e., the voter population is 100% of the votee population), but in practice this is seldom the case because of absenteeism or lack of parental consent. If the goal of a study is to determine social acceptance or preference or to classify students into the traditional sociometric status types, voter participation should be high (60–70%, with higher participation rates more important in studies using limited nominations). If the goal of a study is to assess popularity, the situation is slightly different. Popularity is a reputation, and reputations can be reliably assessed by subsets of the entire peer group.

Capitalizing on this principle, some researchers have assessed popularity using sociometric procedures with a subset of the peer group act-

ing as voters. For example, Hopmeyer, Kim, and Schimmelbusch (2002) collected popularity judgments from random subsets of the peer group in middle school. Prinstein (2007) used teacher-identified “sociometric experts” (i.e., students who were very aware of classroom social processes) to approximate judgments of the entire group (see also Angold et al., 1990). Given that the results of such studies are very similar to those of studies using full-group assessments, using subsets of the peer group appears to be a reliable method of measuring popularity.

Group Classifications

Peer nominations or ratings yield continuous scores for popularity. However, some researchers prefer to work with subgroups or classifications for analytic or applied purposes. As indicated previously, in traditional sociometric research, there are agreed-upon decision rules to classify students into the sociometric status types *accepted* (formerly known as *popular*), *rejected*, *neglected*, *controversial*, and *average*, as derived from “liked most” and “liked least” nominations. However, there is no analogous procedure to classify children or adolescents as popular, based on most “popular” and “least popular” nominations. The simplest approach so far has been to classify students as popular when they score 1 *SD* above the mean on a continuous score for popularity and to classify all other students as “not popular” (e.g., de Bruyn & Cillessen, 2006a). Others have created subgroups based on teacher ratings (e.g., Rodkin, Farmer, Pearl, & Van Acker, 2000) or derived groups empirically using cluster analysis (e.g., Lease, Musgrove, & Axelrod, 2002). One challenge is to develop a standard way of creating popularity subgroups, so that classifications can be compared between studies.

Alternative Peer (Sociometric) Measures

There are two sources of terminological confusion surrounding the popularity construct. The first is the use of *popularity* for measures of likeability such as acceptance, preference, or desired peer affiliation. The second is the use of *popularity* for constructs that tap into some aspect of social visibility or power, such as admiration, attractiveness, coolness, dominance, network centrality, or perceived peer affiliation. These latter constructs have a theoretical connection to popularity but are not measures of popularity themselves. In each of these cases, only peer nominations or ratings that directly assess popularity should be called “popularity.” Measures of other constructs should be carefully labeled to best repre-

sent the constructs that they tap into. Doing otherwise would perpetuate unclarity regarding the popularity construct.

Acceptance, Preference, Likeability

In part because of the historical labeling of social acceptance as “popularity,” a number of studies of social acceptance have been published in recent years that contain the misleading use of the term *popularity*. Consumers of peer status research must take care not to interpret the results of a study of acceptance as having implications for popularity. Similarly, some studies have used alternative peer nomination items that have not always been labeled clearly as measures of acceptance or popularity. For example, Franzoi, Davis, and Vasquez-Suson (1994) asked high school students to identify the peers in their school “they wanted to hang out with on a Saturday night” and those “they did not want to hang out with on a Saturday night.” Because this item asks participants to indicate a personal choice, or *preference*, for a peer, it falls into the category of what Moreno (1934) calls an affiliative or emotional judgment and thus is a measure of acceptance, preference, or likeability. Franzoi et al. (1994) used the nominations received for both questions to classify students into the five traditional sociometric status groups using the exact criteria of Coie et al. (1982). The popular group in their study thus consisted of students who were highly preferred by their peers and should be called “accepted” instead of “popular.”

Similar confounds between acceptance and popularity are frequent in the peer relationships literature and highlight the need to be very clear about measures and terms. It should also be noted that researchers might be tempted to use the Coie et al. (1982) controversial classification as a proxy for popularity nominations. This makes some conceptual sense; controversial individuals, like popular individuals, are liked by some peers and disliked by others and show a combination of positive and negative behaviors/traits (Cillessen, 2009). However, research comparing controversial adolescents with those high in popularity has shown only moderate overlap between these categories (e.g., LaFontana & Cillessen, 1999).

