

Development of Ethnic, Racial, and National Prejudice in Childhood and Adolescence: A Multinational Meta-Analysis of Age Differences

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This meta-analysis summarizes 113 research reports worldwide (121 cross-sectional and 7 longitudinal studies) on age differences in ethnic, racial, or national prejudice among children and adolescents. Overall, results indicated a peak in prejudice in middle childhood (5–7 years) followed by a slight decrease until late childhood (8–10 years). In addition to differences for the various operationalizations of prejudice, detailed findings revealed different age-related changes in prejudice toward higher versus lower status out-groups and positive effects of contact opportunities with the out-group on prejudice development. Results confirm that prejudice changes systematically with age during childhood but that no developmental trend is found in adolescence, indicating the stronger influence of the social context on prejudice with increasing age.

Ethnic, racial, and national prejudice relate to serious social problems such as educational discrimination, social exclusion, school bullying, hate crimes, and even international conflicts (e.g., Bar-Tal & Teichman, 2005; Rudolph, 2003). As a result, social scientists have been investigating the roots of prejudiced attitudes and behaviors for decades. Alongside social psychological research on the cognitive, motivational, and social aspects of prejudice (e.g., Allport, 1954; Sherif, 1936; Tajfel & Turner, 1979) and the examination of interindividual differences in prejudice within personality psychology (e.g., Adorno, Frenkel-Brunswik, Levinson, & Sanford, 1950), there has also been a growing interest in a developmental perspective that addresses the acquisition, formation, and change of prejudiced attitudes and behaviors (e.g., Bennett & Sani, 2004; Levy & Killen, 2008; Quintana & McKown, 2007).

The critical finding that prejudice seems to emerge very early in life has encouraged researchers since the 1920s to focus on developmental aspects when trying to explain and prevent preju-

dice and discrimination (e.g., Clark & Clark, 1940; Katz, 1976; Lasker, 1929; McGlothlin & Killen, 2006; Williams, Best, & Boswell, 1975). However, the potentially favorable prospects of this approach highlight the need for a systematic integration of the large number of empirical studies carried out over the past 90 years. This article presents a meta-analytical review summarizing these results of the research on the development of ethnic, racial, and national prejudice.

Prejudice can be viewed as a multifaceted phenomenon, and it has been conceptualized in various ways in past social psychological research (see Duckitt, 2010). A common point is that ethnic, racial, and national prejudice can be defined as a negative orientation toward individuals or groups due only to their ethnic or racial group membership or nationality (see Brown, 2000). It is characterized along multiple dimensions, including the negative attitude expressed through dislike of a social out-group (affective component), the attribution of negative characteristics (cognitive component), or negative behavior (behavioral component). Furthermore, prejudice reflects a generalization whereby the negative evaluation addresses all (or at least most) members of the out-group disregarding individual differences. Thus, negativity is based not on individual characteristics, but on presumed or attributed internal (e.g., nationality) or perceivable

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external features (e.g., skin color) shared by the members of that out-group.

Recent research on the development of prejudice among children and adolescents has focused on various influencing factors across individual and social-environmental levels of explanation. Numerous studies include work on cognitive or social-cognitive abilities such as classification skills, social perspective-taking abilities (Aboud, 1988; Bigler, Jones, & Loblinger, 1997; Smetana, 2006), lay theories (Levy, Karafantis, & Ramírez, 2008), group norm understanding (Abrams & Rutland, 2008), or moral development (Killen, Margie, & Sinno, 2006). Further investigations focus on motivational processes like ethnic awareness and ethnic identity development (Nesdale, 1999; Rutland, Abrams, & Levy, 2007), as well as social-environmental factors like having a friendship with an out-group member (Feddes, Noack, & Rutland, 2009), parents with negative intergroup attitudes (Benbow & Beelmann, in press; White & Gleitzman, 2006), or intergroup contact (Tropp & Prenovost, 2008).

However, despite this extensive research several issues in the development of prejudice remain unresolved. One aspect is that empirical findings about age-related changes in prejudice are less consistent than usually assumed. As a frequently described pattern, the development of prejudice is characterized as a nonlinear trend with an increase until the age of 7 years (e.g., Duckitt, Wall, & Pokroy, 1999), a decrease until the end of elementary school age (e.g., Aboud, 1980; Doyle & Aboud, 1995), and a second increase in adolescence (e.g., Augoustinos & Rosewarne, 2001). Because this inverted-U-shaped form in childhood merely reflects the results of some single, although important, studies and neglects inconsistent results (e.g., Baker & Fishbein, 1998; Rutland, 1999), it has been criticized intensively in the past years (e.g., Nesdale, 2000). Moreover, the utility of describing a domain-general trend (in the sense of a *unique* developmental course) without taking different social contexts, out-groups, and dimensions of prejudice into account has been questioned (Rutland, Killen, & Abrams, 2010).

Indeed, research has become far more domain specific in addressing this multifaceted character of prejudice by using different operationalizations to measure it. For example, age-related changes in the cognitive, affective, or behavioral aspects of prejudice have been investigated (Barrett & Short, 1992), and further, assessment strategies have attached more importance on the differentiation between out-group negativity and in-group bias (i.e., more

positive ratings on a positive dimension; see Aboud, 2003). Older studies especially operationalized prejudice mainly by explicitly asking children what they think or feel toward different groups, using measures like the Doll Test (Clark & Clark, 1940), the Preschool-Racial Attitude Measure (PRAM; Williams et al., 1975), or the Multiresponse Racial Attitude (MRA; Doyle & Aboud, 1995), while subtle and implicit prejudice measures have become more relevant in recent years (Banaji, Baron, Dunham, & Olson, 2008; Persson, 2003). For example, McGlothlin and Killen (2006) used pictures of Black and White children in ambiguous situations to measure negative attributions based on ethnic group membership. Baron and Banaji (2006) used the Implicit Association Test (IAT) among children to investigate negative evaluations toward Afro-Americans by diminishing the effects of social desirability. In sum, newer empirical studies focus on more specific aspects and conceptualizations of prejudice, but the important question of how divergent aspects of prejudice change with age and develop remains.

A further unanswered question concerns the degree of how developmental trends in prejudice are shaped by social experiences and environmental variables. The vast majority of past empirical studies have investigated changes in prejudice with age depending on characteristics of the in-group children belong to and the out-group children evaluate, like their social status. More specifically, studies have focused mainly on attitudes of European American children toward minority groups, particularly African Americans or Latinos (Baker & Fishbein, 1998; Doyle & Aboud, 1995). In the last few years, a growing interest into changes in intergroup attitudes of individuals from diverse social minority and majority groups has arisen (e.g., Killen, Henning, Kelly, Crystal, & Ruck, 2007; Verkuyten, 2002). For example, Griffiths and Nesdale (2006) found a decrease of prejudice of majority Anglo-Australian children toward Pacific Islanders in late childhood, while prejudice of immigrant Asian children toward Anglo-Australians remained unchanged with age. These results indicate different developmental pathways for prejudice with respect to the social status of children and adolescents, and should be explored in more detail.

Finally, numerous studies within social psychology have investigated whether contact between social groups is related to prejudice, as assumed in the contact hypothesis of Allport (1954). Indeed, large recent meta-analytic studies confirm that greater levels of intergroup contact are widely

associated with lower levels of intergroup prejudice among children and adolescents (mean $r = -.215$; see Pettigrew & Tropp, 2006, 2008; Tropp & Prenovost, 2008), even if the conditions assumed by the contact hypothesis, such as equal status or common goals, are not fulfilled. However, the impact of contact on the *development* of prejudice is less obvious. In fact, Tropp and Prenovost (2008) found positive effects of contact to be independent of the age of children and adolescents (i.e., contact had almost the same effect in each age group) but suspected that “early contact experiences would be instrumental in nurturing the long-term development of positive intergroup attitudes” (p. 245). Although it is apparent that contact has positive effects on intergroup attitudes (see also Paluck & Green, 2009), it remains unclear, how prejudice changes with age in relation to the extent of contact with the out-group.

Given these open questions remaining in the current field of prejudice research in children, taking a closer look at the development of prejudice by summarizing research on age differences seems worthwhile. Generally, investigating the association between age and prejudice is of major concern in developmental social psychology for several reasons (see, e.g., Doyle & Aboud, 1995; Dunham & Degner, 2010).

First, the study of age differences in prejudice over different cohorts of children and adolescents may provide evidence for the existence of a universal, age-related, developmental course (Baltes, Lindenberger, & Staudinger, 1998) and extend knowledge on the normative development of prejudice. This is a necessary requirement for making sound developmental prognoses and estimating the normativity of prejudice at different ages. For example, Arthur, Bigler, Liben, Gelman, and Ruble (2008) examined gender stereotypes and suggested that stereotyping in young children is normal. They predicted that stereotypes are also likely among children with egalitarian parents, although this does not mean that their stereotypes are not immutable. Predictions like this require knowledge about the developmental trend of prejudice. Moreover, characterizing a normative pathway is a necessary step in the analysis of escalating developments in prejudice toward racism or extremism (Beelmann, 2009).

