Acquisition of the majority language in Norwegian ECEC: Relating language-learning environment in ECEC to expressive vocabulary

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Abstract

Developing proficiency in the language(s) spoken in any given society is crucial for the inclusion and attainment of children in that society. With an enrolment rate in Norwegian early childhood education and care (ECEC) of 93.4% for children between age one and five, ECEC constitutes an important out-of-home learning environment for children in Norway. In this study, we examine how the quality of language-learning environments in toddler and preschool groups predicts children's expressive vocabulary in the majority language depending on children's home languages. Data from the quality rating scales ITERS-R

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and ECERS-R were used to model quality factors related to expressive vocabulary in toddler and pre-school groups. The sample included 1,078 children (876 children with parents who spoke the majority language exclusively, 104 children with one parent who spoke the majority language and one parent who spoke another language, and 57 children with no majority language speaking parents). The results show that the quality of the language-learning environment in toddler and preschool groups is positively associated with expressive vocabulary in the majority language at age three and five, but only for children whose parents spoke the majority language exclusively.

Keywords: *dual language learners; ECEC quality; expressive language; GoBaN*

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Introduction

Developing proficiency in the language(s) spoken in any given society is crucial for the inclusion and participation of children in that society, and language skills in the majority language are powerful predictors for later attainment (Ulferts et al., 2019; Vandell et al., 2010). In Norway, with an enrolment rate of 93.4% for children between age one and five (Statistics Norway, 2021b), early childhood education and care (ECEC) constitutes an important out-of-home learning environment in the majority language for children. In multilingual societies where ECEC, primary and secondary schools rely primarily on the majority language (in this case, Norwegian), many dual language learners will depend on high quality encounters with this language outside their home. This situation resembles the situation of many multilingual children attending mainstream education in Europe, where instruction in the majority language is the norm (OECD, 2018).

The quality of ECEC is often measured in terms of structural and process quality, where aspects of structural quality (e.g., group size and teacher-child ratio) are understood as a precondition for process quality (e.g., staff-child interactions), with process quality being the most proximal determinant for children's development (Melhuish et al., 2015; OECD, 2015). Staff's engagement in high-quality interactions with children and provision of a rich and varied play and learning environment are found to be important process quality factors predicting child development in early years (Melhuish et al., 2015; Ulferts et al., 2019). However, research has shown that the quality of Norwegian ECEC varies (Rege, et al., 2018), falling between the minimal to moderate level when using quality rating scales (Bjørnestad et al., 2020; Bjørnestad & Os, 2018).

A substantial proportion of the literature finds positive effects of ECEC attendance on language development (Melhuish et al., 2015; Ulferts et al., 2019), and this pattern is also found within a Scandinavian context (Hansen & Broekhuizen, 2021; Holmgren, 2009; Lekhal et al., 2011). Previous research has also found positive associations between ECEC quality and language development in early years, and that high-quality language-learning environments seem to be characterised by responsive and communicative practices (Hansen & Broekhuizen, 2020; Justice et al., 2018; Li et al., 2013). Studies

concentrating on dual language learners, have also reported a similar relationship (Drange & Telle 2015; Jensen et al., 2009), finding that the longer dual language learners attend ECEC, the better (Bråten et al., 2014; Karlsen, 2014). A systematic review of language-focused interventions targeted at dual language learners in ECEC found overall positive effects on majority language learning (Larson et al., 2020). The most effective interventions were linguistically and culturally responsive, in terms of including children's home language and cultural background in practices, activities and materials (Larson et al., 2020).

However, it is not clear whether the effect of ECEC quality differs between children whose parents speak the majority language exclusively, and dual language learners. The aim of this study is therefore to explore how the effects of the quality of the language-learning environment provided in ECEC differ in terms of impact on expressive vocabulary in the majority language among children with diverse home language experiences in their early years.

Dual language development

Learning a second language takes time. Cummins (2000) claims that while it takes about two years to obtain a proficiency suitable for everyday use, it may take as many as five to seven years to learn language at a level that is appropriate for schooling. Learning two or more languages for daily use may also mean that the input in each language is relatively small compared to using only one language every day, making comparisons unfair between dual language learners and monolingual children (e.g., Ortega, 2019). Hence, it is not surprising that dual language learners maintain a poorer language development trajectory compared to children whose parents speak the majority language exclusively, when only the majority language is considered (Bornstein et al., 2016; Karlsen et al., 2021; McCabe et al., 2013). This is also the case in Norway, where studies have shown that dual language learners score lower than their majority-language learning peers (Gunnerud et al., 2018; Melby-Lervåg & Lervåg, 2014).