Social Network Centrality

Peer nominations for “best friend,” “who you hang around with,” and even “like most” can be used as the input for a social network analysis. Common methods use a matrix of dyadic best friend choices to determine

the centrality of each member of the social network as well as information about particular group structures and subgroup memberships. For popularity research, network data are highly valuable in identifying subgroups of popular peers and in fully understanding an individual's place within the social network. For example, a common measure of individual centrality in the social network, the Bonacich (1987) index, depends on the number of other network members one is connected to as well as on the centrality of those peers. A child or adolescent with ties to many peers who are themselves highly connected is considered socially central.

Conceptually, the construct of social network centrality has much overlap with the construct of popularity. Popular adolescents, for example, are often described as influential or socially central in their peer group or grade. Indeed, Cillessen and Borch (2006) found a high correlation between popularity derived from most "popular" and "least popular" nominations and the Bonacich centrality index based on best friend choices in middle and high school grades.

The conceptual and empirical overlap may lead researchers to use network centrality as an alternative or proxy for popularity or even to simply equate one with the other. We caution against this practice. Although the correlation between centrality and popularity is high, the difference between both constructs becomes clearly visible when their stabilities over time are considered. Specifically, whereas popularity is highly stable, even across school transitions (e.g., Cillessen & Mayeux, 2004), centrality is much more dependent on the consistency of the reference group (because it is based on dyadic ties) and, therefore, shows much lower stability (Cillessen & Borch, 2006). Thus, although social network centrality and popularity are related theoretically and empirically, they are not identical. Indices of social network centrality should not be called measures of popularity.

Other Alternative Constructs

Still other approaches to measuring status have been used in the peer relations literature, further muddying the waters and making straightforward conclusions difficult. For example, some researchers have asked students to name peers in their classroom for the sociometric criterion "someone who everyone wants to hang out with" (see LaFontana & Cillessen, 1998). This is a measure of perceived peer affiliation, and not a direct measure of popularity. A key distinction between measures of acceptance and popularity is that the former is based on individual feelings, whereas the latter is measuring an individual's assessment of the group consensus.

Although such a question is not an assessment of popularity, it is also not a direct measure of preference because it is asking participants to report on group attitudes. LaFontana and Cillessen (1998) examined the overlap of direct measures of acceptance and popularity with such indirect measures as “liked by everyone” and showed that these are related, but not identical, constructs.

In other examples, researchers have used peer nominations of admiration or coolness as stand-ins for measures of popularity. Indeed, being admired and being cool have been named as characteristics of popularity in open-ended studies in which adolescents were asked to describe popular peers (LaFontana & Cillessen, 2002; Xie et al., 2006), and being seen as cool and dressing “hip” are correlates of popularity (de Bruyn & Cillessen, 2006b). Yet care should be taken to equate single indicators of popularity, such as admiration, coolness, or being fashionable, with the overall construct itself. Similarly, popularity has sometimes been equated with membership in crowds or cliques with certain characteristics (see Brown, Chapter 8, this volume). Here, too, membership to a certain group is not the same as the popularity status of the individual.

ADDITIONAL METHODOLOGICAL ISSUES

In addition to making sure that one is indeed measuring popularity and not another (albeit related) construct, several other methodological issues are worth discussing. In this section, we address four methodological issues relevant to peer-based measures of popularity. The first is whether a definition of popularity should be provided to participants when peer nominations or ratings of popularity are solicited. The second is whether positive nominations should be used alone or in combination with negative nominations (e.g., “least popular”). The third issue is whether nominations should be collected within gender or also across gender. The fourth point addresses limited versus unlimited nominations.

Definition of Popularity

Occasionally, researchers question whether children or adolescents should be given a standard definition of popularity when making popularity nominations. The situation is sometimes compared with research on bullying, where giving a standard definition of bullying is a requirement for the use of certain instruments, such as the Olweus (1996) Bully/Victim Questionnaire. In sociometric research using peer nominations, elabo-

rate descriptions of the terms are typically not given. Coie et al. (1982) provided short descriptive labels of some of the constructs they measured (e.g., “Leaders and good to have in charge,” “Starts fights and picks on other people”), but in most sociometric studies descriptors of behaviors are usually short or absent altogether, capitalizing on the idea that students should be free to nominate the peers who they personally believe best fit the relatively simple criteria that they have been given (e.g., “best friend,” “someone you like,” “someone who plays alone a lot”).