Second, investigating age differences by analyzing groups of children and adolescents living in different environments (e.g., within different social groups) enables researchers to examine how much environmental factors will influence developmental

pathways of prejudice in general. For example, homogeneous pathways of prejudice across divergent social or cultural environments would suggest a smaller influence of environmental influences on development. In addition, environmental influences could vary in different age periods (Baltes et al., 1998). An investigation of age differences in prejudice would then provide an opportunity to detect sensitive periods in which environmental factors have an extraordinary impact on the level and change of prejudice by definition (see Roberts, Walton, & Viechtbauer, 2006; Thomas & Johnson, 2008). For example, Devine (1989) assumed that early childhood is a sensitive period for the formation of implicit prejudice in which children are more susceptible to contextual influences compared to other age periods.

Third, as age and age differences are proxies for a host of bio-psycho-social developmental processes (Magnusson & Bergman, 1990; Schmidt & Teti, 2005), studying these variables has at least some implications for developmental theories about intergroup attitudes and prejudice (see Aboud, 2003; Nesdale, 2000). Recent theories of intergroup attitudes favor a domain-specific view (Levy & Killen, 2008; Nesdale, 2001; Tropp & Prenovost, 2008), and assume that prejudice depends on the complex interplay between sociocontextual and sociocognitive variables (such as moral judgment, group reasoning, social norms, and intergroup contact). Consequently, these theories do not rely on general assumptions about age differences (e.g., Nesdale, Maass, Griffiths, & Durkin, 2003). However, an investigation of systematic age differences across diverse contexts would deliver additional validation for the domain-general (prejudice development as part of general cognitive development) or domain-specific (Rutland et al., 2010) views of the development of prejudice.

Fourth, analyses of age differences are necessary when designing developmentally appropriate interventions (Killen & McKown, 2005; Masten, 2009). Knowledge about normativity and the possibility of changing prejudice in different age periods delivers information about the age at which prevention programs are indicated. For example, interventions seem to be more successful in age periods during which the target behavior or attitudes change *per se*, because changing individuals are more receptive for environmental input (Granic & Patterson, 2006). Thus, a developmental trend in prejudice would deliver knowledge about the most appropriate point in time for implementing intervention programs.

Several reviews have already summarized empirical results to gain an overview on the developmental course of prejudice and intergroup attitudes (Aboud & Skerry, 1984; Bonvillain & Huston, 2000; Brand, Ruiz, & Padilla, 1974; Enesco, Giménez, del Olmo, & Paradela, 1998). Beyond the obvious problem that these reviews omit the very intensive research carried out in recent years (e.g., Levy & Killen, 2008), they also focus only partly on age differences, concentrating far more on risk factors for negative attitudes, such as ethnic identity development (e.g., Brand et al., 1974). In addition, narrative reviews have natural limits when it comes to synthesizing heterogeneous study results in a sophisticated way, especially when the number of studies is high. Thus, taking these points together, the existing reviews cannot give a sufficient summary of the current state of research on age differences in prejudice.

Meta-analyses offer a more elaborative way of integrating a large pool of studies (Lipsey & Wilson, 2001). Compared to single empirical studies, they permit more differentiated conclusions and allow a higher generalization of research results across sample characteristics, cultural backgrounds, different out-groups, and several methodological variables (Beelmann & Lipsey, in press). Hence, our meta-analysis will synthesize empirical studies on age differences in ethnic, racial, and national prejudice among children and adolescents within the framework of a developmental meta-analysis. In line with the aforementioned unresolved questions and reasons for investigating age differences, our approach is designed to (a) resolve inconsistent findings by characterizing a possible normative developmental trend of prejudice shared by all or at least subgroups of children and adolescents. In addition, we (b) consider whether there are differences in the developmental course of divergent facets and dimensions of prejudice, such as ethnic, racial or national prejudice, explicit or implicit measures, or cognitive, affective and behavioral operationalizations. Moreover, we investigate (c) the influence of the social status of the out-group and (d) opportunities for contact on age differences in prejudice more closely. Finally, we (e) quantify the effects of further methods and sample characteristics (e.g., threats to validity, year of sampling) on age-related changes.

Method

Conceptualization of the Study

The goal of a developmental meta-analysis is to identify trends in age differences across disparate

data sets and to analyze these trends in terms of moderating influences (Laursen, Finkelstein, & Townsend Betts, 2001). There are two possible strategies for making results comparable across studies: One is to compare the level of prejudice *between* studies, for example, to compare studies of 5-year-olds with studies of 7-year-olds. The level of prejudice would then be the dependent variable, and age would be investigated as a moderator explaining differences in prejudice between studies. However, using this strategy confounds age differences with other between-study differences such as sample characteristics (e.g., if samples of predominantly American 5-year-olds were to be compared with British 7-year-olds) or assessment procedures (e.g., if prejudice were to be measured more often by tests among 5-year-olds and by questionnaires among 7-year-olds). Moreover, because prejudice is usually measured with different instruments across studies, standardized effect size calculation of prejudice requires information on in- and out-group evaluations to make the extent of prejudice between samples comparable (i.e., studies measuring only out-group evaluations have to be excluded).

For these reasons, we preferred adopting a second strategy, which operationalizes the *age difference in prejudice* as the dependent variable and integrates cross-sectional and longitudinal studies investigating prejudice in different age groups. This allows us to calculate unconfounded age differences and to include studies measuring evaluations solely toward one group on a negative dimension. In addition, this strategy makes an explanation of the variability of age differences in prejudice across studies by testing moderators of these age differences (e.g., sample characteristics) possible. This enables us to investigate the variability of developmental changes in children across samples in a way comparable to an analysis of interindividual differences in intraindividual change within samples.

Inclusion Criteria

To capitalize on these advantages, we conducted a so-called direct developmental meta-analysis (Laursen et al., 2001) and selected studies along the following eligibility criteria.

First, studies had to compare prejudice in at least two age groups with at least a 1-year difference in age (cross-sectional), or one group of children had to be measured twice over a period of at least 1 year (longitudinal).

Second, prejudice had to be assessed as a negative reaction toward ethnic, racial, or national

out-groups. This negativity could be operationalized either through an evaluation of an out-group on a negative dimension (independent from any evaluation of other groups) or through an evaluation of the out-group compared to the in-group on a positive or negative dimension. However, if a study evaluated the out-group on a positive dimension alone (e.g., liking) we did not view this as a measurement of prejudice and excluded the study. Negative evaluations could be assessed explicitly or implicitly using either cognitive (e.g., negative trait attribution), affective (e.g., expression of dislike), or behavioral (e.g., social distance) measures.

Third, prejudice measures had to reflect a direct evaluation of a natural ethnic, racial, or national out-group. Studies that measured prejudice toward nonethnic or artificial out-groups (e.g., studies based on the minimal group paradigm) were excluded. Moreover, because the negative reaction should be due to group membership alone and not to individual characteristics, we excluded studies using sociometric measures of negativity toward familiar individuals (e.g., like classmates). We also excluded measures evaluating out-groups indirectly (e.g., by evaluating the behavior of an in-group member who excludes an out-group member).

Fourth, participants in primary studies had to be aged 19 years or below. We chose this upper limit, because major life transitions occur after this age in most countries (e.g., university entrance, military service) that define the beginning of early adulthood (Valsiner & Connolly, 2003).

Fifth, we included only nonclinical samples (e.g., no delinquent samples) containing at least 10 participants per age group.

Sixth, we excluded samples from experimental and intervention studies that manipulated or trained prejudice-related variables, but integrated data from control groups with no manipulation.

Finally, manuscripts had to be written in English, German, or another European language (e.g., Dutch, French, Portuguese, or Spanish).

Study Identification and Literature Search

The literature search ran from summer 2006 to spring 2009. We integrated all research documents published until the end of 2008, and applied several strategies to obtain the most comprehensive pool of studies: First, we searched for documents in databases such as *PsycINFO*, *Psyn dex*, *PubMed*, *Eric*, and *ProQuest* using combinations of the following keywords: (a) terms describing prejudice or related

constructs: *prejudice*, *attitudes*, *stereotypes*, *in-group bias*, *intergroup attitudes*, or *preference*, and (b) terms relating to age: *development*, *age differences*, *change*, *childhood*, *adolescence*, *children*, or *adolescents*. Second, we screened the reference lists of previously identified research documents. Third, we performed a manual search for relevant studies in all issues of the five journals with the highest number of documents matching our criteria. These were *Child Development*, *Journal of Genetic Psychology*, *Developmental Psychology*, *Journal of Cross-Cultural Psychology*, and the *British Journal of Developmental Psychology*. Fourth, we entered the earlier mentioned keywords in an Internet search via Google. Finally, we contacted researchers and asked them for further publications and unpublished manuscripts. Overall, we checked more than 8,000 titles or abstracts, and used the relevant eligibility criteria to screen 365 documents completely.

From these 365 documents, we excluded 252 (69.0%) for the following reasons: 136 measured no ethnic, racial, or national prejudice; 74 did not report or investigate age differences; 15 provided no empirical data; 10 investigated prejudice toward artificial out-groups; 8 investigated people outside the set age range; 7 were classified as dual publications; and 2 reported a sample size below 10 participants. This left 113 research documents for the final meta-analysis. Of these, 111 reported the results of 121 independent cross-sectional studies (a table detailing characteristics of these studies as well as a complete reference list for the studies are available in Table S1 and Appendix S1, online supporting information) and five reported the results of seven longitudinal studies (three documents reported both longitudinal and cross-sectional studies; see overview in the Results section, Table 5).

