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EMPIRICAL ARTICLE

CHILD DEVELOPMENT

Relations between early majority language and socioemotional development in children with different language backgrounds

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Abstract

This study explored whether the directionality of the relation between majority language and various facets of socioemotional development (three to 5 years old) differs between children with different language backgrounds. 12,951 children (49% girls; 85% White, 6% Pakistani and Bangladeshi, 3% Black, 3% Mix, 2% Indian) from the British Millennium Cohort Study (2001–2006) were included in two-time-point cross-lagged analyses. Models controlling for important covariates found a bidirectional association for monolinguals (βs = .05, −.07, −.04), a unidirectional effect of majority language on socioemotional difficulties for dual language learners (DLLs) speaking English and minority language(s) at home (β = .14), and a unidirectional effect of socioemotional strength on majority language for DLLs speaking only minority language(s) at home (β = −.17).

Early language acquisition is embedded in a series of social interactions with adults and peers; at the same time, socioemotional development which facilitates effective social interactions is deeply influenced by the process of language acquisition (Schieffelin & Ochs, 1986). Both language and socioemotional development are important domains that impact children's later academic success and well-being (Klein & Englund, 2021; Pace et al., 2019; Yew & O'Kearney, 2013). As the acquisition of early language and socioemotional skills largely depends on family contexts and particularly on the quality and quantity of language exposure to minority and majority languages (Rogoff, 2003; Tomasello, 2003; Vygotsky, 1978), it remains unclear whether the relation between children's language and socioemotional development differs between monolinguals (i.e., children who are only exposed to and only speak the majority language of the society) and dual language learners (DLLs; i.e., children who are not only exposed to and do not only speak the majority language). Understanding how children with a migration background develop becomes more and more crucial as the number of immigrants increases worldwide. Taking the UK as an example, more than 30% of British children are exposed to (at least) one minority language in addition to the majority language (Office for National Statistics, 2020).

Although theoretical approaches indicate a potential bidirectional association between these two domains (Bruner, 1983; Schieffelin & Ochs, 1986; Tomasello, 1992), previous studies have revealed mixed findings concerning this association—that is, some found unidirectional effects either from (majority) language skills to socioemotional skills or the reverse, others found bidirectional or even no interrelation between them (e.g., Barnett et al., 2012; Girard et al., 2017; Petersen et al., 2013). Moreover, those studies have typically either focused on children with a specific language status (monolingual or bilingual sample; e.g., Ertanir et al., 2021; Paavola-Ruotsalainen et al., 2018; Ren et al., 2016; Ziv, 2013) or failed to consider this language-related heterogeneity (e.g., Girard et al., 2016, 2017). The impact of children's different language backgrounds on the association

Abbreviations: BSRA-R, Bracken School Readiness Assessment-Revised; CASMIN, Comparative Analysis of Social Mobility in Industrial Nations; CFI, comparative fit index; DLL, dual language learner; ECEC, Early Childhood Education and Care; EM, English and minority language(s); FIML, full information maximum likelihood; MCS, Millennium Cohort Study; ML, minority language(s); MOEN, monolingual English children; RMSEA, root mean squared error of approximation; SDQ, Strengths and Difficulties Questionnaire; SRMR, standardized root mean squared residual.

between these two domains is thus essentially unexplored. In addition, as DLLs' language skills largely depend on language exposure and usage of each language (Tomasello, 2003), DLLs are unlikely to be a homogenous group when it comes to their majority language skills. Thus, drawing on a nationally representative sample from the UK, this study investigated the longitudinal association between majority language and socioemotional development among monolinguals and DLLs when controlling for the prior level of children's outcomes (at age 3). Furthermore, we explicitly considered the heterogeneity in DLLs and differentiated two DLLs groups, that is, *English and minority language(s) DLLs* (EM-DLLs; who speak both majority and minority languages at home) and *minority language predominant DLLs* (ML-DLLs; who exclusively speak the minority language at home), to compare with *monolingual English children* (MOEN; who exclusively speak the majority language at home).

Moreover, because children's development results from the interactions of individuals and their environmental context (Bronfenbrenner & Morris, 2006), we also considered theoretically and empirically well-documented influential factors as control variables when investigating the underlying developmental relations, that is, family's socioeconomic, educational, and cultural background, extrafamilial Early Childhood Education and Care (ECEC) attendance, and child's sex.

Association between language and socioemotional development

From the perspective of the social-pragmatic view of language development and social learning, language acquisition relies on, but is not limited to, the basic processes of social learning (Tomasello, 1992). Diverse social interactions with more skilled caregivers or peers (e.g., in play situations) provide children with language stimulations that promote their language acquisition (Bruner, 1985). Socioemotional development involves a variety of social and emotional skills as well as the potential emergence of difficulties underlying children's socioemotional behavior. These skills or difficulties could, among others, enable or impede children's flexible and appropriate responses in social interactions. Thus, socioemotional development covers positive behavior, such as prosocial behavior, as well as the risk of developing socioemotional difficulties, such as conduct problems and hyperactivity (as externalizing problems), emotional problems (as internalizing problems), and peer relationship problems (Halle & Darling-Churchill, 2016). Presumably, socially competent children, for example, children who exhibit more prosocial behavior and are able to establish positive relationships with peers, might tend to boost their language acquisition by constantly promoting effectiveness in social interactions (Rose-Krasnor, 1997). In contrast, children with aggressive behavior, inattention, or emotional problems may have less chances to participate in language-based exchanges with others; this could decrease their exposure to language and opportunities to produce language (Erdemir & Brutt-Griffler, 2022).

At the same time, a range of language behaviors has been shown to be important for children's successful participation in everyday social life. Language skills provide children with the essential means of communication and self-regulation to facilitate social interactions; thus, developing language skills is often considered as a social skill (Bruner, 1983). In particular, language allows children to express their needs, improve their emotion expression knowledge, better communicate with others, and solve social conflicts verbally (e.g., Keenan & Shaw, 2003; Schultz et al., 2001). If children's language skills are limited, they might have difficulty expressing themselves and, thus, be easily misunderstood by peers leading to peer rejection and a higher risk of aggressiveness or hyperactivity (Huang, Weinert, Wareham, et al., 2022; Menting et al., 2011; Petersen & LeBeau, 2021; Rose et al., 2022). This decreases their likelihood to establish good peer relationships. Furthermore, language skills help children to learn and moderate their behaviors and emotions (Schultz et al., 2001). In particular, self-regulating abilities can guide children's behavior in difficult situations using private speech (e.g., anger management; Salmon et al., 2016; Vygotsky, 1962). Both communication and verbal self-regulating skills contribute to socioemotional development. In addition, more advanced language skills may also help children to better understand others' perspectives and feelings, which may trigger prosocial behavior (Durkin & Conti-Ramsden, 2007; Huang, Weinert, von Maurice, et al., 2022; Imuta et al., 2016).

In this regard, the association between children's language and socioemotional development has been suggested to be reciprocal. Relying on these theoretical backgrounds, a number of empirical studies have examined the association between children's language and socioemotional outcomes. Overall, studies with typically developing children have shown an association between these two domains in early childhood. Although some of these studies documented a longitudinal relation between monolingual children's early socioemotional development and their later language skills (Paavola-Ruotsalainen et al., 2018; Ziv, 2013), they often failed to control for children's prior levels of language skills. This severely limits the conclusion that children's socioemotional development actually has an effect on their language skills, as the association of early socioemotional outcomes with later language skills could reflect the opposite direction of effect from language to socioemotional outcomes (i.e., the lagged association could be due to the stability of language skills) and vice versa. At the same time, evidence based on samples of young children with

language impairment or with different language backgrounds suggests a longitudinal effect of children's early majority language skills on their later socioemotional outcomes (e.g., Forrest et al., 2018; Hartas, 2011; Huang, Weinert, von Maurice, et al., 2022; Petersen & LeBeau, 2021; Rose et al., 2018; Salmon et al., 2016; Yew & O'Kearney, 2013). For example, children with language impairment have been found to have more socioemotional problems (Forrest et al., 2020) and less prosocial behavior than children without language impairment (Toseeb & St Clair, 2020). In particular, studies controlling for prior levels of children's socioemotional outcomes provided robust findings that children with advanced language skills at preschool age were comparatively more likely to be cooperative and get along well with other children at later time points (Petersen & LeBeau, 2021; Rose et al., 2018).