In this tradition, elaborate descriptions are usually not provided for the term *popular* (in the same way as they are not for “best friend” or “someone you like”). Participants are typically only primed with the term *popularity* as part of the question (“Name the peers in your grade who are popular”). This strategy makes sense because *popularity* is a term that has an immediate meaning among adolescents. This makes it an ecologically valid measure of status, but this validity may be lost or diluted when adults impose a meaning on the term. Evidence in favor of this strategy comes from studies that have used open-ended question formats (e.g., “What makes someone popular?”) to determine what children and adolescents understand the meaning of this construct to be within their own school, cultural, or subcultural context (e.g., LaFontana & Cillessen, 2002; Xie et al., 2006).

We also strongly recommend that no descriptive labels of popularity are given when collecting popularity nominations. In addition to adhering to the sociometric tradition, this procedure allows for variability in the meaning of popularity by age, gender, ethnicity, or culture. In the same way that children of different age groups have different definitions of friendship, the meaning and importance of popularity also vary across development (LaFontana & Cillessen, 2010). One of the most interesting recent developments in popularity research is the examination of cross-cultural differences in the definitions and meanings of popularity (see Marks et al., 2009). This research builds on the idea that children’s and adolescents’ definitions of popularity vary by cultural context. Providing a standard definition of popularity to accompany peer nomination items would prevent researchers from developing a richer understanding of cross-cultural variation in what popularity means to youth.

Positive and Negative Nominations

An issue already addressed is whether positive nominations (“most popular”) alone are sufficient or whether negative nominations (“least popular”) should also be collected. In the sociometric literature measuring

acceptance, there is a strong consensus that both positive (“liked most”) and negative (“liked least”) nominations are necessary. Researchers generally agree that it is essential to make a distinction between two types of children or adolescents who do not receive many acceptance nominations: those who are actively rejected (as indicated by many “liked least” nominations) and those who are neglected (as indicated by a lack of both rejection and acceptance nominations; e.g., Thompson & Powell, 1951).

For research on popularity, the issue is not to make a distinction between two groups at the low end of the status continuum but rather to make a distinction at the high end. In that sense, it is almost more critical to accompany “most popular” nominations with “liked most” nominations than with “least popular” nominations. Yet there are two reasons to include “least popular” nominations. First, a composite popularity score can then be derived from two items (“most popular” minus “least popular”) in the same way that acceptance is derived from two items (“liked most” minus “liked least”), and that makes the two scores more comparable when they are used in the same study. Thus, it is recommended to collect “most popular” and “least popular” nominations as well as “liked most” and “liked least” nominations. The advantage of using both “most popular” and “least popular” nominations is that a composite popularity score is created (“most popular” minus “least popular” nominations received), which is the equivalent of social acceptance as derived from “liked most” minus “liked least” nominations.

Second, the associations of unpopularity with popularity, acceptance, and rejection are insufficiently known. Low to moderate negative correlations have been found between popularity and unpopularity (Košir & Pečjak, 2005; Lease, Kennedy, & Axelrod, 2002). Just as acceptance and rejection may be seen as being separable constructs within unique behavioral correlates (Graham & Juvonen, 2002; Pakaslahti & Keltikangas-Järvinen, 2001; Parkhurst & Asher, 1992), the sparse research on the relationship between popularity and unpopularity indicates that these constructs also may be separable (Hopmeyer, Schwartz, Nakamoto, & McKay, 2007; Košir & Pečjak, 2005; Lease, Musgrove et al., 2002). To date, however, most studies either have collected popularity nominations without including unpopularity at all (e.g., Babad, 2001; Parkhurst & Hopmeyer, 1998) or have created composite measurements of popularity (e.g., de Bruyn & van den Boom, 2005; Prinstein & Cillessen, 2003). This inconsistency has created two conceptual problems for popularity research. First, we do not yet know the implications of including unpopularity either as a separate status measure or as part of a composite mea-

sure. Second, the use of single-item versus composite measures in different analyses makes it difficult to compare findings across studies. Given both these two issues, it is recommended to add “least popular” nominations to the data collection if practical and if ethical considerations allow it.