Construction of Age Contrasts

Our units of analysis were age contrasts (i.e., differences in prejudice between an older and a younger group). Within each independent study, multiple age contrasts were possible if (a) more than two age groups were investigated (e.g., 5-, 8-, and 11-year-olds); (b) separate results were reported for different ethnic, racial, or national subsamples (e.g., studies investigating prejudice in Black and White children); or (c) prejudice was investigated separately in girls and boys.

Within each age contrast, our dependent variable was the mean difference in prejudice (expressed in effect sizes) between two age groups. One central problem when integrating research findings was

the heterogeneity of the age spans used in the primary studies (see Table S1). For example, whereas some studies compared prejudice in preschool children with a 1-year age difference (e.g., Laishley, 1971), others compared preschool with elementary school children (e.g., Aboud, 2003). Thus, after the first screening of studies, we applied the following unified coding scheme to integrate as many studies as possible. First, we formed six different age categories based on developmental age periods (see Valsiner & Connolly, 2003) in childhood and adolescence: *early childhood* (2–4 years), *middle childhood* (5–7 years), *late childhood* (8–10 years), *early adolescence* (11–13 years), *middle adolescence* (14–16 years), and *late adolescence* (17–19 years). We considered these categories to be the most appropriate age ranges, because they were small enough to detect even slight developmental changes but large enough to investigate age differences in studies with larger age intervals. Furthermore, the age categories enabled us to detect nonlinear developmental trends in prejudice in childhood and adolescence.

To calculate effect sizes, we performed contrasts both *between* and *within* these age categories. For contrasts between age categories, we synthesized all studies investigating age differences between two groups of children or adolescents classified into two consecutive age categories. For example, if a study measured prejudice among 6- and 9-year-old children, we categorized it as a contrast between middle childhood (age 5–7 years) and late childhood (8–10 years) and integrated it with all other studies investigating differences between groups of children within these two age categories. For contrasts within age categories, we compared the prejudices of two groups of children or adolescents within one age category (e.g., 5- and 7-year-olds) and synthesized all contrasts between younger and older children within this category. In general, contrasts between and within age categories enabled us to compare age groups with a wider and lower age difference and also to cross-validate the results, because the direction of development in prejudice between categories should also be reflected within categories.

Coding Procedure

We developed a detailed coding protocol to classify the research documents, studies, age contrasts, and dependent variables. On the level of research documents, we coded several document-specific variables such as the year and institute of

publication, type of document (i.e., journal article, book, or book chapter), or publication language. On the level of studies, we documented variables such as the year and country of sampling and whether participants lived in urban or rural areas. On the level of age contrasts, we looked at the following features:

Age, sex, and socioeconomic status of the sample. We coded the exact age and number of younger and older age children or—if not reported—information on their school grade. We then classified each younger and older group of children to an age category (see above), and determined which between- or within-age contrast fitted this unit of analysis. We also coded the percentage of girls and boys in the sample along with their socioeconomic status as either 1 (*lower class*), 2 (*predominantly middle class*), or 3 (*higher or upper class*).

In-group and out-group defining feature. We coded whether the in-group (sample) was defined by ethnic group membership (e.g., by language, culture, or religion), white or black skin color, or nationality (by citizenship). We classified the in-group according to the feature by which the sample was primarily defined (e.g., if a study measured national prejudice, the nationality of the sample represented the in-group even if the sample could also be classified by racial features). We classified the out-group in the same way, but this coding was operationalized as a descriptive feature of the dependent variable (see next).

Social status of the out-group. We coded the social status of the out-group in relation to the in-group in terms of relative social power and prestige (e.g., Tajfel, 1981). The in-group or out-group was defined as a social minority if the group was a typical target of prejudice or at least a stigmatized and disadvantaged social group in the relevant nation's history (e.g., Blacks or Native Americans; see Sidanius & Pratto, 1999). This information was based on the description of the social groups and intergroup problems in the primary studies, respectively. Hence, if the prejudice of children belonging to dominant in-groups (i.e., the social majority) was measured toward people belonging to oppressed or stigmatized out-groups (i.e., the social minority), the out-group was coded as having a *lower social status* (relative to the in-group). By contrast, when children belonging to a stigmatized in-group (social minority) evaluated members of a dominant out-group (social majority), the out-group was coded as having a *higher social status*. If no status differences between in-group and out-group were apparent (e.g., when children belonging to one social minority

evaluated other minorities), the out-group was coded as having *equal social status*.

Contact opportunities. We operationalized contact by contact opportunities. If reported, we coded the percentage of out-group members in the school and geographic area, and computed an index to represent opportunities for contact with the out-group. The proportion of out-group members in the school and the region in which the children lived was coded as 1 (*no opportunities*), 2 (*below 5%*), 3 (*below 25%*), 4 (*below 50%*), or 5 (*above 50%*). If any members of the out-group were to be found in either the school, the region, or both contexts, the coding was 2 or higher (i.e., contact opportunities given).

Validity rating. Following Cook and Campbell's (1979) validity concept, we rated methodological quality by assessing 25 threats to four validity dimensions: statistical validity (e.g., low reliability of measures, low sample size), internal validity (e.g., low comparability between age groups on, for instance, socioeconomic characteristics), construct validity (e.g., invalid measures of prejudice), and external validity (e.g., highly selective sample or context). We calculated a sum score of these threats across all dimensions, and classified studies as having a *high* (0–2 threats), *medium* (3–4), or *low* (5 and above) validity.

Prejudice as dependent variable. Our dependent variable was the mean difference in prejudice between two age groups of children or adolescents either within or between the constructed age categories (age contrasts). On the level of these dependent variables, we applied several additional codings: First, we recorded the *type of out-group* (white or black skin color, ethnicity, or nationality) and second, the *dimension of prejudice* (cognitive, affective, behavioral). According to the definition above, prejudice could be measured cognitively, if negative attributes were ascribed to the out-group (trait attribution); affectively, if a negative affect was felt toward out-group members (negative emotion); or behaviorally, if negative behaviors were exhibited or contact with the out-group was avoided (social distance). Third, these forms of negativity could be assessed according to *in-group dependence*. A *dependent* (or relative) measure refers to differences between in-group and out-group evaluations on a positive or a negative dimension. An *independent* (or absolute) assessment refers to the evaluation of out-group members on a *negative dimension* (e.g., dislike). By contrast, and in line with our prejudice definition, we did *not* integrate independent evaluations of the out-group on a *posi-*

tive dimension as a measure of prejudice, because these did not represent any operationalization of negativity. Fourth, we coded the prejudice measures according to the *type of assessment*, that is, if prejudice was assessed explicitly (e.g., by trait attribution) or implicitly (e.g., via IAT or nonconscious indirect measures). Finally, we coded the *stimulus material* used to activate the out-group category (linguistic, visual, auditory).

In some cases, multiple dependent variables were used to measure prejudice within one contrast (e.g., attitudes toward different out-groups or attitudes measured through different operationalizations). If this was the case, we coded all possible dependent variables and aggregated effect sizes to the level of age contrasts. If age differences in relation to particular operationalizations or out-groups were studied, we analyzed the effect sizes of the particular operationalizations or out-groups by aggregating the variables studied separately.

Computation and Analyses of Effect Size

Effect size calculation. Due to the low number of longitudinal studies, we meta-analyzed only the cross-sectional research. Results of the longitudinal studies will be summarized more qualitatively after reporting the results of the meta-analysis. We constructed the effect size as the standardized mean difference score in prejudice between a younger and an older age group (between- and within-age categories) using Cohen's *d* (Cohen, 1988). This was calculated by subtracting the mean prejudice score in the younger age group from the mean prejudice score in the older age group, and dividing this raw mean difference by the pooled standard deviation of both groups. To permit the calculation of effect sizes, studies had to report means and standard deviations as well as the number of participants in each age group. If the number of participants per age group was not reported, we estimated this by taking the total sample size and dividing it equally by the number of age groups. For studies reporting results in other metrics like correlations, beta coefficients, *F* scores, or frequency scores, we applied transformation procedures (see Lipsey & Wilson, 2001). If studies reported only a significant difference between age groups without reporting means and standard deviations (but including, of course, the directionality of this difference), we used the minimum *d* that would achieve that level of significance according to the given sample size. Studies reporting that a particular difference in prejudice

between age groups was not significant were assigned to zero ($d = 0$). Finally, one threat to the validity of independent operationalizations of age differences in prejudice is due to changes in evaluations of other persons with age that are independent of group membership. For example, if an older group evaluates the out-group more negatively than a younger group, but also the in-group more negatively than the younger group, it is questionable to treat the increase in out-group negativity as an increase in prejudice, because the increase in the negative evaluation seems to occur independently of group membership. Therefore, when age-related differences in evaluations independent of the group were apparent, the effect size was corrected by subtracting the standardized age differences in in-group evaluations from the standardized age differences in out-group evaluations.

Combining and comparing effect sizes across studies. To combine the effect sizes of each age contrast representing a difference in prejudice between two age groups, we estimated the weighted mean (population) effect size (Lipsey & Wilson, 2001). To further analyze the variability, we first determined whether each set of standardized mean difference scores shared a common effect size based on Hedges and Olkin's (1985) model by calculating the homogeneity statistic Q , which represents a measure of the compatibility of the variability in effect sizes with the assumption of one population effect size. If Q was not significant, the average effect size was taken to be homogeneous and to be an accurate representation of all contrasts. In these cases, a fixed-effects model was applied to calculate the population effect size. If the Q statistic was significant, the effect sizes were not homogeneous, and we used a random-effects model (Hedges & Vevea, 1998). In those cases in which the distribution of effect sizes was heterogeneous, we analyzed whether these moderators produced systematic variations in effect sizes.