Studies which simultaneously examined both directions of effect while controlling for children's prior level of outcomes, however, have often found different patterns of results. Some longitudinal studies demonstrated either a unidirectional association (i.e., from language to socioemotional outcomes or the other way around; Ertanir et al., 2021; Girard et al., 2017; Rose et al., 2016) or a bidirectional association between these two domains (Girard et al., 2014, 2016; Petersen et al., 2013), while some research could not provide evidence for a significant relation between them (e.g., Barnett et al., 2012). Notably, while children's language skills were mainly measured by vocabulary in those studies, children's socioemotional development has been assessed very differently across studies, for example, by children's positive behavior, socioemotional difficulties, or a compound indicator (i.e., aggregating various facets of socioemotional development). When differentiating these facets, many findings indicated a unidirectional effect of language on positive behavior (e.g., prosocial behavior; Girard et al., 2017). Yet, most studies that focused on socioemotional difficulties have documented a bidirectional association (e.g., Petersen et al., 2013) while some did not (e.g., Rose et al., 2016). Thus, as the emergence of socioemotional difficulties does not hinder the presence of socioemotional skills, considering different facets of socioemotional development is essential to provide a comprehensive understanding of the association between children's language and socioemotional development.

Furthermore, most of these studies did not differentiate between children with various language backgrounds, that is, some (or even all) of the children spoke a minority language other than the majority language of the society at home (e.g., Ertanir et al., 2021; Girard et al., 2014, 2016, 2017; Rose et al., 2016). Given the variations in children's (majority) language skills (e.g., Hoff, 2018) or the conditions of language acquisition (e.g., bilingualism, attendance at extrafamilial ECEC), the association between language and socioemotional development might differ between children with different language backgrounds. It should be noted that although some of the studies controlled for language spoken at home (e.g., Rose et al., 2016), this does not indicate whether the association between language and socioemotional development is similar or different between groups. In fact, this has not yet been tested empirically.

To sum up, although a bidirectional association between children's language and socioemotional development has been suggested based on theoretical assumptions, the empirical findings provide a differentiated, partly unclear picture of results. Those results could be related to methodological limitations such as the failure to control for prior levels of children's outcomes (e.g., Paavola-Ruotsalainen et al., 2018; Ziv, 2013), the methodological differences such as operationalization of socioemotional development (e.g., Girard et al., 2017; Petersen et al., 2013), or differences in the sample composition. Hence, while considering children's different language backgrounds, this study examined the association between children's majority language skills and socioemotional development (i.e., positive behavior and socioemotional difficulties) controlling for prior levels of the respective outcomes (at age 3). In addition, this study also tested the generalizability of results by investigating different facets of socioemotional difficulties.

Majority language and socioemotional development among DLLs

With regard to children growing up with different language backgrounds, a sociocultural perspective of development (Rogoff, 2003; Vygotsky, 1978) suggests that children's development is the result of interactions within family and other social contexts, the quality of (language) interactions within these contexts, and the degree of language exposure to and usage of the minority and the majority languages of the resident country. This constitutes a unique experience for language development of DLLs compared to monolinguals. DLLs may have limited majority language skills for daily interactions with (majority language) individuals if they are mainly exposed to minority language(s) (Deanda et al., 2016). In particular, disparities in expressive vocabulary in the majority language have been demonstrated to emerge between monolinguals and DLLs in early childhood, as compared to other language subdomains (Oller et al., 2007). Furthermore, because multilingual children may have less access to the majority language of the society in their families, they may need to draw more heavily on other sources and their socioemotional skills to access them, for example, when interacting with peers or other adults.

As the level of very young DLLs' language skills (either in the majority or minority language) largely depends on the language exposure at home (and at ECEC) as well as on how much children themselves actually speak each

language (Tomasello, 2003), they are unlikely to constitute a homogenous group with regard to their majority language skills (Hoff, 2018; Lauro et al., 2020; Winsler, Burchinal, et al., 2014). For instance, some DLLs with a large exposure to the majority language may have already attained effective communication skills in the majority language, whereas others may still be in the process of acquiring very basic skills in the majority language due to limited input and usage (Hoff, 2018). As the majority language is spoken in a variety of contexts in the resident country, the substantial variation in DLLs' majority language skills might enhance individual differences in their socioemotional development (Winsler, Burchinal, et al., 2014; Winsler, Kim, et al., 2014). This brings up the question of whether the association between majority language and socioemotional outcomes differs between various DLLs groups as compared to monolinguals and whether these differences hold across different socioemotional facets.

To date, little research has been conducted to explore the association between majority language and socioemotional outcomes among DLLs (e.g., Ertanir et al., 2021; Ren et al., 2016; Sun et al., 2021) and those available rarely considered the heterogeneity in DLLs. For instance, drawing on preschoolers aged 36–69 months from 15 English-speaking child care centers, Ren et al. (2016) found that the majority language skills (English) of Mandarin-English DLLs' were positively related to their socioemotional outcomes (i.e., positive behavior and behavioral difficulties) as reported by teachers. However, we do not know the direction of this association, and it remains unknown whether the exposure to each language at home is responsible for this association. A recent study by Ertanir et al. (2021) investigated the association among 33- to 77-month-old DLLs (who speak different minority languages) from 19 preschools in Germany and found an effect of DLLs' teacher-reported socioemotional development (i.e., a compound measure) on their later vocabulary skills but not the reverse. Again, it is unclear whether the extent of exposure to each language at home affects this association. To our knowledge, only one study considered the heterogeneity in language backgrounds while examining the association between these two domains: Winsler, Kim, et al. (2014) found not only a concurrent association between socioemotional outcomes (i.e., positive behavior and behavioral difficulties) of Spanish-English DLLs and the majority language (English) performance at age 4, but also a 1-year-lag effect indicating that DLLs with stronger initial socioemotional development tend to make more progress in English after 1-year attendance at preschool than those DLLs with lower initial socioemotional skills. Furthermore, those DLLs with a higher level of English exhibited higher levels of socioemotional development compared to DLLs with a lower level of English. However, these findings were based on DLLs from low-income families, which might not be generalizable to DLLs with other family backgrounds.

Given the limitations of previous studies and the different patterns of results, a clearer understanding of the role of heterogeneity among DLLs in the relation between their language and socioemotional development is warranted. Hence, this study differentiated DLLs according to the degree of majority language usage at home (i.e., EM-DLLs vs. ML-DLLs), aiming to compare the association between majority language and different facets of socioemotional outcomes among monolingual children and these two DLLs groups.

The impact of family, child care attendance, and child's sex on early language and socioemotional development

Based on the bioecological model, children's development results from the interaction of individuals and their environmental contexts (Bronfenbrenner & Morris, 2006). Apart from the contribution of the quantity of language exposure to and usage to the considerable variability in language acquisition (which in turn potentially affect children's socioemotional outcomes), family background (e.g., parents' education level, family income, and migration background) and child's sex have been well documented to be related to both children's early language and socioemotional development (e.g., De Feyter & Winsler, 2009; Huang, Weinert, von Maurice, et al., 2022; Lauro et al., 2020; Rose et al., 2018; Wirth et al., 2020).

Evidence drawing on samples with different language backgrounds suggests that family background (e.g., parents' educational level, family income) has an indirect effect on children' language and socioemotional outcomes through various home learning environments such as verbally stimulating parenting or disciplinary behaviors (e.g., Harding et al., 2015; Huang, Weinert, von Maurice, et al., 2022; Huang, Weinert, Wareham, et al., 2022). Migration background which is often operationalized by parents' country of origin has been associated with young children's lower majority language skills (e.g., De Feyter & Winsler, 2009; Huang, Weinert, von Maurice, et al., 2022) and less successful socioemotional development (particularly in internalizing outcomes; see Belhadj Kouider et al., 2014, for detailed review). Given the cultural, linguistic, and contextual differences in DLLs and monolinguals, considering aspects of family background as control variables may enhance the robustness of the examined association between children's majority language and socioemotional development (De Feyter & Winsler, 2009; Winsler, Burchinal, et al., 2014).