Same-Sex and Cross-Sex Nominations

There is also some debate in the popularity literature regarding whether nominations should be collected within gender only or whether cross-sex nominations should also be allowed. In the older sociometric literature of the 1970s and 1980s, some researchers collected same-sex peer nominations or ratings only (e.g., Asher et al., 1979). These studies were conducted with young elementary schoolchildren or even children in preschool groups in which play interactions are primarily between same-sex peers. Thus, it made good sense to limit nominations to within gender, because young children have more experience with their same-gender peers. However, numerous studies in the older sociometric literature collected both same-sex and other-sex nominations (e.g., Coie et al., 1982), and there are good reasons to assume that the cross-sex perspective adds to the reliability and ecological validity of status assessed.

Including cross-sex nominations is particularly important in popularity research, which is often conducted with preadolescent and adolescent youth. In early adolescence and beyond, interactions with members of the opposite sex become increasingly frequent. Peer cliques are no longer exclusively same sex in nature (see Brown, Chapter 8, this volume). In addition, status within one’s own gender may also depend on or be influenced by the frequency and nature of cross-sex interactions (see Carlson & Rose, 2007; Sebald, 1984).

Limited and Unlimited Nominations

An additional methodological issue regards the use of limited or unlimited nominations. Although limited nominations (typically three) were the standard in older sociometric studies, there are now compelling reasons to recommend the use of unlimited nominations under certain circumstances. The preference for unlimited nominations in modern sociometric research emerged in response to a very practical issue. Respondents in sociometric field studies complained that they wished to name more than three peers but were limited to three or that they did not know anyone who fit the sociometric item but were forced to come up with three names anyway. Researchers became aware that the ecological validity of partici-

pants' choices would improve if they were allowed to name as many or as few peers as they wanted in response to each question on the sociometric assessment.

Limited nominations have been used in both older studies (e.g., Coie et al., 1982) and newer studies (e.g., Rose et al., 2004). This method can be advantageous because participants are encouraged to select classmates who most clearly fit the sociometric items (Rose et al., 2004). However, limited nominations also reduce the number of choices each child receives; in some studies, as many as half of the participants were eliminated from analyses because they simply did not receive enough nominations to make any inferences about their status or behaviors (e.g., Babad, 2001). In addition, with limited nominations, each student is nominated on the basis of whether other students are nominated. Once the most obvious peers are chosen, the remaining peers will not be considered (Parkhurst & Asher, 1992). This conditional process may contribute to a skewed distribution of sociometric scores. One possible solution is to use multiple nominations for the same behavior and then compute aggregated scores across these multiple nominations. Another solution is to use unlimited nominations.

In recent studies on popularity, there is preference for unlimited nominations (as well as allowing both same-sex and other-sex choices). This preference is driven by the aforementioned improved ecological validity of unlimited nominations and by the need to obtain a more optimal distribution of nominations received among participants. Two confounded factors that play a role in the decision to use limited or unlimited nominations are participant age and the nature and size of the reference group. For older participants (adolescents), the freedom of choice to deviate from three nominations becomes particularly important. These participants are also in larger reference groups (middle or high school grades instead of elementary school classrooms), where limited nominations lead to more skew in the data and unlimited nominations contribute to a more normal spread of scores across all participants. Thus, unlimited nominations are particularly important when sociometric data are collected with older age groups and in larger grades. In popularity research in middle and high school grades, unlimited nominations are strongly recommended. It matters less whether limited or unlimited nominations are used when sociometric data are collected with younger children in elementary school classrooms or in secondary school settings that are highly structured by classroom groups, as in some countries outside of North America (see, e.g., de Bruyn & Cillessen, 2006a, 2006b).

PSYCHOMETRIC PROPERTIES OF SOCIOMETRIC MEASURES OF POPULARITY

This section reviews the psychometric properties of quantitative (sociometric) measures of popularity, as far as they are available. Four psychometric properties are examined: reliability, stability, discriminant validity, and construct validity. This section focuses on measures of popularity only, not acceptance or preference. They are mentioned only if they serve a purpose for comparison.