Results

Descriptive Characteristics of Cross-Sectional Studies

Table 1 presents the characteristics of all 111 research documents reporting the results of 121 cross-sectional studies and 295 age contrasts (102 within- and 193 between-age categories). Most research documents had been published as journal

articles (89.2%), after 1990 (58.6%), and in English (92.8%). Samples of children and adolescents came from 18 different countries with the largest contribution from the United States (38.8%). On average, there were 166 participants in each age contrast. White skin color of the children was the main defining in-group characteristic in almost half of the age contrasts (48.5%), whereas Blacks were the most common out-group (40.3%). In addition, the majority of age contrasts (58.3%) addressed the prejudice of a higher status in-group toward a lower status out-group (social majority children's attitudes toward a minority).

The 295 age contrasts permitted 489 effect size calculations. The type and content of the dependent variables reported in the primary studies indicated that the majority of age contrasts (65.6%) used cognitive-oriented measures like trait attributions. However, a significant number of studies also applied behavioral (39.3%) and affective measures (20.7%). The most common method of measurement (75.3%) was psychometric tests like the Preschool Racial Attitudes Measure (PRAM II; Williams & Morland, 1976) or the Multiresponse Racial Attitude Measure (MRA; Doyle & Aboud, 1995). Implicit measures (e.g., IATs) were used rarely ($k = 37$). Visual stimulus material (drawings or pictures of out-group members) was applied more often than group labels alone to activate the out-group category (41% vs. 34%). Finally, dependent measures of prejudice comparing out-group evaluation with in-group evaluation were used more often than independent measures (66.4% vs. 38.6%). A more detailed overview of each research document is provided in Table S1.

Mean Effect Sizes by Age Contrasts

Table 2 reports the weighted mean effect sizes for all within- and between-age group contrasts. In general, we found a nonlinear developmental pattern in prejudice with relatively few significant results. The age contrasts between early (2–4 years) and middle (5–7 years) childhood revealed a significant increase in prejudice, $d = 0.29$, $p < .01$, with heterogeneous effect sizes, $Q = 80.9$, $df = 42$, $p < .01$. Studies investigating prejudice between children aged 5–7 versus 8–10 years showed a slight decrease in prejudice, $d = -0.11$, $p < .05$, again with significant heterogeneity, $Q = 281.7$, $df = 67$, $p < .01$. This decrease in prejudice between middle and late childhood could also be found within the 8–10 year category, $d = -0.17$, $p < .01$,

Table 1
 Characteristics of Research Documents, Studies, and Age Contrasts

Variable	<i>n</i>	%	Variable	<i>n</i>	%
Publication type ^a			Validity threats ^c		
Journal article	99	89.2	Low (0–2)	71	24.1
Book chapter	5	4.5	Medium (3–4)	127	43.1
Dissertation	4	3.6	High (≥ 5)	97	32.9
Unpublished manuscript	2	1.8	Main in-group feature ^c		
Master's thesis	1	0.9	White skin color	143	48.5
Year of publication ^a			Black skin color	34	11.5
1930–1949	3	2.7	Other ethnic groups	88	29.8
1950–1969	11	9.9	Nationality	30	10.2
1970–1989	32	28.8	Social status of out-group ^c		
1990–2008	65	58.6	Higher social status	56	19.0
Language ^a			Equal social status	51	18.2
English	103	92.8	Lower social status	172	58.3
Spanish or Catalan	4	3.6	Mixed	16	5.4
German	3	2.7	Contact opportunities ^c		
Italian	1	0.9	No contact opportunities	56	19.0
Country ^b	1		< 5% out-groups	66	22.4
United States	47	38.8	< 25% out-groups	82	27.8
Spain	15	12.9	< 50% out-groups	24	8.1
United Kingdom	13	10.7	> 50% out-groups	26	8.8
Israel	11	9.1	Not reported	41	13.9
Canada	9	7.4	Out-group ^d		
Australia, New Zealand	6	4.9	White skin color	44	14.9
Other	20	16.5	Black skin color	119	40.3
Sample size ^c			Other ethnic groups	119	40.3
< 50	49	16.6	Nationality	26	8.8
50–99	100	33.9	Dimensions of prejudice ^d		
100–249	102	34.6	Cognitive (trait attribution)	194	65.6
250–499	29	9.8	Affective (liking)	61	20.7
500–749	8	2.7	Behavioral (contact intent)	116	39.3
750–999	2	0.7	Assessment of prejudice ^d		
> 1,000	5	1.7	Explicit	271	91.9
Gender ^c			Implicit	37	12.5
Female	9	3.1	Stimulus material ^d		
Male	9	3.1	Visual (picture or photo)	122	41.4
Mixed	169	57.3	Label (story or question)	101	34.2
Not reported	83	36.6	Visual and label	65	23.4
Socioeconomic status ^c			Dependence of the measure ^d		
Lower class	57	19.3	Independent	118	38.6
Middle class	93	31.5	Dependent	196	66.4
Higher class	26	8.9			
Not reported	119	40.3			

^aBased on the number of documents ($N = 111$). ^bBased on the number of studies ($k = 121$). ^cBased on the number of age contrasts ($k = 295$). ^dBased on the number of age contrasts that could be constructed for each out-group or operationalization category (one age contrast could occur repeatedly).

suggesting that it was due mainly to changes in late childhood. All further age contrasts revealed no significant effects, but there were heterogeneous effect sizes in the 11–13 versus 14–16 year age contrast, $Q = 109.6$, $df = 27$, $p < .01$, and the 14–16 versus 17–19 year contrast, $Q = 49.7$, $df = 11$, $p < .01$.

The 17- to 19-year-olds revealed an increase in prejudice, $d = 0.40$, $p < .01$, but this result was based on only two age contrasts.

To make the patterns and magnitude of the meta-analytic results on developmental changes and age differences easier to follow, we present the

Table 2
Weighted Mean Effect Sizes in Age Differences for All Age Contrasts

Age contrasts (years)	<i>k</i>	<i>M_y</i>	<i>M_o</i>	<i>d</i>	<i>Q</i>
2–4	11	3.0	4.0	0.10	2.7
2–4 versus 5–7	43	3.9	5.9	0.29**	80.9**
5–7	41	5.6	6.8	0.00	76.8**
5–7 versus 8–10	68	6.3	9.2	-0.11*	281.7**
8–10	30	8.3	9.9	-0.17**	85.4**
8–10 versus 11–13	42	9.1	11.7	-0.07	204.6**
11–13	9	11.3	12.6	-0.06	7.1
11–13 versus 14–16	28	12.3	14.9	-0.05	109.6**
14–16	9	14.0	15.6	0.01	13.0
14–16 versus 17–19	12	14.7	17.4	0.04	49.7**
17–19	2	17.4	19.6	0.40**	0.8

Note. Positive effect sizes represent an increase in prejudice with age (older children have more prejudice than younger ones) and negative effect sizes a decrease (older children have less prejudice than younger ones). *k* = number of comparisons; *M_y* = mean age of younger group; *M_o* = mean age of older group; *d* = standardized weighted mean effect size (age difference in prejudice) between younger and older participants; *Q* = homogeneity statistics.

p* < .05. *p* < .01.

outcomes of effect size calculations as cumulative *d* values (see Roberts et al., 2006). Figure 1 depicts these cumulative *d* values for mean age differences in prejudice among children and adolescents from the between-age-group contrasts. These figures are based on the assumption that cross-sectional age differences in prejudice can be interpreted longitudinally as developmental changes, and that these changes are cumulative across the whole age span of childhood and adolescence. Note again, that Figure 1 reports *age differences* and not the *level of prejudice* (i.e., a cumulative *d* value of zero at age 3 does not mean that no prejudice existed). In general, age

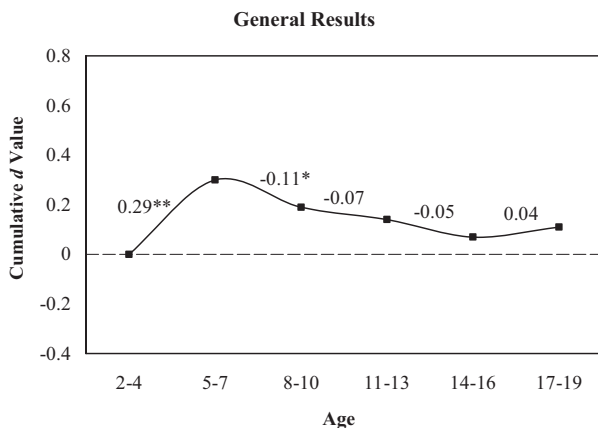


Figure 1. Cumulative *d* values for contrasts between age categories in prejudice toward all out-groups.

p* < .05. *p* < .01.

differences in prejudice seemed to follow a curvilinear pattern. The findings demonstrated a peak in prejudice in middle childhood and a slightly decreasing trend until late childhood. No age-related changes in prejudice of any practical significance could be found for adolescents. However, the results of the between-age-group contrasts showed significant heterogeneity, indicating that the developmental trend is not universal, but reflects the existence of important moderators of age differences.