In addition to the family contexts, attending any ECEC outside the family (e.g., center-based child care) provides children with an additional opportunity to interact with peers and caregivers other than the parents.

For DLLs particularly, attendance at ECEC might represent an opportunity to be exposed to and to use the majority language, as well as to establish interactions with peers speaking the majority language (Erdemir & Brutt-Griffler, 2022). Furthermore, numerous studies have demonstrated a positive relation between early attendance at ECEC and more advanced majority language skills—with the strongest relation for DLLs from families with low exposure to the majority language (Kohl et al., 2019). For our sample, not all children attended ECEC at a young age before compulsory schooling (at age 5). This makes it important to control for children's early attendance at ECEC. Finally, studies regarding child's sex have found that girls possess overall more advanced language skills and are more likely to exhibit more prosocial behavior than boys in early childhood (Girard et al., 2017; Rose et al., 2018; Wirth et al., 2020).

The present study

The primary goal of this study was to advance the understanding of the association between children's language and socioemotional development in early childhood by considering children's language backgrounds and controlling for prior respective outcomes at age 3. Focusing on early childhood is particularly important as it is a crucial period for later developments and in which (problematic) developmental pathways are amenable to change (Shonkoff & Phillips, 2000). Furthermore, while we focused on differences in children's prosocial behavior and their overall socioemotional difficulties, we additionally tested for the generalizability of results by differentiating various facets of socioemotional difficulties, that is, conduct problems and hyperactivity (as externalizing), emotional symptoms (as internalizing), and peer relationship problems. In addition, we included one model using the full sample to test for the comparability of results with previous relevant studies that did not differentiate various language backgrounds. Models also controlled for family and ECEC contexts and child's sex.

Drawing on a nationally representative sample from the UK, we explored one main research question: Does the association between children's majority language and socioemotional development differ between children with different language backgrounds? Due to the variation of majority language skills among monolinguals and DLLs (Hoff, 2018; Lauro et al., 2020; Winsler, Burchinal, et al., 2014), we posited to find different associations between early majority language and socioemotional development across groups.

Since the majority of empirical results show a correlation between children's early language and their later socioemotional development (either positive behavior or socioemotional difficulties; e.g., Girard et al., 2016, 2017; Petersen et al., 2013; Rose et al., 2016), we expected to find at least an effect of children's language skills on socioemotional outcomes (i.e., prosocial behavior and overall socioemotional difficulties) for monolinguals (i.e., MOEN). Although previous studies documented mixed findings on the opposite effect (depending on the indicator of socioemotional development), we suspected that the opposite effect might only show up for the overall socioemotional difficulties in MOEN.

Due to the scarcity of findings related to the association between majority language skills and socioemotional development in DLLs, we aimed to conduct an exploratory examination (without specifying hypothesis) of these relations among children who spoke both English and minority language(s) at home (i.e., EM-DLLs). However, because children who spoke exclusively minority language(s) at home (i.e., ML-DLLs) may possess very limited majority language skills, we hypothesized that their majority language might not be related to their socioemotional outcomes (which may largely depend on their minority language). On the other hand, these children may need to draw on their socioemotional skills to access the majority language and to improve it. Thus, we expected to find the effects of socioemotional development on the majority language skills for ML-DLLs.

METHOD

Participants

The Millennium Cohort Study

The Millennium Cohort Study (MCS) is an ongoing observational, multidisciplinary cohort study that began in 2000–2001. The MCS includes a representative sample of 18,552 families from across the UK in the first wave, including 253 sets of twins and 11 sets of triplets. In Wave 2, 692 additional families participated in the study; however, these new families were excluded from our analyses because the information on ECEC attendance at 9 months was missing. Twins and triplets were not included in the analyses, because of the known anomalous language outcomes among multiple-birth children (McMahon et al., 1998). Applying sample design weights permits inference to the general UK population (see Plewis et al., 2007, for details of sampling design).

The MCS collects a diverse range of data on children, their siblings, and parents via both direct interviews and self-completion questionnaires (Hansen et al., 2010). There have been eight waves to date (from 9 months to 22 years). In Waves 1 and 2, parents provided information on family demographics and child's characteristics. Given that this study aimed to focus on early childhood, we only used data from the first three waves, that is,

when children were 9 months (M = 9.20, SD = 0.51), 3 years (M = 37.62, SD = 2.46), and 5 years (M = 62.63, SD = 2.97) where information on children's language and socioemotional outcomes is available. The analyses were based on information from 12,951 children who continuously participated in the study till the third-panel wave and had information on both outcomes at age 5 (49% female). For further information on attrition, see Table S1. In Wave 2, around 39% of the parents had a low educational level, 17% had a middle educational level, and 44% had a high educational level (details see below). The monthly family net equivalent income in Wave 2 averaged 1449.63 pounds (SD = 956.12). Around 21% of the parents were born outside the UK. The ethnic groups of children in this study were White (85%), Pakistani and Bangladeshi (6%), Black or Black British (3%), Mix (3%), and Indian (2%). The current study only conducted secondary data analysis and thus there was no need for Institutional Review Board approval.

Measures

Language background

At age 3, parents reported whether English was the language usually spoken at home, and if the usual household language was not only English. Parents further indicated who in the household spoke other language(s) (i.e., mother, father, cohort child, or other household members). We considered children who spoke not only English at home as DLLs. In particular, we identified those children who only spoke English at home as monolingual English children (*MOEN*; n = 11,410; 88%), those who spoke both English and minority language(s) at home as *EM-DLLs* (n = 1181; 9%), and those who spoke only minority language(s) at home as *ML-DLLs* (n = 360; 3%). In relation to the minority languages, most of them were Urdu (20%), Punjabi (16%), Welsh (12%), and Bengali (11%).

Majority language skills

Children's expressive vocabulary was assessed by the Naming Vocabulary subtest from the British Ability Scales Second Edition (Elliott et al., 1996), when they were about 3 and 5 years of age. The test comprises a stimulus booklet presenting a total of 36 colorful pictures that the child is asked to name (e.g., picture of a shoe). Starting and stopping points differ depending on the child's age and performance: The better they do, the more items they are given. The test is stopped at any point when the child has made five consecutive errors. The standardized ability scores (adjusted for item difficulty) were used as continuous variables indicating children's (majority) language skills.

Socioemotional development

Measures on children's socioemotional strengths and difficulties were based on the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) containing five subscales: Prosocial Behavior (e.g., "shares readily with other children"; "often volunteers to help others"), Conduct Problems (e.g., "often fights with other children or bullies them"; "often has temper tantrums or hot tempers"), Hyperactivity (e.g., "thinks things out before reacting"; "easily distracted, concentration wanders"), Emotional Symptoms (e.g., "many worries, often seems worried"; "nervous or clingy in new situations"), and Peer Relationship Problems (e.g., "rather solitary, tends to play alone"; "picked on or bullied by other children"). At ages 3 and 5, parents rated their children's behavior on these five subscales (5-items each) using 3-point scales ranging from 0 (*not true*) to 2 (*certainly true*). For the main analyses, we used the separate Prosocial Behavior subscale to indicate children's strengths. A higher rating in Prosocial Behavior (sum score ranging between 0 and 10) indicates more engagement in prosocial behavior (age 3: α = .66, ω = .66; age 5: α = .67, ω = .68). We also included a Total Difficulties score which was generated as the sum of the latter four subscales (ranging between 0 and 40; age 3: α = .78, ω = .77; age 5: α = .80, ω = .78). A higher rating in Total Difficulties reflects increased behavioral or emotional difficulties (see Goodman, 1999, for details). To test for the generalizability of results (as well as the comparability with other studies), we also analyzed the association using separate (socioemotional) difficulties subscales, that is, Conduct Problems and Hyperactivity (as externalizing), Emotional Symptoms (as internalizing), and Peer Relationship Problems. To check whether the SDQ scales measure equivalent constructs across the three language groups (as DLLs' parents may differ in their English proficiency), measurement invariance has been tested beforehand. We found that SDQ had configural, metric, and scalar invariance across the three language groups (ΔCFIs ≤ .01; Cheung & Rensvold, 2002; see Table S2 for details), suggesting that the SDQ scales can be validly compared across groups.