Reliability

Many of the considerations of reliability are not as applicable to sociometric methods as they are to other psychological measures. Interrater reliability, although calculable for sociometric ratings, rankings, and paired comparisons, is usually not determined for the more commonly used peer nomination methods. Interitem reliability is also less vital in sociometric methods. Many researchers, in fact, use single-item measures to assess behavioral or affective constructs, arguing that the number of respondents and the face validity of questions mitigate the general methodological difficulties of single-item measures (Becker & Luthar, 2007; Parkhurst & Asher, 1992). Popularity, in particular, has been investigated using one or two items (i.e., either a single popularity item or a popularity item and an unpopularity item). This practice is deliberately designed to evoke the participant's definition of the term; adding additional items would be counterproductive to allowing participants to define "popularity" for themselves.

The primary form of reliability to be considered for popularity assessments is test–retest reliability. Cillessen, Bukowski, and Haselager (2000) used a time interval of 3 months, roughly the equivalent of one semester in school, as a practical guideline to distinguish reliability from stability in sociometric research. Test–retest correlations across intervals shorter than 3 months were considered measures of reliability; test–retest correlations across intervals longer than 3 months were considered measures of stability. This guideline is followed here.

Because research on popularity is relatively new, and past studies are more scattered throughout history and substantive field, less information is available about the reliability of popularity than of acceptance, rejection, and preference. In fact, we know of only one study that determined the test–retest correlations of measures of popularity across intervals shorter than 3 months and that also included measures of acceptance and

rejection at the same time for comparison purposes (van den Berg, 2009). In this study, peer nominations of popularity, acceptance, and rejection were collected in grades 7 and 8 across 8-week intervals in the late fall and winter of the school year. High test–retest correlations were found for composite measures of popularity, and they were higher than for concurrent measures of acceptance and rejection. The test–retest reliability of popularity measures in early adolescence appears to be high.

Stability

Stability information is more often reported in sociometric studies. In a meta-analysis, Jiang and Cillessen (2005) reported average stability correlations of about .60 for acceptance, rejection, and preference. The stability correlations for popularity that have been reported in studies tend to be higher than this estimate. Studies that have directly compared the stabilities of popularity with the other sociometric dimensions also consistently find that the stability of popularity is higher than the stabilities of acceptance, preference, and rejection (Cillessen & Borch, 2006; Cillessen & Mayeux, 2004; Rose et al., 2004).

The fact that popularity is more stable than preference makes sense. Popularity is a reputation for which there is, by definition, a certain degree of consensus in the peer group. Preference-based measures reflect individual judgments of liking and disliking that are more heavily influenced by changes in the social behavior of the votee and the level of interaction between the voter and the votee. They do not measure a shared group perception but an individual choice. This argument was confirmed in recent analyses by van den Berg (2009), who conducted a variance componential analysis (Kenny, 1994) on ratings of likeability and popularity within classrooms and showed that ratings of popularity are primarily driven by characteristics of the child being judged (partner variance), whereas ratings of likeability depend more on the combination of rater and the ratee (dyadic variance).

Discriminant Validity: Popularity–Preference Correlations

Researchers have occasionally asked whether measures of popularity are actually all that different from measures of acceptance or preference. Parkhurst and Hopmeyer (1998) initially provided an answer to that question by reporting a correlation of .40 between composite measures of popularity and preference. This correlation was confirmed in later studies that also demonstrated that the distinction between preference

and popularity widens across adolescence for both genders, especially for girls (e.g., Cillessen & Mayeux, 2004). The following section reviews the evidence regarding the preference–popularity correlation and also reviews how this association varies by age and gender.

Popularity–Preference Correlations

Quite a few studies have reported correlations between preference and popularity. The majority of these compare preference (acceptance minus rejection) with composite popularity (popularity minus unpopularity). The correlations tend to vary by age and gender. Correlations are moderate to high in middle childhood and early adolescence (Andreou, 2006; Cillessen & Mayeux, 2004; de Bruyn, Cillessen, & Wissink, 2010; de Bruyn & van den Boom, 2005; Košir & Pečjak, 2005; Sandstrom & Cillessen, 2006; Sijtsema, Veenstra, Lindenberg, & Salmivalli, 2009; see Cillessen & Borch, 2006, for an exception) but are lower in middle adolescence (Cillessen & Borch, 2006; Cillessen & Mayeux, 2004; Košir & Pečjak, 2005; LaFontana & Cillessen, 2002; Prinstein & Cillessen, 2003). The gender effect is more consistent; across ages and time points, correlations between social preference and composite popularity are (often significantly) higher for boys than girls (Andreou, 2006; Cillessen & Borch, 2006; Cillessen & Mayeux, 2004; LaFontana & Cillessen, 2002; Prinstein & Cillessen, 2003). Studies reporting correlations between acceptance and popularity scores (i.e., without including aspects of rejection or unpopularity) tend to mirror those that use preference and composite popularity measures; they find that these correlations are moderate to high in middle childhood/early adolescence (Babad, 2001; Lease, Musgrove, et al., 2002) and low to moderate in middle adolescence (Babad, 2001; Košir & Pečjak, 2005; Parkhurst & Hopmeyer, 1998).