Effect Sizes for Different Dimensions and Operationalizations of Prejudice

As a first moderator, we tested whether the developmental trend was consistent across different dimensions and operationalizations of prejudice. These data are presented in Table 3. There were positive effect sizes in the age contrasts between early (2–4 years) and middle (5–7 years) childhood that were largely independent from the different operationalizations of the outcome measures. Apart from this consistent result, significant decreases in prejudice between middle and late childhood (5–7 vs. 8–10 years) were found for explicit measures of prejudice, $d = -0.13$, $p < .05$; when cognitive measures (like negative trait attribution) were used, $d = -0.13$, $p < .01$; when the out-group attitude was operationalized as being dependent on the in-group evaluation, $d = -0.14$, $p < .01$; and when the out-group was activated by both visual stimuli (e.g., pictures of Blacks) and the verbal label of the out-group (e.g., Blacks), $d = -0.21$, $p < .01$. This decrease was particularly confirmed when age contrasts were based on the MRA as an explicit, cognitive, dependent measure using verbal and visual stimuli, $d = -0.58$, $p < .01$, $k = 9$. Further analyses revealed no systematic age differences or specific developmental patterns among adolescents, with the exception of a decrease in prejudice as assessed by implicit measures between early and midadolescence, $d = -0.36$, $p < .01$. However, this result was based on only three age contrasts.

In addition to these more methodological dimensions of the prejudice measures, the data could also be differentiated according to different out-group dimensions. In general, results revealed that age differences in prejudice toward Blacks and ethnic out-groups seemed to be quite different from age differences in prejudice toward Whites and national out-groups (e.g., British children vs. Germans). As in the general developmental course described earlier, prejudice toward Blacks and other ethnic

Table 3
Weighted Mean Effect Sizes Between Age Categories on Different Operationalizations of Prejudice

Age contrasts (years)	Operationalizations of prejudice measure											
	Dimension of prejudice			Assessment			Dependence on in-group evaluation			Stimulus material		
	Cognitive <i>d</i> (<i>k</i>)	Affective <i>d</i> (<i>k</i>)	Behavioral <i>d</i> (<i>k</i>)	Explicit <i>d</i> (<i>k</i>)	Implicit <i>d</i> (<i>k</i>)	Dependent <i>d</i> (<i>k</i>)	Independent <i>d</i> (<i>k</i>)	Visual <i>d</i> (<i>k</i>)	Visual and group label <i>d</i> (<i>k</i>)	Label <i>d</i> (<i>k</i>)		
2-4 versus 5-7	0.28** (30)	0.20** (5)	0.31** (20)	0.28** (41)	0.37** (6)	0.22** (36)	0.57** (10)	0.27** (25)	0.34** (18)	—		
5-7 versus 8-10	-0.13* (48)	-0.02 (13)	-0.12 (18)	-0.13* (57)	-0.03 (16)	-0.14** (53)	0.00 (16) ^a	-0.07 (29)	-0.21** (25)	-0.03 (14)		
8-10 versus 11-13	-0.03 (29)	-0.12 (9)	-0.10 (18)	-0.08 (37)	-0.04 (6)	-0.06 (27)	-0.06 (19)	-0.11 (13)	-0.09 (6)	-0.03 (21)		
11-13 versus 14-16	-0.03 (21)	-0.28 [†] (6)	0.00 (11)	-0.04 (27)	-0.36** (3)	-0.27 [†] (8)	0.01 (21)	0.15 (2)	-0.40 (2)	-0.04 (24)		
14-16 versus 17-19	0.13 (6)	—	0.04 (6)	-0.00 (11)	—	—	0.04 (12)	—	—	0.04 (12)		

^aContrasts with independent measures in this age group also used equal status out-groups more frequently. Analyzing only the comparisons with lower social status out-groups (*k* = 9) revealed a decrease in prejudice, *d* = -0.15, *p* < .01.
[†]*p* < .10. **p* < .05. ***p* < .01.

out-groups seemed to increase between early and middle childhood (2-4 vs. 5-7 years) with medium effect sizes, *d* = 0.33, *p* < .01, *k* = 24 and *d* = 0.27, *p* < .01, *k* = 11, whereas no significant increase was found for prejudice against Whites, *d* = 0.14, *ns*, *k* = 9. Furthermore, for Blacks and other ethnic out-groups, there was a decline between middle (5-7 years) and late (8-10 years) childhood, *d* = -0.31, *p* < .01, *k* = 32 and *d* = -0.19, *p* < .05, *k* = 21, and within late childhood, *d* = -0.33, *p* < .05, *k* = 10 and *d* = -0.20, *p* < .05, *k* = 16. By contrast, prejudice toward Whites seemed to increase between middle and late childhood, *d* = 0.26, *p* < .01, *k* = 11, whereas prejudice toward other national groups remained unchanged, *d* = 0.10, *ns*. Among adolescents, only low and negligible effect sizes were found, although this was sometimes based on a very low number of age contrasts. Thus, the general developmental pathway in prejudice as described in Figure 1 was based mainly on the results of prejudice toward Blacks and other ethnic out-groups (e.g., immigrants or natives) but differed for prejudice toward Whites or national out-groups. Because it remained unclear who was evaluating these out-groups (especially the ethnic out-groups), we analyzed characteristics of the sample, as well as the relationship between in-group (sample) and out-group, in more detail.

Effect Sizes by Study-Level Moderators

To investigate moderators of age-related changes, we used meta-analytic multiple regression analyses based on a mixed-effects model (Wilson, 2005). Multiple regression analyses are particularly appropriate for investigating the influence of both the social status of the out-group compared to the in-group (e.g., higher, equal, or lower status) and the contact opportunities between both groups as two particularly important predictors of prejudice. We analyzed these moderators of age differences in prejudice on the level of age contrasts while controlling for other variables: year of sampling, area in which the children were growing up (urban vs. rural), and the validity ratings of the studies. We were unable to include socioeconomic status, sex, and publication type in the moderator analysis, because there were either too many missing values or these moderators did not vary enough (see Table 1).

Table 4 presents the results of the meta-regression analyses with weighted standardized *betas*. A significantly positive *beta coefficient* representing a positive association between the specific moderator

Table 4

Weighted Standardized Regression Coefficients of Moderators of Prejudice Development Across Childhood and Adolescence (Meta-Regression Analysis)

Moderators ^a	Regression coefficients (β) by age contrasts					All ^b
	2–4 versus 5–7	5–7 versus 8–10	8–10 versus 11–13	11–13 versus 14–16	14–16 versus 17–19	
Country (United States)	–.11	–.16	–.07	.32	.24	.02
Area (urban)	.00	.00	.00	–.72*	.25	.05
Year of sampling	.00	.00	.00	.00	.00	.00
Validity threats	–.01	–.02	.00	.03	.03	–.01
Higher status OG	–.27*	.53**	.13	.31	—	.12**
Contact	–.30*	–.21*	–.04	.52	—	–.11*
Descriptive and homogeneity analyses						
<i>k</i>	36	55	38	25	12	254
<i>df</i>	6	6	6	6	4	6
Q_{Model}	12.6*	25.1**	1.4	11.2	4.0	15.9*
R^2	.28	.34	.04	.34	.45	.06

Note. OG = out-group.

^aEffects of prejudice toward higher status out-groups compared to equal and lower status groups (dummy coding). Contact = contact opportunities (1 = no contact opportunities, 2 = contact opportunities); Country (United States vs. other countries; dummy coding); Area (urban areas vs. suburban and rural areas); Year of sampling (chronological year); Validity threats (numbers of threats). ^bMean age of each age contrast was included in the regression as control variable. *k* = number of age contrasts. Q_{Model} = test statistic for the regression model based on the chi-square distribution. R^2 = variance in effect sizes explained by regression model.

* $p < .05$. ** $p < .01$.

and the effect size indicated a more intensive increase in prejudice with age (positive effect size) or a less intensive decrease in prejudice with age (negative effect size) when the moderating variable was present. This therefore denoted an unfavorable developmental trend. In turn, a negative beta coefficient marking a negative association with the effect size meant that an increase in prejudice with age (positive effect size) was less intensive or a decrease in prejudice with age (negative effect size) was more intensive when the moderating variable was present. This therefore represented a favorable developmental trend.

We first entered all contrasts between and within age categories into our metaregression model, and analyzed which variables were associated with age differences in general, irrespective of the age range. Because age was associated with some predictors (e.g., older studies investigated more younger children), we also entered the mean age of the samples in each age contrast to control for the effect of age on effect sizes (see Roberts et al., 2006). This overall regression model accounted for 6% of the variance, $Q = 15.9$, $df = 6$, $p < .05$, and revealed two significant moderators of the developmental course of prejudice: A higher out-group status was associated positively with effect sizes, $\beta = .12$, $p < .01$, whereas contact opportunities were associated negatively

with effect sizes, $\beta = -.11$, $p < .05$. Thus, a more unfavorable developmental trend was found when higher status out-groups were evaluated (e.g., Whites by Blacks in the United States), whereas contact opportunities with the out-group in either the school or the region were associated with a more favorable development overall. By contrast, other variables (area and country of conduct, threats to validity) had little or no influence on age differences when all age contrasts were regarded together.