Family background

Parental education

The parent-reported education according to the UK education system (from Wave 2) was recoded into the Comparative Analysis of Social Mobility in Industrial Nations-Classification (CASMIN-Classification; Brauns et al., 2003). The CASMIN-Classification consists of nine educational categories tracking both academic and vocationally oriented education. It allows for the representation of institutional differences in national education and training systems. Due to low numbers in certain

categories, the CASMIN indicators were condensed into three broad groups: low, middle, and high (see Table S3 for details). Thus, we treated parental education as a categorical variable. Two dummy variables were used in the analysis models: low education level and middle education level (reference category: high education level).

Family net equivalent income

Parents' net income from Wave 2 was included in this study. Family monthly net equivalent income was transferred through the available weekly family net equivalent income and used in this study. Further, we log-transformed the net equivalent income to reduce its skewness.

Parents' migration background

In Wave 2, when children were 3 years old, parents provided information on whether they were born in the UK or abroad. Within the sample we used in this study, there were 2724 parents (either of them or both) born outside the UK (coded as 1) and 9995 were born in the UK (coded as 0).

Attendance at ECEC under 36 months

At 9 and 38 months, the responding parent reported how long (in months) the target child had attended ECEC (i.e., care by childminder or day nursery) previously. For this study, attendance at ECEC under 36 months was used as a continuous variable.

Child's sex

At 9 months, parents reported their child's sex (boy = 0; girl = 1).

Analysis strategy

Autoregressive cross-lagged models were evaluated by using structural equation modeling in M*plus* 8.3 (Muthén & Muthén, 2017). The following cutoff criteria for fit indexes have been used in this study: comparative fit index (CFI) > .95, standardized root mean squared residual (SRMR) < .08, and root mean squared error of approximation (RMSEA) < .08 (Hu & Bentler, 1999).

We first compared an unconstrained multigroup model (Model A) with all path coefficients freely estimated to four constrained multigroup models (Models B, C, D, and E) with all path coefficients differentially constrained across groups. In Model A, all paths were free to differ between groups; in Model B, all paths were constrained to be equal for MOEN, EM-DLLs, and ML-DLLs. In Model C, all paths were constrained to be equal for MOEN and EM-DLLs; in Model D, all paths were constrained to be equal for MOEN and ML-DLLs; in Model E, all paths were constrained to be equal for EM-DLLs and ML-DLLs. Chi-square difference tests were used to compare these five models.

In the main analyses, we ran the unconditional and conditional multigroup models. In the latter model, family background (i.e., low and middle educational level, family net equivalent income, and migration background), attendance at ECEC under 36 months, and child's sex were entered as predictors of children's language and socioemotional outcomes at both assessment time points. Finally, we ran two additional conditional models for sensitivity checks using (1) separate difficulties subscales and (2) the full sample.

There were 0.1%–6% missing for each studied variable (Table 1). Children with lower-educated parents were more likely than those with higher-educated parents to have missing data in prosocial behavior ($F(2, 12{,}819) = 127.00$, $p < .001$), total difficulties ($F(2, 12{,}819) = 127.40$, $p < .001$), and language skills ($F(2, 12{,}819) = 43.91$, $p < .001$). Children with immigrant parents were more likely than children with parents without migration background to have missing data in prosocial behavior ($F(1, 12{,}717) = 965.12$, $p < .001$), total difficulties ($F(1, 12{,}717) = 973.14$, $p < .001$), and language skills ($F(1, 12{,}717) = 308.18$, $p < .001$). Boys were more likely than girls to have missing data in language skills ($F(1, 13{,}029) = 13.59$, $p < .001$). In the analyses, we used the full information maximum likelihood (FIML) to handle missing data. FIML has been demonstrated to be superior to traditional methods addressing missing data (Enders & Bandalos, 2001) or as yielding equivalent results compared to multiple imputation (Graham, 2003). In addition, all analyses also included survey weights to correct for unequal probabilities of selection (resulting from the stratified cluster sample design) and attrition bias due to non-response across the survey waves.

RESULTS

Descriptive statistics

Tables 1 and 2 present descriptive statistics on all study variables for the full sample and separately for MOEN, EM-DLLs, and ML-DLLs. One-way ANOVAs indicated that there were statistically significant differences between groups in children's prosocial behavior (age 3: $F(2, 12{,}508) = 3.17$, $p < .05$; age 5: $F(2, 12{,}633) = 8.02$, $p < .001$), total difficulties (age 3: $F(2, 12{,}512) = 768.90$, $p < .001$; age 5: $F(2, 12{,}636) = 464.04$, $p < .05$), and expressive vocabulary (age 3: $F(2, 12{,}220) = 1025.55$, $p < .001$; age 5: $F(2, 12{,}790) = 916.12$, $p < .001$) at ages 3 and 5. Tukey post hoc tests revealed that children's prosocial behavior was significantly lower in ML-DLLs compared to MOEN at ages 3 and 5, and lower in EM-DLLs compared to MOEN at age 5 ($ps < .05$). However, there were no

TABLE 1 Descriptive statistics of study variables for the full sample (N = 12,951).

Variable	*M* (SD)	Range	Min	Max	Missingness, %
Age 3					
Prosocial behavior (sum)	7.09 (2.04)	0–10	0	10	4
Total difficulties score (sum)	9.14 (4.97)	0–40	0	30	4
Expressive vocabulary (ability score)	73.80 (17.67)	10–141	10	141	6
Age 5					
Prosocial behavior (sum)	8.31 (1.74)	0–10	0	10	3
Total difficulties score (sum)	7.07 (4.78)	0–40	0	34	3
Expressive vocabulary (ability score)	107.89 (16.24)	10–170	10	170	1
Control variables					
Parental education level[a] (age 3)	2.06 (0.91)	1–3	1	3	2
Family net equivalent income (£; age 3)	1449.63 (956.12)	50.92–5902.78	50.92	5902.78	1
Parents' immigrant background (yes = 1)	0.21 (0.41)	0–1	0	1	2
Child's sex (girl = 1; 9 months)	0.49 (0.50)	0–1	0	1	—
Attendance at ECEC under 36 months (months)	3.37 (7.67)	0–36	0	36	0.1

Abbreviations: DLLs, dual language learners; ECEC, early child education and care under 36 months.

[a]1 = low, 2 = middle, 3 = high.

significant differences in prosocial behavior between the MOEN and EM-DLLs, EM-DLLs and ML-DLLs at age 3, or EM-DLLs and ML-DLLs at age 5. At ages 3 and 5, children's total difficulties were significantly higher in ML-DLLs and EM-DLLs compared to MOEN ($ps < .001$); the differences between ML-DLLs and EM-DLLs were nonsignificant. Regarding children's expressive vocabulary in the majority language, it was significantly lower in ML-DLLs and EM-DLLs compared to MOEN, as well as lower in ML-DLLs compared to EM-DLLs at ages 3 and 5 ($ps < .001$). Overall, a significant increase of prosocial behavior (MOEN: $t(11{,}204) = 66.97$, $p < .001$; EM-DLLs: $t(920) = 14.17$, $p < .001$; ML-DLLs: $t(186) = 7.67$, $p < .001$) and a decrease of total difficulties (MOEN: $t(11{,}207) = -50.46$, $p < .001$; EM-DLLs: $t(920) = -15.33$, $p < .001$; ML-DLLs: $t(186) = -5.77$, $p < .001$) were observed for each of the groups across the 2 years.