Gender Differences

Cillessen and Mayeux (2004) directly addressed the question of why the correlations between social preference and composite popularity tend to be significantly higher for boys than for girls and why, as their results showed, this correlation declines over time for girls more than for boys. They offered two explanations: (1) Boys are able to balance popularity and likeability without the use of aggression, whereas girls increasingly use manipulation and relational aggression (which are related to increased peer rejection; see Crick, Murray-Close, Marks, & Mohajeri-Nelson, 2009, for a review) over time, and (2) boys and girls are both

manipulative, but girls are more likely than boys to be rejected when they engage in relationally aggressive actions. Although these explanations are plausible, they are based primarily on the effects of aggression. Further research is needed to explore more fully these and other possible hypotheses for the gender difference in the association between popularity and likeability.

Age Differences

The linear decline in the magnitude of the correlation between popularity and preference may be due to a number of factors. First, social and cognitive faculties are continually developing throughout childhood and adolescence and may provide increasing capacity to understand the complexities of status hierarchies and to make fine distinctions between affective versus consensus-based judgments.

Another explanation for the decreasing popularity–preference correlation may be that, as adolescents develop, the process of remaining popular becomes less conducive to being accepted or vice versa. Whereas some studies have, indeed, shown that popularity is related to increases in antisocial behavior (Mayeux et al., 2008; Sandstrom & Cillessen, 2006), others have shown that popularity in middle school is actually related to small increases in social preference over time (Cillessen & Mayeux, 2004). This pattern of results may make it difficult to explain why the popularity–preference correlation becomes progressively lower during adolescence. However, developmental changes in the prioritizing of status and the factors associated with achieving and maintaining it are likely strong influences in this trend (see Cillessen, Chapter 12, this volume).

Construct Validity: Correlations with Social Behavior

The final issue of importance regards the unique correlates of popularity that confirm its theoretical conceptualization as a measure of impact, visibility, or dominance and that also further distinguish it from social preference. Analogous to earlier research on traditional sociometric status, in particular rejection (see Asher & Coie, 1990), three groups of correlates can be distinguished: social-behavioral, social-cognitive, and emotional. The majority of the recent studies on popularity have focused on the unique behavioral correlates of preference and popularity, and within the behavioral domain a key focus has been on aggression (both overt and relational). This research has consistently shown that whereas preference is typically negatively associated with measures of aggression,

the association of aggression (in particular relational aggression) with popularity is positive. These associations with aggression have been a key factor in demonstrating the unique construct validity of preference and popularity.

The unique behavioral, social-cognitive, and emotional correlates of preference and popularity are documented elsewhere in this volume (see Aikins & Litwack, Chapter 7, and Mayeux et al., Chapter 4). It should be noticed, however, that the number of studies that have looked at social-cognitive or emotional variables is small compared with the number of behavioral studies. More research in these other domains is needed. In the final chapter of this volume, Cillessen and Mayeux provide a broader context in which to integrate the unique behavioral, social-cognitive, and emotional correlates of popularity and preference.

ALTERNATIVE MEASURES OF POPULARITY

In addition to sociometric measures of popularity and related constructs (e.g., coolness, admiration) discussed previously, additional measures of popularity have been used in the literature that are not derived from the perspective of peers but rather are based on other sources. These have been used in situations where it is not possible to use peer nominations. We discuss these nonsociometric, non-peer-based alternative measures of popularity next. They are measures of popularity (or related constructs) derived from self-judgments, teacher ratings, or observations conducted by trained coders.