We then applied the meta-analytic regression separately for each age contrast between age categories (it was not possible to perform moderator regressions because of the low number of comparisons within age categories and the homogeneity of most of these effect sizes). This revealed more differentiated results, and significant models could be confirmed for two of five age contrasts. First, the regression model for the age contrast between early (2–4 years) and middle (5–7 years) childhood significantly explained 28% of the heterogeneous effect sizes, $Q = 12.6$, $df = 6$, $p < .05$. The social status of the out-group, $\beta = -.27$, $p < .05$, and contact opportunities, $\beta = -.30$, $p < .05$, were identified as significant moderators of effect sizes in this age contrast. Post hoc analyses showed that age differences in prejudice toward higher status out-groups were nonsignificant, $d = 0.13$, *ns*, $k = 10$, whereas they

revealed a significant increase in prejudice toward equal and lower status out-groups between early and middle childhood, $d = 0.33$, $p < .01$, $k = 33$. Moreover, a significantly higher increase between early and middle childhood was found when children had no contact opportunities with the out-group, $d = 0.47$, $p < .01$, $k = 7$, compared to studies in which children had (at least 5%) contact opportunities, $d = 0.20$, $p < .01$, $k = 29$.

Second, the regression model between middle and late childhood (5–7 vs. 8–10 years) attained significance, $Q = 25.1$, $df = 6$, $p < .01$, explaining about 34% of the heterogeneity of the underlying effect sizes. Within this model, we found a positive association between higher out-group status and effect size, $\beta = .53$, $p < .01$, and a negative association between contact opportunities and age-related differences in prejudice, $\beta = -.21$, $p < .05$. Post hoc analyses of variance revealed that the prejudice of lower status children (e.g., Blacks) toward higher status out-groups (e.g., Whites) increased significantly at this age, $d = 0.31$, $p < .01$, $k = 11$, whereas the prejudice of higher status children toward lower status out-groups declined, $d = -0.22$, $p < .01$, $k = 38$. In addition, whereas contact opportunities led to a decrease in prejudice, $d = -0.15$, $p < .01$, $k = 39$, no age-related changes were found when contact opportunities were absent between middle and late childhood, $d = -0.04$, ns , $k = 16$. The regression models for the other age contrasts revealed no significant results.

In sum, the social status of the out-group and contact opportunities were confirmed as major moderators in age-related changes in prejudice until the age of 10, whereas no moderators of effect sizes could be found for adolescence. Figures 2a and 2b illustrate this result through cumulative d values of age differences in prejudice toward higher

and lower status out-groups. Prejudice increased until middle childhood and decreased between middle and late childhood when lower status out-groups were evaluated, whereas prejudice against higher status out-groups increased only between middle and late childhood. Regarding the moderator effect of contact opportunities, a more detailed analysis revealed no effect of contact opportunities for higher status and equal status out-groups in any age contrast. Thus, the moderating effect of contact opportunities reported earlier is not universal. It is found only for prejudice toward lower status out-groups. Figures 3a and 3b illustrate the cumulative effect sizes for prejudice toward lower status out-groups depending on contact opportunities. Whereas prejudice toward lower status out-groups increased intensively between early and middle childhood when children had no contact opportunities, $d = 0.74$, $k = 4$, $p < .01$, the increase was significantly less intensive when contact was present, $d = 0.23$, $k = 21$, $p < .01$, and also decreased between middle and late childhood, $d = -0.28$, $k = 27$, $p < .01$. We conducted a more detailed analysis of the different levels of contact opportunities in the age contrasts early versus middle childhood and middle versus late childhood. Figure 4 shows that more contact opportunities had an almost linear association with a lower increase in prejudice between early and middle childhood and a higher decrease in prejudice between middle and late childhood. In particular, we even found the decrease in prejudice toward lower status out-groups in the 5–7 versus 8–10 year category when contact opportunities were low (around 5%), $d = -0.20$, $k = 7$, $p < .10$. This result suggests that even very few contact opportunities were associated with a more favorable developmental trend in prejudice in both age contrasts.

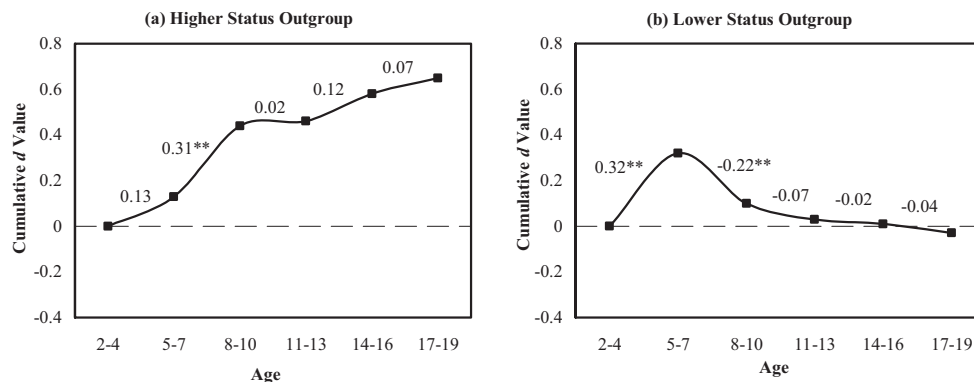


Figure 2. Cumulative d values for contrasts between age categories in prejudice toward out-groups with higher (a) and lower (b) social status compared to the in-group.

** $p < .01$.

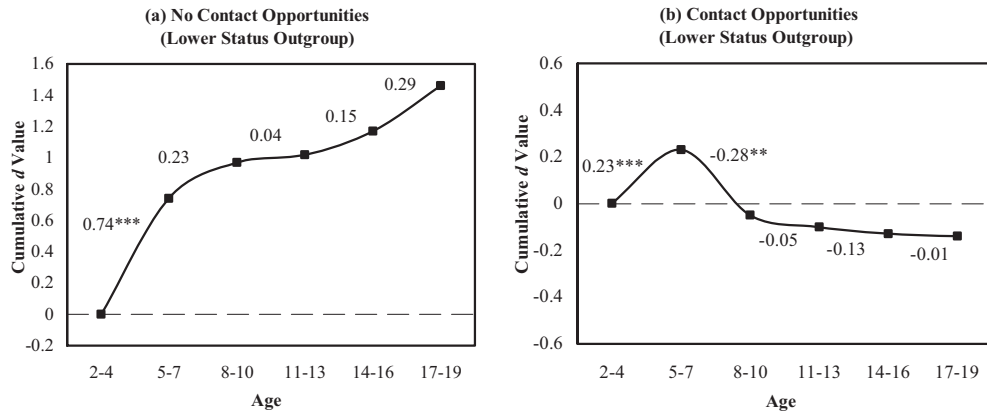


Figure 3. Cumulative *d* values for contrasts between age categories in prejudice toward lower status out-groups with (a) and without (b) contact opportunities. ***p* < .01. ****p* < .001.

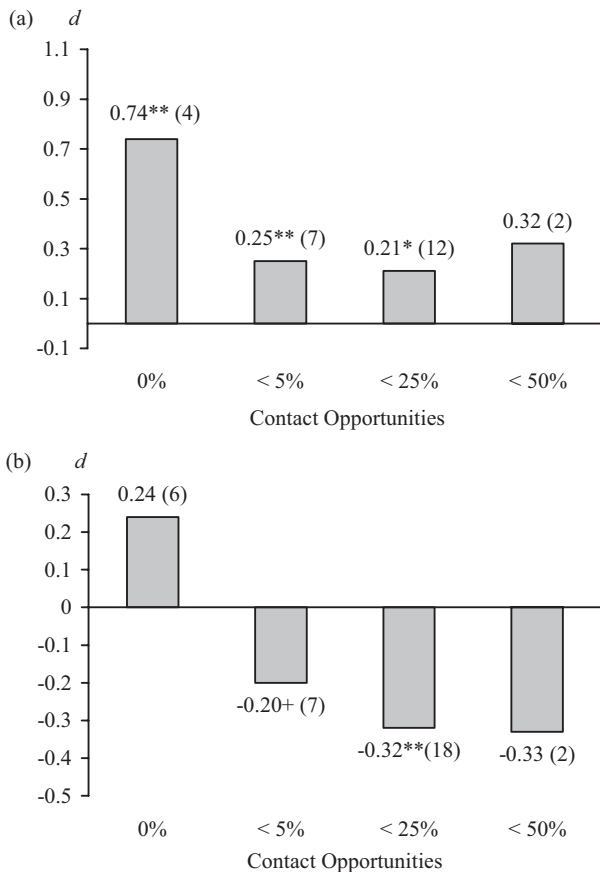


Figure 4. Effect sizes for age differences in prejudice toward lower status out-groups between early (2–4 years) and middle (5–7 years) childhood (a) and between middle (5–7 years) and late (8–10 years) childhood (b). +*p* < .10. **p* < .05. ***p* < .01.

It should be noted again that, due to our construction of age contrasts, we were not able to standardize the *absolute level of prejudice* at a certain age,

but only express relative differences between age groups. However, we tried to estimate this level by setting the mean scores on each dependent variable in relation to the possible maximum and minimum scores of the respective prejudice scales. We were able to calculate this score for about two thirds of all dependent variables. The value -1.0 corresponds to the most negative evaluation (prejudice) score attainable; zero, a neutral evaluation; and $+1.0$, the most positive evaluation of the out-group attainable on each scale. Over all age contrasts and dependent variables, we found a mean score of -0.2 , showing that children and adolescents in all age groups showed at least some degree of negativity toward members of social out-groups that could be regarded as prejudice. However, within these analyses, we again found some developmental variability related to the social status of the children. Minority children evaluated the higher status out-groups positively or at least neutrally until the age of 7 (mean scores of 0.15 and -0.02 in early and middle childhood), but showed a substantial amount of negativity from late childhood onward (mean score of -0.23 and lower at age 8 and beyond). Majority children, by contrast, already showed negativity toward lower status groups in early childhood (mean score of -0.22). Again, this is only a very rough estimation for the absolute level of prejudice, but it confirmed our finding that prejudice toward lower status groups is, in general, more pronounced than prejudice toward higher status out-groups.