Turning next to the correlational analyses, the results are presented separately for the full sample, MOEN, EM-DLLs, and ML-DLLs in Tables S4 and S5. Unless noted otherwise, the significance level was set at $p < .001$ for all significant effects. Overall, individual skill differences proved to show some stability across time points, that is, children showing comparatively more prosocial behavior, more total difficulties, and more advanced expressive vocabulary in the majority language at age 3 tended to show higher levels of respective outcomes at age 5 (MOEN: $rs = .47$, .61, and .46; EM-DLLs: $rs = .34$, .56, and .59; ML-DLLs: $rs = .25$, .48, and .57; full sample: $rs = .45$, .60, and .54 for prosocial behavior, total difficulties, and expressive vocabulary, respectively). For both MOEN and EM-DLLs, children with advanced expressive vocabulary at age 3 tended to exhibit more prosocial behavior and to have less total difficulties 2 years later (MOEN: $rs = .12$ and $-.22$; EM-DLLs: $rs = .20$ and $-.20$), and vice versa (MOEN: $rs = .09$ and $-.18$; EM-DLLs: $rs = .13$ and $-.21$). For ML-DLLs, those who had advanced expressive vocabulary in English at age 3 tended to have less total difficulties at age 5 ($r = -.14$, $p < .05$), and those who exhibited more prosocial behavior or less total difficulties at age 3 tended to have advanced English expressive vocabulary at age 5 ($r = .16$, $p < .05$ and $r = -.26$). Note that the rather low stabilities also hint to important changes of individual differences between ages 3 and 5.

Autoregressive cross-lagged models

The results for model comparison indicated that the unconstrained Model A had better fit than the fully constrained Model B, $\Delta\chi^2(124) = 419.058$, $p < .001$, CFI = .991, RMSEA = .075, 90% CI [.06, .08], SRMR = .013, or the partially constrained Models C, D, and E, $\Delta\chi^2(62) = 189.339$, $p < .001$; $\Delta\chi^2(62) = 233.985$, $p < .001$; $\Delta\chi^2(62) = 112.511$, $p < .001$, suggesting that there are significant differences in those relations across groups.

Regarding results of the main analyses (drawing on the unconstrained model), the model fit indices indicated that the unconditional and conditional models fit the data well ($\chi^2 = 151.601$, df = 6, $p < .001$, CFI = .983, RMSEA = .075, 90% CI [.07, .09], SRMR = .028; $\chi^2 = 144.029$, df = 6, $p < .001$, CFI = .990, RMSEA = .073, 90% CI [.06, .08], SRMR = .014). The results from the conditional and unconditional models were similar. Only two effects in the unconditional model, that is, from prosocial behavior at age 3 to expressive vocabulary at age 5 for monolinguals and from expressive vocabulary at age

TABLE 2 Descriptive statistics of study variables separately for children with different language backgrounds.

					DLLs							
	Monolingual English children (n_{MOEN} = 11,410)				English and minority language (n_{EM_DLLs} = 1181)				Minority language predominant ($n_{ML\text{-}DLLs}$ = 360)			
Variable	*M* (SD)	Range	Min	Max	*M* (SD)	Range	Min	Max	*M* (SD)	Range	Min	Max
Age 3												
Prosocial behavior (sum)	7.10 (2.02)	0–10	0	10	7.10 (2.23)	0–10	0	10	6.75 (2.28)	0–10	0	10
Total difficulties score (sum)	9.02 (4.91)	0–40	0	30	10.14 (5.34)	0–40	0	29	10.46 (5.50)	0–40	0	30
Expressive vocabulary (ability score)	76.00 (15.87)	10–141	10	141	56.73 (20.18)	10–141	10	141	47.98 (22.03)	10–141	10	112
Age 5												
Prosocial behavior (sum)	8.33 (1.72)	0–10	0	10	8.16 (1.86)	0–10	0	10	8.03 (2.01)	0–10	0	10
Total difficulties score (sum)	6.98 (4.74)	0–40	0	34	7.70 (4.95)	0–40	0	29	8.30 (5.18)	0–40	0	27
Expressive vocabulary (ability score)	109.96 (14.75)	10–170	10	170	94.33 (17.86)	10–170	10	170	87.27 (19.50)	10–170	10	131
Control variables												
Parental education level[a] (age 3)	2.09 (0.91)	1–3	1	3	1.91 (0.93)	1–3	1	3	1.68 (0.90)	1–3	1	3
Family net equivalent income (£; age 3)	1503.96 (959.53)	50.92–5902.78	50.92	5902.78	1098.17 (866.32)	50.92–5902.78	62.36	5437.73	880.85 (651.47)	50.92–5902.78	72.11	5156.19
Parents' immigrant background (yes = 1)	0.12 (0.33)	0–1	0	1	0.86 (0.34)	0–1	0	1	0.94 (0.24)	0–1	0	1
Child's sex (girl = 1; 9 months)	0.49 (0.50)	0–1	0	1	0.50 (0.50)	0–1	0	1	0.49 (0.50)	0–1	0	1
Attendance at ECEC under 36 months (month)	3.53 (7.80)	0–36	0	36	2.53 (6.99)	0–36	0	36	1.58 (5.47)	0–36	0	34

Abbreviations: DLLs, dual language learners; ECEC, early child education and care under 36 months; MOEN, English monolingual children.

[a]1 = low, 2 = middle, 3 = high.

3 to total difficulties at age 5 for EM-DLLs, were no longer significant in the conditional model. All other effects remained significant with highly similar coefficients in the conditional model. Thus, we only report the results from the conditional model. For detailed results of the unconditional model see Figure S1.

Figure 1 displays the results separately for MOEN, EM-DLLs, and ML-DLLs. The autoregressive pathways were significant for all groups, which indicates that children who showed comparatively more prosocial behavior, less total difficulties, or had advanced expressive vocabulary (in majority language) at age 3 tended to do so at age 5. There were comparable concurrent associations for MOEN and EM-DLLs—that is, children with comparatively higher levels of expressive English vocabulary exhibited more prosocial behavior and less total difficulties at both time points. For ML-DLLs, the significant concurrent associations only emerged within socioemotional domains, that is, children who exhibited more prosocial behavior tended to show less total difficulties at ages 3 and 5.

The cross-lagged effects differed between groups. For MOEN, children with advanced expressive vocabulary at age 3 tended to show greater positive developments (changes of individual differences in socioemotional outcomes), that is, showed more developmental progress in prosocial behavior and lower total difficulties at age 5. Children who exhibited lower total difficulties at age 3 tended to have greater progress in their expressive vocabulary, namely possessed higher levels of expressive vocabulary in the majority language at age 5. For DLLs groups, results indicated opposite unidirectional associations between these two domains, that is, EM-DLLs' expressive vocabulary at age 3 predicted development (i.e., positive changes in individual differences) in their prosocial behavior, ML-DLLs' (lower) difficulties at age 3 predicted development in their expressive vocabulary in the majority language. When comparing the effect sizes across groups, we found comparable effect sizes for MOEN and EM-DLLs regardless of the significance levels of the estimates, that is, the effect of earlier total difficulties on the changes of interindividual differences in expressive vocabulary ($\beta_{MOEN}=-.04$, $p<.01$ vs. $\beta_{EM\text{-}DLLs}=-.03$, $p=.47$: $\Delta\chi^2(1)=0.198$, $p=.656$) and the opposite effect of earlier expressive vocabulary on the changes of interindividual differences in total difficulties ($\beta_{MOEN}=-.07$, $p<.01$ vs. $\beta_{EM\text{-}DLLs}=-.07$, $p=.47$: $\Delta\chi^2(1)=0.113$, $p=.736$). On the other hand, the effect sizes for ML-DLLs significantly differed from those for MOEN and EM-DLLs, e.g., the effect of earlier total difficulties on later expressive vocabulary ($\beta_{ML\text{-}DLLs}=-.17$, $p<.05$ vs. $\beta_{MOEN}=-.04$, $p<.01$: $\Delta\chi^2(1)=8.544$, $p<.01$; and vs. $\beta_{EM\text{-}DLLs}=-.03$, $p=.47$: $\Delta\chi^2(1)=7.535$, $p<.01$). For detailed results of cross-lagged effects and covariates, see Tables S6 and S7.