Self-Ratings

A relatively frequently used procedure in peer relations research is to ask children or adolescents to assess their own self-perceived degree of likeability or acceptance in the peer group using single-item ratings or multiple-item scales from existing instruments such as the Harter scales (e.g., Boivin & Bégin, 1989; Cillessen & Bellmore, 1999). Less commonly, as part of a sociometric procedure, children or adolescents are asked to indicate not only who they themselves like most and like least but also who they think likes or dislikes them. Scores for the accuracy of social self-perceptions are then derived from comparisons of the self-perceived nominations with the actual pattern of nominations (see Bellmore & Cillessen, 2003, 2006; Zakriski & Coie, 1996). Another approach is to ask children or adolescents to rate their own popularity in the peer group.

This allows researchers to assess accuracy and evaluate how awareness of one's own place in the peer hierarchy affects behavior or interacts with other factors (such as one's actual popularity level) to affect behavior (see Mayeux & Cillessen, 2008).

Self-perceptions of acceptance and popularity are valuable additions to popularity research. However, they cannot serve as replacements for the perspective from peers. Similar to acceptance, the correlations between self- and peer perceptions of popularity are usually significant and positive but too low to justify that one replaces the other (see, e.g., Mayeux & Cillessen, 2008). Thus, although it is highly recommended to include self-perceptions of popularity in studies that also include peer-based sociometric measures, the self-judgments cannot replace the judgments from peers.

Teacher Ratings

It has often been suggested that teachers may be surveyed instead of peers in order to obtain data about peer status. Teachers have a broad reference group against which they can judge student behavior, making them well able to distinguish students on various behaviors and traits such as aggression and peer sociability (Clarke & Ladd, 2000; Coie & Dodge, 1988). However, teachers are less accurate judges of peer status. They lack the inside perspective on important events in the peer group that often happen in hallways, in bathrooms, or on the way to home or school, outside of their view (Coie, Dodge, & Kupersmidt, 1990). Teacher judgments have the additional disadvantage of reflecting a single viewpoint, whereas peer-report data are based on the composite judgments of multiple informants.

Studies by Cillessen, Terry, Coie, and Lochman (1992) and Pennings (2009) yielded three conclusions regarding teachers' ability to identify peer status. First, teachers are not very accurate judges of traditional sociometric status. Their classification of students into the five status types have low correspondence with the classifications derived from peer nominations. Second, teachers tend to believe that most students are better liked than they actually are. Third, individual teachers vary markedly in their accuracy, although full-time teachers show higher accuracy than part-time teachers, because (presumably) they have more contact with the students.

This latter finding is encouraging because it suggests that teacher ratings are indeed based on the patterns of observations of the peer groups in their classrooms rather than something else (such as their own prefer-

ences for students). Yet the relatively low teacher–peer correspondence in general confirms a long-standing consensus that peers tend to have a better idea of each others’ social abilities and peer relationships than do teachers (Rubin & Cohen, 1986).

That being said, some influential studies on popularity have appeared that are based on teacher judgments. Rodkin et al. (2000) used teacher judgments to identify high-status peers and then divided them into two subgroups: “toughs” and “models.” These subgroups correspond, in terms of their behavioral and other attributes, to students who score high on popularity and acceptance, respectively. This correspondence of results between teacher- and peer-based findings supports the validity of the teacher-report measure of high status. Yet the fact remains that in other studies the correspondence between peer and teacher measures has been less than ideal (e.g., Babad, 2001).

In order to resolve this issue, research is needed on the correspondence between teacher and peer assessments of acceptance and popularity. Because popularity is a reputation for which there is more consensus in the peer group than for likeability, we hypothesize that the teacher–peer correlation will be higher for popularity than for likeability. This hypothesis should be tested to gain further insight into the value of teacher ratings of popularity.