Longitudinal Studies

Overall, we found five research documents reporting the results of seven studies investigating

Table 5
Study Characteristics and Effect Sizes of Longitudinal Studies

Study	Country	In-group	Out-group	<i>N</i>	Age T1	Age T2	Contact	<i>d</i>
Branch and Newcombe (1986)	United States	Black	White	25	4	7	—	0.00
Doyle and Aboud (1995)	Canada	White	Black	47	6	9	Yes	-0.83
			Native Indians				No	-0.67
McAdoo (1985)	United States	Black	White	43	5	10	No	0.77
	United States	Black	White	68	5	6	Yes	0.00
	United States	Black	White	35	5	10	Yes	1.57
Pushkin and Norburn (1983)	United Kingdom	White	Black	172	4	12	No	0.29
Urban and Singelmann (1998)	Germany	Natives	Immigrants	131	15	17	No	0.05

Note. Age T1 = age of children at first time of measurement; Age T2 = age of children at second time of measurement; Contact = contact opportunities (> 5% out-group members in school or area); *d* = pre-post effect size in prejudice. This effect size was calculated by subtracting the mean of the prejudice scores at Time 2 from the mean at Time 1 and dividing this mean difference by the standard deviation of the raw scores at the first timepoint.

prejudice among children and adolescents longitudinally over a minimum of 1 year (see Table 5). Because they differed extremely in their age ranges, they are evaluated only descriptively here.

In general, longitudinal results seemed to be consistent with cross-sectional findings. In Doyle and Aboud's (1995) longitudinal study, prejudice of White children toward Blacks and Native Americans decreased between middle and late childhood, $d_s = -0.83$ and -0.67 . However, this decrease was not found in the prejudice of Black children toward Whites (Branch & Newcombe, 1986; McAdoo, 1985). Moreover, McAdoo (1985) found an increase in the prejudice of Black children toward Whites between the ages of 5 and 10 years, $d = 0.77$. Finally, Urban and Singelmann's (1998) longitudinal study also showed no age-related changes in prejudice among adolescents. Thus, the few longitudinal studies seemed to support our meta-analytic results gained from the cross-sectional studies.

Discussion

The aim of this meta-analysis was to investigate developmental trends in prejudice by integrating empirical studies on age differences in ethnic, racial, or national prejudice among children and adolescents. We integrated 113 research documents reporting the results of 121 cross-sectional and 7 longitudinal studies, and found that prejudice increases between early (2–4 years) and middle (5–7 years) childhood and then decreases slightly between middle (5–7 years) and late childhood (8–10 years) as well as within late childhood, whereas no general age trend can be confirmed in adolescence (10 years and later). In sum, age-related

changes in prejudice seem to be limited to childhood only and the heterogeneity of the relatively low numbers of studies on adolescents currently do not indicate any systematic prejudice development above the age of 10 years.

In general, our data support the inverted U-curve in the development of prejudice in childhood (see Figure 1)—as already assumed in the literature (see Brown, 1995). However, this curve masks large heterogeneity in age-related changes in prejudice, which can be explained in this meta-analysis by the specific operationalizations of prejudice (explicit prejudice measures), the social status of the out-group and the contact opportunities with out-group members. Thus, age-related changes in children's prejudice occur systematically and follow a predictable course when taking the different facets of prejudice and the features of the social environments into account. The increase in prejudice toward lower status out-groups between early and middle childhood especially can be regarded as a normal change (Arthur et al., 2008), because it is a persistent finding in our work that was obtained independently of contact opportunities and the divergent operationalizations of prejudice (see Table 3 and Figure 3) across a large pool of studies from different social contexts.

Regarding the divergent facets of prejudice, our meta-analyses found specific age-related changes. Thus, a decrease in prejudice between middle and late childhood only occurred in studies using explicit prejudice measures, whereas measurements of implicit attitudes revealed no age-related change between middle and late childhood (e.g., Banaji et al., 2008; Baron & Banaji, 2006). This supports the notion that children at this age start to control their prejudiced responses (Rutland, Brown, et al., 2007) and consciously evaluate different social groups

equally in line with social norms of equality (Monteiro, de França, & Rodrigues, 2009). By contrast, implicit prejudice does not decline in elementary school age, probably because it is highly automatized and more resistant to developmental changes and age-related influences (Banaji et al., 2008; Degner & Wentura, 2010). Thus, prejudice seems to change from explicit expressions to more implicit forms in elementary school age (Fazio & Olson, 2003) and the divergent results between explicit and implicit measures correspond to current developmental research, suggesting that implicit and explicit prejudice measures become more differentiated over time (Arthur et al., 2008). Moreover, we found a decrease in primary studies using cognitive measures such as negative trait attribution (e.g., MRA), measures activating the out-group category through visual stimuli and the group label (see Table 3), or measures predominantly operationalizing prejudice by the difference between out-group and in-group evaluation. These findings underline that children consciously begin to evaluate different groups as being equal in late childhood (Monteiro et al., 2009), which was indicated most strongly for conscious cognitive evaluations, when the out-group was highly salient, or when in- and out-group were evaluated directly.

Further, we found that prejudice toward national out-groups did not change between middle and late childhood (e.g., Barrett, Wilson, & Lyons, 2003; Reizábal, Valencia, & Barrett, 2004), whereas prejudice toward Blacks as well as toward other ethnic or racial groups decreased. Several possible explanations support the idea of strong influences of the social environment here: National out-groups mostly had an equal social status in our analysis (at least in our study sample, see Table S1), contact opportunities with national out-groups across countries are generally lower compared to minorities within a country, and social norms of equality and antiracist norms are communicated more often toward ethnic and racial groups than toward national groups (Crandall, Eshleman, & O'Brien, 2002). In sum, the meta-analysis also showed differences in age-related changes between national and ethnic prejudice, supporting the notion that prejudice becomes more differentiated and increasingly multifaceted with age.

Going beyond the findings on various facets and operationalizations of prejudice, several results of this meta-analysis also demonstrate heterogeneous developmental pathways for the social status of the out-group compared to the in-group. First, whereas prejudice toward higher status out-groups

(e.g., prejudice of Blacks toward Whites) did not differ systematically between early and middle childhood, prejudice toward lower status out-groups increased. Probably, as Banaji et al. (2008) have suggested, children at this age start to observe positive events happening to majority group members and negative events happening to minority group members (see also Bigler & Liben, 2007). Based on these experiences, they learn explicitly or implicitly to view disadvantaged minority groups negatively and majority advantaged groups positively, even if they belong to the minority group themselves and consequently show no negative evaluation of the higher status out-group. Furthermore, prejudice toward higher status out-groups increases between middle and late childhood, while prejudice toward lower status groups remains unchanged or decreases. This increase in prejudice of social minority children toward majorities can be explained either by experiences of discrimination and victimization at school entrance (Verkuyten, 2002) or the negative consequences of metastereotypes and expectancies of stigmatization resulting from increased sociocognitive abilities (see McKown & Weinstein, 2003). In either case, this meta-analysis revealed that social status is a major socioenvironmental variable that influences the development of prejudice in childhood.

The same result holds for contact opportunities with out-group members. If children were growing up with lower status out-group members, we found that prejudice increases significantly less intensive between early and middle childhood and decreases during elementary school age (middle vs. late childhood; see Figure 3). These positive effects of contact opportunities were already present when the proportion of out-group members in the school or region was only 5%. Even slight contact opportunities in the school seem to be enough to foster a decrease in prejudice by, for example, diminishing feelings of anxiety and unfamiliarity toward the out-group (Stephan & Stephan, 2000), reducing the salience of out-group membership (Bigler & Liben, 2007), enabling a perception of out-group heterogeneity (Aboud, 2003), or facilitating a common in-group identity (Gaertner et al., 2008). In addition, we found that prejudice toward lower status out-groups (predominantly ethnic and racial out-groups) decreased gradually with increasing contact opportunities (see Figure 4). This corresponds to results in the Tropp and Prenovost (2008) meta-analysis demonstrating that higher levels of contact are gradually associated with lower prejudice levels among majority children, whereas no

effects are found for minority children. Our data complement these results, by showing that this pattern can also be applied for age-related changes in prejudice. However, some authors suggest that high exposure to lower status out-groups (e.g., 50% of the population) could also inhibit real contact through friendship segregation (see Cillessen & Borch, 2008; Moody, 2001). We do not have enough data to examine the effects of large contact opportunities with a lower status out-group. In addition, segregation is probably more salient in adolescence, because younger children usually have fewer options to select their own environments (Scarr & McCartney, 1983). Regardless of this negative effect in highly heterogeneous settings, and even if the cognitive-developmental or contextual processes remain unclear in detail, contact opportunities do not simply reinforce a normal age-related decrease between middle and late childhood. Far more contact seems to be a necessary condition for these age-related changes.