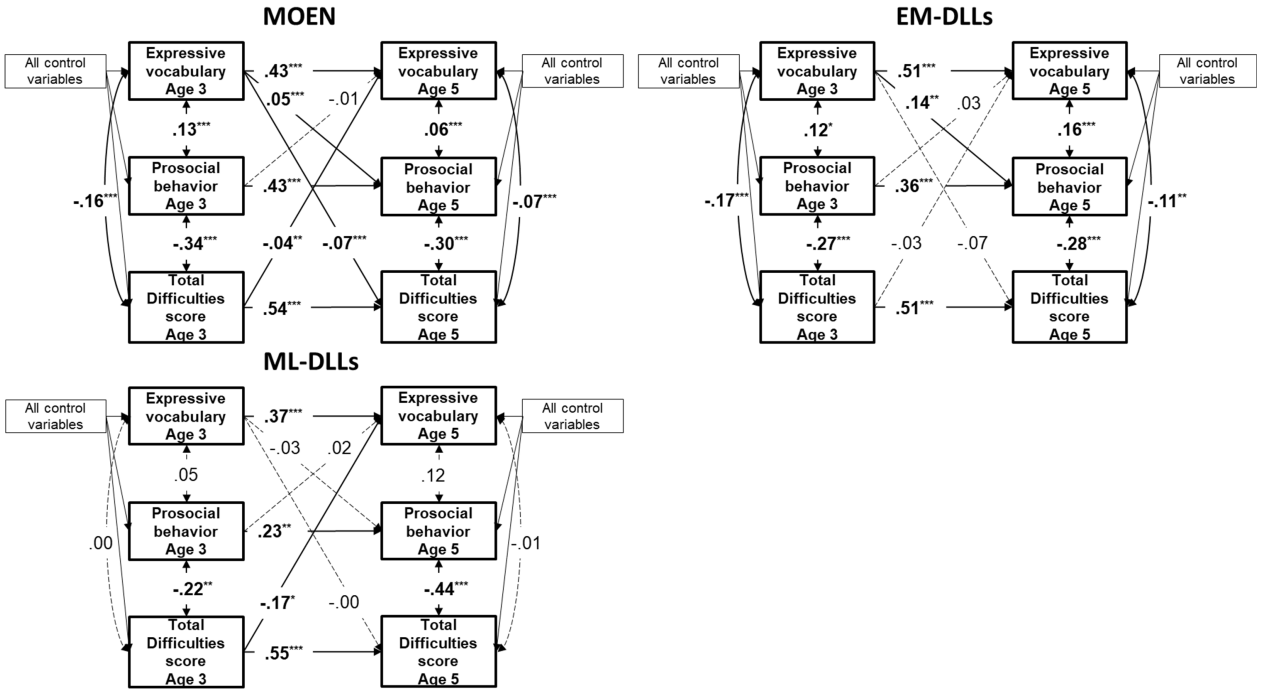

FIGURE 1 Standardized estimates of the conditional bidirectional coupling model. Significant coefficients are presented in bold on solid lines. Nonsignificant coefficients are presented on dashed lines. $n_{MOEN}=11{,}410$, $n_{EM\_DLLs}=1181$, $n_{ML\text{-}DLLs}=360$, $\chi^2=144.029$, df = 6, $p<.001$, comparative fit index = .990, root mean squared error of approximation = .073, 90% CI [.06, .08], standardized root mean squared residual = .014. EM-DLLs, English and minority languages dual language learners; ML-DLLs, minority language predominant dual language learners; MOEN, English monolingual children. *$p<.05$. **$p<.01$. ***$p<.001$.

Sensitivity checks

The first sensitivity check considered the different facets of socioemotional difficulties separately. Differentiating between children with different language backgrounds, the conditional models indicated that results on externalizing (conduct problems, hyperactivity) and internalizing (emotional symptoms) problems were highly similar to those on the total difficulties score, that is, bidirectional effects for MOEN, no significant cross-lagged association for EM-DLLs, and a unidirectional effect of total difficulties on expressive vocabulary for ML-DLLs (except for conduct problems). However, peer relationship problems revealed different results—that is, a unidirectional effect of expressive vocabulary on peer relationship problems for MOEN, a unidirectional effect of peer relationship problems on expressive vocabulary for EM-DLLs, and nonsignificant cross-lagged association for ML-DLLs. For detailed results, see Figure S2.

The second sensitivity check considered the full sample to test for the comparability with previous findings that did not differentiate language backgrounds. Again, the model fitted the data well ($\chi^2 = 140.709$, df = 2, $p < .001$, CFI = .990, RMSEA = .073, 90% CI [.06, .08], SRMR = .014). The results were very similar to those for MOEN (in terms of significance level and coefficients). All the autoregressive and concurrent associations were significant. Cross-lagged pathways showed that advanced early expressive English vocabulary was associated with better socioemotional development (more prosocial behavior, lower total difficulties); lower total difficulties were associated with later advanced expressive English vocabulary. For detailed results, see Figure S3.

DISCUSSION

The current study aimed to examine the directionality of the association between children's early majority language and socioemotional development by using a British representative sample. Given the language-related heterogeneity among children, we explored whether this association differed between monolingual children and two different DLLs groups controlling for children's prior outcomes at age 3. Primarily, our findings substantiate the assumption that the association between these two domains differs between children with different language backgrounds—that is, we found a bidirectional association between majority language and socioemotional outcomes for MOEN; a unidirectional effect of majority language skills on prosocial behavior for EM-DLLs, and a unidirectional effect of total socioemotional difficulties on majority language skills for ML-DLLs. Highly similar results from the unconditional and conditional models indicate that these associations are robust to the inclusion of control variables: Parental education, family net equivalent income, migration background, attendance at ECEC under 36 months, and child's sex. Second, the results indicate that this overall pattern of relations largely holds for externalizing (conduct problems, hyperactivity) and internalizing (emotional symptoms) child behavior though not for peer relationship problems. In the latter case, we found a unidirectional effect of expressive vocabulary on (less) peer relationship problems for MOEN, the opposite effect for EM-DLLs, and nonsignificant cross-lagged association for ML-DLLs. Finally, considering the full sample, our results replicate prior studies by supporting the assumption that children's majority language skills are positively related to socioemotional outcomes and socioemotional difficulties are associated with (lower) language outcomes.

Association for the full sample

Our findings based on the full sample are in line with previous findings which indicated a bidirectional association between children's language skills and socioemotional difficulties (Girard et al., 2014, 2016; Petersen et al., 2013) and a unidirectional effect of language skills on prosocial behavior (Girard et al., 2017). It is noteworthy that the studies of Girard et al. (2014) and Petersen et al. (2013) drew on Canadian and U.S. samples which particularly underlines the replicability of findings across countries. These findings align with the theoretical assumption that advanced language skills facilitate social interaction in daily life by better understanding others, expressing themselves more efficiently, solving conflicts verbally, and triggering more prosocial behavior (Bruner, 1983; Durkin & Conti-Ramsden, 2007; Keenan & Shaw, 2003; Schultz et al., 2001). Furthermore, advanced language skills may contribute to self-regulation, which in turn, could also reduce the formation of socioemotional difficulties. At the same time, children who exhibit less socioemotional difficulties seem to be more likely to boost their language exposure and production by increased social interactions (Bruner, 1985; Tomasello, 1992). However, our findings partially differ from those of Rose et al. (2016) who reported a unidirectional effect of children's language skills on the various facets of socioemotional development. This inconsistency might be due to different measures of children's language and socioemotional outcomes. While Rose et al. (2016) combined children's vocabulary and grammar (i.e., sentence comprehension) to indicate language skills and measured different socioemotional facets (i.e., cooperation, aggression, and self-regulation) across 4 years, our study only examined children's vocabulary and considered prosocial behavior and socioemotional difficulties across 2 years. It could

be that the socioemotional facets studied by Rose et al. (2016) may not be relevant for a combined measure of language skills or for within-person changes across a broader age span. Together with our findings (i.e., significant effect of socioemotional difficulties, but not prosocial behavior, on children's vocabulary), it suggests that not all socioemotional facets are relevant to all aspects of language acquisition. Future studies investigating the association between different facets of children's language and socioemotional outcomes might shed further light on these partially inconsistent findings.