Observations

A third assessment possibility is to observe the indicators of popularity systematically. It is not possible to observe popularity directly because it is an evaluative judgment derived from group members. Yet it is possible to observe the behavioral or other correlates of popularity. For example, observations of interactions between adolescents at a high school dance might suggest who is popular and who is not (see Pellegrini, Roseth, Van Ryzin, & Solberg, Chapter 6, this volume). If observed interaction patterns have previously been validated in studies that also include direct measures of popularity, the observed patterns might become proxies in studies where peer nominations are not possible. Another example of this approach is the early observational work by Vaughn and Waters (1980), who measured visual regard in preschool groups. Children in preschool groups who received the highest amount of visual regard from peers can be considered dominant or socially central. They might be considered popular, but the observations of visual regard were originally intended to observe social dominance (as in ethological research). It is not surprising that observational approaches originated in ethology-inspired research, as in the work of Pellegrini et al. (Chapter 6, this volume) and Vaughn

and Waters (1980; see also Hawley, 2003). However, as indicated earlier, observations of social dominance cannot replace peer nominations or ratings of popularity, which remain the gold standard for the assessment of popularity in the peer group.

CONCLUSIONS AND RECOMMENDATIONS

In this chapter we set out to review past and current measures of popularity in the child and adolescent peer group. One primary goal was to review existing terminology and propose a clear set of terms for use in future studies. In past studies, the term *popularity* has been used inconsistently and often used when acceptance, preference, or likeability were actually measured instead. Consistent with previous sociometric studies, the term *acceptance* should be reserved for “liked most” nominations, likeability ratings, and other assessments of likeability. The term *rejection* should be reserved for “liked least” nominations, or the lowest rating points on a likeability scale. *Preference* should be used to refer to the composite score created by using both “liked most” and “liked least” nominations received; it is still very much a measure of likeability in the peer group. *Impact* is the sum of “liked most” and “liked least” nominations received, a less frequently studied construct. Importantly, the term *popularity* should be reserved for measures derived from “most popular” nominations, “most popular” minus “least popular” nominations, or popularity ratings.

As a corollary of this proposal, we suggest that use of the terms *sociometric popularity* and *perceived popularity* should be discontinued. The term *sociometric popularity* is a source of confusion because both forms of high status in the peer group are typically assessed with peer nominations. Sociometric popularity should simply be called “acceptance” or “preference.” *Perceived popularity* then simply becomes “popularity.”

A challenge of this proposal is how to refer to results from past studies using traditional sociometric status types in which the term *popular* is used for a well-liked, preferred, highly accepted group. In descriptions of results from those studies, instead of using the term “sociometrically popular” for this group, it should instead be referred to by the terms *well-liked*, *accepted*, or *preferred*. For example, instead of saying that sociometrically popular children are cooperative, whereas perceived popular children are also aggressive, it should be stated that well-liked children are cooperative, whereas popular children (or adolescents) are also aggressive. More consistent use of these status-related terms will yield greater clarity in the popularity literature. A related implication is

that measures of network centrality, desired peer affiliation, dominance, admiration, or coolness should not be called popularity, but rather should be transparently described as the psychological constructs that they actually measure.

The terminology in previously published articles obviously cannot and should not be changed, and the reasons for their terminology were valid and logical at the time. However, it seems like an appropriate time to adjust the labels of the traditional sociometric status types *popular*, *rejected*, *neglected*, *controversial*, and *average*. As research on popularity is growing, it seems wise to replace the label “popular” in the traditional sociometric classification system with “accepted.” It made sense in the 1980s to call this group “popular,” as was done by the researchers who proposed this classification system (Coie et al., 1982; Newcomb & Bukowski, 1983). However, the label “popular” for a group that is defined by acceptance, preference, or likeability has been a source of some confusion in recent research. Therefore, as research on popularity is growing, when summarizing results from past studies using the traditional sociometric types and when conducting new studies with these types, we recommend the use of the label “accepted” instead of “popular” for status types based on “liked most” and “liked least” nominations or other judgments of likeability. “Popular” can then be reserved for sociometric dimensions and groupings based on “most popular” and “least popular” nominations of other popularity judgments.

An important reason for a clear distinction of terms is that empirical studies have shown consistently that preference and popularity are not identical constructs. The correlation between them is low, and, as shown in other chapters in this volume, both correlate uniquely with different concurrent characteristics and later outcomes. What is known about the unique characteristics of preference and popularity is found primarily in the domains of concurrent social behaviors (particularly aggression) and later academic and antisocial behavior outcomes. These characteristics form the beginning of further explorations of the unique features of popularity and how it is different from acceptance or preference. The last chapter of this volume provides a broader theoretical context of these measures and a corresponding research agenda for further popularity research.

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