Looking at the comparative importance of different age periods, the results suggest that the transition from middle to late childhood (7–10 years) is a sensitive period for environmental influences on prejudice (Cameron, Alvarez, Ruble, & Fuligni, 2001; Granic & Patterson, 2006). In contrast to the age differences between early and middle childhood, the divergence of developmental pathways in this age period was considerably higher, because—depending on social status and contact opportunities—we found both increases and decreases at this age. We assume that it is particularly the absence of a decline that may have dramatic consequences for further developmental pathways: When children have no contact opportunities, their social information processes for perceiving and recalling stereotype-consistent information in their environment may stabilize (Bar-Tal & Teichman, 2005; Bigler & Liben, 2006; Corenblum, 2003), they may become less willing to seek situations in which they have contact with out-group members (Shelton & Richeson, 2006), and they may actively avoid future social contact situations (Bar-Tal, 1996; Levin, Van Laar, & Sidanius, 2003). This makes a reduction of prejudice through positive contact experiences increasingly unlikely. These trends are reinforced as children become more independent from their parents and the family toward the end of childhood and start actively choosing their social contexts and the persons they want to spend their time with (Lerner & Busch-Rosnagel, 1981). Therefore, our results imply that a decline in prejudiced attitudes in this age period is

of major importance for developmental predictions in adolescence.

Furthermore, our meta-analysis has some implications for developmental theories of intergroup attitudes and prejudice. Because we found that developmental pathways of prejudice become more divergent in late childhood due to environmental factors, and that systematic age differences are absent in adolescence, none of the theories of prejudice are sufficient by themselves to explain prejudice development among children. While systematic age differences can be found in childhood, age-related differences among adolescents are only found within single studies (see Table S1), suggesting that changes in prejudice may become more dependent on the specific social environments and microcontexts in which adolescents are growing up (Rutland et al., 2010; Smetana, 2006). Therefore, the empirical studies summarized in this meta-analysis show that prejudice becomes a more domain-specific and context-dependent phenomenon within the course of development toward adolescence. The second implication is that although most of the recent research on prejudice in children and adolescents makes significant contributions to explaining the emergence of prejudice among children (e.g., Abrams & Rutland, 2008; Nesdale, 2000), it neglects factors explaining systematic changes in prejudice or its maintenance over time *at a given age*. One exception is Bigler and Liben's (2007) maintenance and revision model suggesting that prejudice develops as a self-reinforcing process (see above). There is a need for more models of this kind that explain the changes in and stability of prejudice at a certain age, even when prejudice is conceptualized as a multifaceted and domain-specific construct. In general, a more developmental orientation could contribute to the research field and to existing theories on prejudice. The results of this meta-analysis can be viewed as a first step toward such an orientation. They also suggest the need for a theoretical focus on the intraindividual stability of prejudice as well as interindividual differences within its development.

Our analyses also have implications for developmental interventions. First, the data indicate the importance of children's age—not only for selecting age-appropriate intervention methods but also for the timing of interventions. Interventions in late childhood seem to be particularly important due to the permeability of prejudice development at this age. Second, our data suggest that efforts to enhance the social status of minority groups (e.g., by diversity management strategies) or to avoid

stigmatization in society may help to reduce prejudice development among young children. Third, contact-based interventions prove to be an especially important way of facilitating a decrease in prejudice between middle and late childhood (Paluck & Green, 2009; Pettigrew & Tropp, 2006). Fourth, our results also imply that prevention programs may be more useful in racially and ethnically homogeneous areas in which children have few contact opportunities with out-group members, because low contact opportunities seem to be a risk factor for an escalating prejudice development. However, any contact-based programs in areas in which out-group members are absent naturally raise some implementation problems. One pragmatic solution is extended contact interventions (Wright, Aron, McLaughlin-Volpe, & Ross, 1997). Prevention trials with children have shown at least some promising results here (Beelmann, Saur, & Ziegler, 2008; Cameron, Rutland, Brown, & Douch, 2006). Finally, overt expressions of social norms could have particularly positive results. As Monteiro et al. (2009) showed, not only a stronger communication of antiracist norms but also a more direct expression of norms on equality contribute to a decline in prejudice between middle and late childhood.

Our analyses also have some implications for further research. Most obviously, more longitudinal research is required to study changes in prejudice with age as well as interindividual differences in intraindividual prejudice development. Also, further research should take a closer look at changes in prejudice in adolescence, because the number of studies is quite low. In addition, due to the few studies investigating changes in prejudice of social minority children toward higher status groups, more research is needed not only for investigating prejudice development among minority children but also for investigating differences between diverse social minority groups in their prejudice development.

Looking at methodological variables, more multimethod studies are necessary in face of the differences in developmental trends by the operationalizations of prejudice. For example, our descriptive analyses showed that studies using auditory stimuli to activate out-group membership (e.g., hearing people talking in a foreign language) are a rarity (e.g., Durkin & Judge, 2001). Because language is a more distinctive marker for nationality than physical attributes (e.g., for differentiating between French people and Germans), future studies should use language (with children listening to

a recording and then rating the people they hear) as a marker for out-group activation. This is especially important because language differences may provide a real barrier to interaction in daily life. As a further implication, future empirical research should use prejudice measures reflecting an in-group-independent, but out-group-specific negative reaction (see, e.g., Rutland, 1999). This could overcome the validity problems of most measures, which either are in-group-dependent measures, where one score reflects the attitudes toward two groups (the in- and out-group) or they are in-group independent measures but the group specificity of the negative evaluation is not ascertained.

Of course, it is necessary to consider some of the limitations of our meta-analysis. Our analysis of age-related changes by integrating cross-sectional studies and contrasting different age groups could potentially be biased by cohort differences, which would threaten a longitudinal interpretation of age differences as developmental changes (see Mekos & Clubb, 1997; Wilson, 1996). However, the age difference between and within our age contrasts was < 3 years, and we included studies covering more than 50 years of research. In addition, we found no relation between the publication year and age-related differences. Therefore, it seems unlikely that our results are based on systematic cohort effects.

Furthermore, we had no sophisticated way of quantifying the absolute level of prejudice within a certain age due to our age group-contrast procedure. However, at least our estimations of the prejudice level based on the available scale ranges of the assessment instruments clearly revealed that children and adolescents show prejudice at every age—except for the notable absence of prejudice in minority children before elementary school age. They also showed that the age-related differences are based on substantial absolute or relative negativity toward an out-group. Further, due to our integration of studies with dependent measures, operationalizations of prejudice in some studies were similar to in-group bias (Brewer, 1999), but our data indicate that the difference between both operationalizations of prejudice is less extreme than the literature would suggest (e.g., Aboud, 2003)—at least when it comes to investigating the developmental course of prejudice.

Moreover, one could question our operationalization of contact-by-contact opportunities. Although contact opportunities do not necessarily determine real contact between children and adolescents (Moody, 2001), they are, nonetheless, a necessary precondition. Thus, if increasing contact experiences

exert some influence on the development of prejudice, age-related changes in prejudice should not differ for those children who have, de facto, no contact opportunities.

Another point to be acknowledged is the possibility that the high number of age contrasts and the quantity of statistical analyses within this meta-analysis make some results susceptible to alpha-error accumulation. We have tried to address this problem by summarizing all age contrasts in the regression model and only interpreting results based on a substantial number of primary studies.

Although publication bias is a major problem in meta-analyses (Beelmann & Lipsey, in press), funnel plot analyses did not reveal any systematic biases in the publication of studies with significant effect sizes, and we also found no differences in results between published and unpublished studies. Moreover, in contrast to evaluation studies in intervention research, no systematic desirability can be expected for results on age differences.

Additionally, we were unable to code some further important variables that could explain our results such as the salience of the out-group or social classification skills. Such variables depend mainly on the particular social context of the sample (see, concerning salience, e.g., Bigler & Liben, 2006) and cannot be coded inferentially by the meta-analyst without concrete information from primary studies.

At last, we investigated only mean-level differences in prejudice and are therefore unable to draw conclusions on intraindividual developmental pathways. Thus, even if no age-related mean differences existed between two age groups, one portion of the children may have been experiencing an increase in prejudice, whereas the other portion was experiencing a decrease. Therefore, this meta-analysis can only be a first step toward a more detailed approach to the different pathways in prejudice development.

Research on the development of prejudice now has a relatively long scientific history. This meta-analysis has summarized and integrated at least an important part of the findings on age differences and developmental trends that have accumulated over the last 90 years, demonstrating that some systematic age-related changes in prejudice among children do exist. We could also show heterogeneity in these age-related changes, which is partially due to the divergent operationalizations and facets of ethnic, racial, and national prejudice, amplifying the domain-specific character of prejudice develop-

ment. Further, our data especially confirm that the social status between in-group and out-group is a major social-environmental factor in the development of prejudice and that contact opportunities in childhood have a beneficial effect on developmental changes in prejudice toward lower status out-groups. Future developmental research should go beyond age differences and apply prospective longitudinal designs in a systematic study of factors accounting for intraindividual stability or change and for interindividual differences. This will lead to a fuller understanding of the development and prevention of highly problematic intergroup attitudes such as racism or others forms of extremely negative intergroup evaluations.

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Supporting Information

Additional Supporting Information may be found in the online version of this article:

Table S1. Characteristics of the cross-sectional studies included in the meta-analysis.

Appendix S1. References of cross-sectional studies included in the meta-analysis.

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