Association by different language backgrounds

Our study advances prior analyses by Girard et al. (2017)—who examined the association between children's expressive vocabulary and prosocial behavior using the same sample as the current study—by differentiating children with different language backgrounds and additionally considering overall socioemotional difficulties. Furthermore, we also extend findings from prior works (Ren et al., 2016; Winsler, Kim, et al., 2014)—which investigated this relation among DLLs—by demonstrating differences in the directionality of this relation among different DLLs groups. The results for MOEN are highly similar to those for the full sample, whereas those for DLLs are different. This indicates that previous findings that did not differentiate between children's language backgrounds cannot simply apply to children who acquire minority language(s) in addition to the majority language (Barnett et al., 2012; Girard et al., 2017; Rose et al., 2016).

It is noteworthy that although the bidirectional effect of the cross-lagged association between expressive vocabulary and total difficulties is significant for MOEN, their effect sizes are not significantly different from those nonsignificant effects (of the same paths) for EM-DLLs—a smaller group (n = 1181). Although the small effect sizes that only become significant for MOEN—a rather large sample (e.g., $\beta = -.04$, $p < .01$; $n = 11{,}410$), it does not mean that these significant effects are meaningless. Both theoretical accounts and empirical findings could provide support for a bidirectional association between these two domains (even when controlling for autoregressive effects). For example, one previous study also found that monolingual children's language ability predicts individual variability in the development of behavioral difficulties over and above a series of influential factors and prior levels of behavioral difficulties, and vice versa (Petersen et al., 2013). Furthermore, the (significantly) different effect sizes between the smallest group (i.e., ML-DLLs, $n = 360$) and the other two groups indicate that we are still able to detect different effect sizes across groups regardless of the different sample sizes. In particular, the different effect sizes between two DLLs groups suggest that DLLs are not a homogenous group. Differentiating them according to their language status is necessary when investigating the association between their language and socioemotional development.

With regard to the DLLs groups, the unidirectional association for EM-DLLs (from early language to later prosocial behavior) indicates that the majority language skills make an essential contribution to the development of prosocial behavior for DLLs who have at least basic communication skills in the majority language. On the other hand, the nonsignificant effect of early majority language skills on later socioemotional outcomes for ML-DLLs points out that DLLs who are not exposed to the majority language of the society at home might have limited opportunities to acquire the majority language (Hoff, 2018; Lauro et al., 2020), which in turn is less likely to affect their socioemotional outcomes. For these children, their minority language skills might be of central importance (see below). However, ML-DLLs' socioemotional development was shown to facilitate majority language development probably by increasing opportunities to access and produce the majority language. It could be that DLLs use their minority language to establish social interactions with peers who also speak the same minority language, which in turn, increases the opportunity to promote socioemotional development. In this regard, we additionally ran two models drawing on monolinguals with difficulties in expressive vocabulary at age 3 (based on parent-reported difficulties and a score −1.5 SDs on vocabulary test, respectively). Similar to ML-DLLs, we found a nonsignificant association between early language and later socioemotional outcomes (which might be due to the reduced variance). Yet, contrary to ML-DLLs, we did not find a significant association between early socioemotional outcomes and later language skills. This result may suggest that monolinguals who can only draw on their (limited) majority language skills do not develop sufficient socioemotional skills to enhance opportunities to develop their language, whereas ML-DLLs can draw on their minority language to foster their socioemotional development, which in turn, helps increase access to the majority language. Note that although the nonsignificant association for monolinguals with a score −1.5 SD on the vocabulary test might be due to range restriction of monolinguals' vocabulary score (i.e., 10–44), monolinguals who had difficulties in vocabulary according to their parents had a comparable range of the test score as compared to ML-DLLs (i.e., 10–118 vs. 10–112). For detailed results, see Tables S8 and S9; Figures S4 and S5.

In addition, the different findings for peer relationship problems compared to externalizing and internalizing behaviors suggest that the former reflects more

mutual (peer) interactive behaviors which might largely depend on children's language skills, whereas the latter relates to children's own behaviors. EM-DLLs could form friendships using both majority and minority languages, whereas ML-DLLs might be rejected by monolingual children due to lower levels of majority language skills (Menting et al., 2011), but could still have good relationships with peers who speak the same minority language(s). However, the extent to which DLLs' majority and minority languages differentially or interactively affect their peer relationships seems to be very complicated and cannot be sufficiently addressed in this study (due to data availability). Future studies investigating this question are warranted.

Moreover, our findings on DLLs partially differ from the findings of Ertanir et al. (2021) who reported only a unidirectional effect of DLLs' socioemotional skills on their later majority language skills. In particular, for EM-DLLs, we did not find a significant effect of any socioemotional facets on majority language skills. The reasons for this discrepancy might be twofold. First, the differences in the measures of socioemotional development might contribute to the contrasting findings. In our study, socioemotional development was reported by parents, whereas Ertanir et al. (2021) used teacher-reported socioemotional outcomes. Because teachers and parents might have different frames of reference to assess children's behavior, teacher-reported and parent-reported socioemotional outcomes might differ (e.g., Kohl et al., 2020; Lewis et al., 2015). Furthermore, children's behavior might also be context-dependent. In addition, while socioemotional outcomes in our study were indicated by prosocial behavior and socioemotional difficulties, Ertanir et al. (2021) aggregated six socioemotional subscales (i.e., cooperation, integration in the group, playing behavior, prosocial behavior, peer relationship problems, and emotion regulation) which might enhance the variance of this variable. Furthermore, as the aggregated indicator conflates dimensions, it does not provide a lot of clarity on which aspect(s) of socioemotional development is exactly associated with children's language skills. Second, while Ertanir et al. (2021) drew on a preschool DLLs sample, our DLLs sample included 1362 children (among 1621 DLLs) who had not been to ECEC at all under 36 months. Children who attended ECEC may have had more chances to acquire the majority language by having more social interactions with native speakers (peers and caregivers). In order to address this issue, we ran an additional robustness check which only included children who attended ECEC before 36 months ($n = 259$). However, the model showed an unacceptable model fit ($\chi^2 = 34.164$, df = 2, $p = .312$, CFI = .894, RMSEA = .252, 90% CI [.18, .33], SRMR = .040), that we could not interpret the results (see Table S10; Figure S6).

The role of DLLs' minority language in their socioemotional development

Comparing the results for ML-DLLs and monolinguals with low vocabulary skills indirectly reflects that DLLs' minority language might also contribute to their socioemotional development. On the one hand, DLLs could develop self-regulating ability through social interactions using their minority language, which in turn, could facilitate DLLs' socioemotional development (Salmon et al., 2016; Vygotsky, 1962). For example, one recent study illustrated that DLLs with the most limited vocabulary in the majority language (English) have better teacher-reported socioemotional skills as compared to monolinguals with poor majority language skills (McNally et al., 2019). Another study that directly investigated the impact of minority language (Spanish) found that DLLs who made greater progress in the majority language after 1-year attendance at preschool had higher initial levels of socioemotional outcomes compared to monolinguals (Winsler, Kim, et al., 2014). On the other hand, having (better) minority language skills might not always support DLLs' socioemotional development. If these children have limited majority language skills (due to the lack of exposure to and usage of majority language), this might increase the likelihood of peer rejection in peer groups mainly using the majority language (e.g., Menting et al., 2011). This would reduce the possibility to promote socioemotional development in this group. For example, Ren et al. (2016) investigated the impacts of majority (English) and minority (Mandarin) languages on DLLs' social competence and found that DLLs with better minority language tend to have higher levels of internalizing problems. The authors also speculated that DLLs who predominantly speak a minority language may not be well accepted or even be rejected by peers who speak the majority language.

Moreover, the different findings for EM-DLLs and ML-DLLs might also reflect the important role of the minority language in their socioemotional development. One reason for this might be that EM-DLLs could use minority as well as majority languages to establish social interactions and develop self-regulating skills, whereas ML-DLLs could exclusively use their minority language to interact with peers who speak the same minority language and enhance their self-regulating skills. The variations in minority language skills, self-regulating skills, and the frequency of social interactions might simultaneously contribute to differences in DLLs' socioemotional development. However, our study cannot determine to what extent DLLs' minority language skills are responsible for their socioemotional development. Borrowing previous empirical findings, it is also unclear, which pathway—support through self-regulating ability or impediment through peer rejection—could better explain the role of DLLs'

minority language in their socioemotional development. As we noted, studies investigating the impact of minority language on children' socioemotional development are still limited, more studies are needed before drawing a conclusion.

Strengths and limitations

The major strength of this study is the longitudinal design and use of a nationally representative sample to gain a better understanding of the association between young children's majority language and socioemotional development by controlling for children's prior outcomes. Our study extends (limited) prior work by investigating this association separately for monolinguals and two different DLLs groups. Furthermore, differentiating facets of socioemotional development provide additional valuable information. Finally, drawing on theoretical approaches and empirical findings, we considered a number of influential control variables to enhance the specificity of the investigated effects.

There are some limitations to this study. First, the data used in this study were collected two decades ago. Findings suggested that simple generalizations from monolinguals to different groups of bilinguals (or vice versa) are not justified. Aggregation across groups may also lead to results that are not valid for different subgroups. This could be particularly important when considering the increasing number of immigrants worldwide. In principle, we expect our findings on the investigated association to still hold for MOEN and ML-DLLs, although in the latter case, this may depend on the issues of integration into a particular society and the relation to the same language group in the society. A closer examination is needed. A larger sample of EM-DLLs (as compared to this study) might allow us to detect significant bidirectional associations between expressive vocabulary and total difficulties, as we discussed earlier. Again, it remains to be investigated whether the association in this group is simultaneously moderated by other factors (integration, parents' proficiency in the majority language). Second, missingness in children's language and socioemotional outcomes is not random (as suggested by significant differences between participants and nonparticipants in terms of parental education level, parents' migration background, and children's sex). Nonrandom missingness may have increased the mean percentile score for language and socioemotional outcomes. However, the amount of missing data in this study is relatively small (0.1%–6%), and utilizing FIML and sample weight may have improved the generalizability of the findings. Third, as we aimed to focus on early childhood, this study examined a relatively short, though important, span of development (3 to 5 years of age). Future studies could extend the time period and test whether these findings hold for older children to reveal whether changes in the magnitude and direction of the association between language and socioemotional outcomes are observed. Another reason that we could not extend our models beyond 5 years of age is that no measure of expressive vocabulary was conducted in Wave 4 when children were 7 years old. Fourth, due to the available measurements of two time points, we could not use superior cross-lagged models, such as random-intercept cross-lagged panel models to disaggregate the between and within-personal effects, as such models require at least three measurements for each of the involved variables (Hamaker et al., 2015). This might limit the possibility of being able to determine the bidirectional causality (Hamaker et al., 2015). However, the theoretically and empirically supported control variables can enhance the robustness of the results.

Fifth, socioemotional development was reported by parents, rather than by teachers as compared to previous studies (e.g., Ertanir et al., 2021; Ren et al., 2016). This could indicate limited accuracy, as parents might be influenced by social desirability and given stereotypes about child characteristics. Furthermore, DLLs' parents with different majority language skills might have different interpretations and understandings of SDQ items. However, results from the measurement invariance tests (i.e., SDQ is equivalent across groups) indicate that the findings can be interpreted meaningfully. Furthermore, differences between parent and teacher reports might also be due to context-specificity of child behavior. However, not all children in our study attended ECEC at age 3 and the teacher-reported data are only available for older children. In addition, although the reliability of the prosocial behavior subscale was not very high (e.g., $\alpha = .66$, $\omega = .66$ at age 3), previous studies using SDQ with alternative samples revealed a good fit of the measurement model (e.g. Huang, Weinert, von Maurice, et al., 2022). Yet, future studies could expand our findings using multi-informant assessment and more in-depth questionnaires. Sixth, our models did not control for children's nonverbal cognition and harsh parenting behavior as Girard et al. (2017) did—who used the same data set and found significant associations with both children's language and socioemotional outcomes. Although Bracken School Readiness Assessment-Revised (BSRA-R; Panter & Bracken, 2009) might not be the perfect measure of nonverbal cognition, we additionally conducted sensitivity analyses by including BSRA-R and harsh parenting behavior (indicated by the Conflict Tactics Scale; Straus & Hamby, 1997) into the models. We found similar results for the full sample and for the different language groups as compared to our original models (see Figures S7 and S8). Note that—due to no harsh parenting behavior being observed in the group of ML-DLLs—the additional multigroup model for different language groups could only consider BSRA-R. The comparability of results further underlines the robustness of our findings.

Seventh, although the focus of our study is majority language and socioemotional development, it would be additionally important to have measures of children's minority language skills. As discussed above, children's minority language might be responsible for their socioemotional development partially through additional pathways. Thus, considering the influence of minority language skills would allow us to examine the relations between language and socioemotional development in DLLs children in a more comprehensive way (e.g., Sun et al., 2021). Finally, in our study, we only considered expressive vocabulary as a measure of child language. Although disparities in expressive vocabulary according to family language background have been shown to emerge between monolinguals and DLLs from early on (Oller et al., 2007), and although expressive vocabulary is related to skills in other domains, it is still only one facet of children's language competence. Thus, future studies might consider further facets of language skills such as receptive vocabulary, grammatical skills, and pragmatics when investigating relations between language and socioemotional development (see, e.g., Rose et al., 2018, 2022). Our measure differentiating between the two DLLs groups does not capture the broad variety of differences between children growing up with more than one language. Thus, more in-depth analyses are warranted. Nevertheless, even the measure of expressive vocabulary shows that the interrelation between developmental domains might vary across different groups of children.

Practical implications

Findings from our study shed light on the directionality of the association between language and socioemotional development of young children with different language backgrounds. These findings have implications for meeting the needs of young children with different language backgrounds, signifying a potential need to enhance their majority language and socioemotional development in early childhood. Fostering children's socioemotional development might help them get access to the majority language. At the same time, fostering majority language skills might help children better integrate into peer groups (speaking the majority language), which in turn might further support majority language progress. Especially for those DLLs who speak little or no majority language at home, parents could be advised to choose ECEC for their children, in order to increase the opportunities of getting in touch with native speakers and to immerse their children in the majority language environment. Advanced social skills seem to be important in this case. Caregivers from ECEC could pay more attention to promoting DLLs' majority language skills. For example, establishing conversations about prosocial behaviors and inner states could not only enhance the development of prosocial behaviors directly (Brazzelli et al., 2021), but also increase the verbal interactions (in the majority language). Furthermore, child-directed prevention, such as discussing and practicing (group) rules (Burger, 2015), could also efficiently promote successful interactions with peers.

CONCLUSION

Given that diverse social interactions are crucial for language and socioemotional development, this study supported the assumption of bidirectional association between majority language and socioemotional outcomes for young monolinguals over a 2-year period. Furthermore, findings also demonstrated that the association between these two domains differs between different DLLs groups. That is, for DLLs who have acquired basic majority language skills, the majority language skills play an important role in their socioemotional development. Conversely, for DLLs who have limited majority language skills, their socioemotional development seems to be essential for majority language development. Programs which increase opportunities to access the majority language addressing children's socioemotional development could be particularly beneficial for DLLs.

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DATA AVAILABILITY STATEMENT

The data used in the present study are publicly accessible (http://ukdataservice.ac.uk). The analytic code necessary to reproduce the analyses is publicly accessible (https://osf.io/2se7p/). The questionnaire used to assess children's socioemotional skills in the present study is publicly accessible (https://www.sdqinfo.org/py/sdqinfo/b3.py?language=Englishqz(UK)). The study's design and the analyses were not pre-registered.

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SUPPORTING INFORMATION

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

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