A review by Hammer et al. (2014) argues that the gap in majority language (expressive) skills between children whose parents speak the majority language exclusively and dual language learners depends on when the latter were first exposed to their second language (i.e., simultaneously or successively) and the usage of this same language. Age of introduction to the majority language also turned out to predict majority language skills in a Norwegian study (Karlsen et al., 2017). The gap in expressive skills in the majority language seems to persist from toddlerhood throughout preschool between majority language speakers and dual-language learners (Hammer et al., 2014). A study by Gunnerud et al. (2018) replicated these findings in a Norwegian context by showing that children

with either one or two Norwegian-speaking parents in the household outperformed children with no Norwegian-speaking parents in the household on measures of comprehension in Norwegian. Contrary to assuming a simple relationship between input and output, they suggest that there may exist a threshold for the amount of majority language input required for dual language children to keep up with their majority-language learning peers on majority language measures (Gunnerud et al., 2018).

The influence of learning environment on dual language learning

There is a broad consensus that language development is significantly influenced by the social context (Hoff, 2006), and a substantial part of the variation in children's early language skills is due to disparities in language exposure (Walker et al., 2019). Children learning two or more languages from an early age vary widely in their experiences with languages, and their expressive vocabulary in the majority language seems to depend in part on the quality of input (Hammer et al., 2014; Hoff, 2013). This is demonstrated in a recent Norwegian study by Rydland and Grøver (2020), showing that the home literacy environment, one example of input quality, predicted dual language learners' first- and second-language vocabulary skills.

Since most children in Norway attend ECEC, ECEC constitutes an important part of children's social context and a significant learning environment. Overall, positive effects of attending high-quality care have been documented, especially for children from disadvantaged backgrounds (Dearing et al., 2018; Melhuish et al., 2015) and dual language learners (Phillips et al., 2017). Rydland and Grøver (2020) also show that duration of ECEC attendance is positively associated with vocabulary scores in the majority language. However, they argue that a measure of quality is needed to determine whether time spent in ECEC itself constitutes a unique predictor (Rydland & Grøver, 2020).

One of the factors that is part of a high-quality language-learning environment in ECEC is the inclusion of all children in activities and daily conversations. This is particularly important for children with poor majority language skills. Sadownik (2020) described Polish-Norwegian children's experiences of exclusion and inclusion in a Norwegian ECEC, showing that some of them were deprived of meaningful interactions in Norwegian with peers and staff, while others were, for example, offered weekly Norwegian language support by a teacher. Other studies have shown that even when the children are included by the teachers, dual language learners are not offered opportunities to partake in more advanced conversations, as their knowledge and experiences are met differently than the majority language speaking children (Giæver, 2020; Karlsen et al., 2018; Palludan, 2007; Rydland, 2007). Additionally, proficiency in the majority language can affect the extent to which dual

language learners are included in peer play (Bundgaard & Gulløv, 2008; Karrebæk, 2011). Because free play is considered an important source of language learning (e.g., Rydland et al., 2014; Öhman, 2012), ensuring that dual language learners have ample access to play is an important strategy for supporting their language development.

The Norwegian ECEC context

Norway has a (near) universal ECEC program, and all children between one and five have the right to attend publicly regulated and subsidised ECEC. The uptake rate is high (93.4%) for children aged one to five. Most children (87%) are enrolled before the age of three, and 19.5% of the children are from linguistic and cultural minorities (Statistics Norway, SSB 2021b). Almost all children (97.3%) attend full time (7–9 hours a day). Children are often divided into age-based groups, with groups for toddlers (ages 1–3) and pre-schoolers (ages 3–6) being slightly more common than mixed age groups (ages 1–6). The staff working with children in ECEC consists of ECEC teachers with a bachelor's degree in early childhood education, in addition to child and youth workers with vocational education and assistants with no specific qualification. The staff-child ratios are one caregiver per three children (1:3); one teacher per seven children (1:7) for children under the age of three; one caregiver per six children (1:6); and one teacher per fourteen children (1:14) for children over the age of three.

In terms of organization, 53% of Norwegian ECEC centres are privately owned, and 47% publicly owned (owned by the municipality). All Norwegian ECEC centres are also required to implement the Kindergarten Act (Norwegian Directorate for Education and Training, 2005) and follow the guidelines from the National Framework Plan for Kindergartens (Norwegian Directorate for Education and Training, 2017). The Framework Plan gives a broad set of guidelines for the content of ECEC centres within seven learning areas. Supporting language use and development for all children is defined as an overall aim, and the content is specified in the learning area "Communication, language, and text". The Framework Plan is rooted in the Nordic tradition with a holistic approach emphasising care over education and a play-based pedagogy over direct instructional activities (Bjørnestad et al., 2020). There are, however, no specific guidelines for how the learning areas are to be implemented, nor any benchmarks for children's development.

Regarding language, the Framework Plan requires ECEC staff to "encourage multilingual children to use their mother tongue while also actively promoting and developing the children's Norwegian/Sami language skills" (Ministry of Education, 2017, p. 24). Although the Framework Plan sets up this dual goal for ECEC centres, centres are predominantly thought of as important arenas for integration and majority language learning (see Bråten et al., 2014; Karlsen, 2014). Hence, there is a focus on teaching children Norwegian.

The language-learning environment for dual language learning children may be characterised as "assimilative" or "supportive", following the categorization presented by Chumak-Horbatsch (2012, pp. 39–40), in the sense that most activities take place in Norwegian, but that in some ECEC centres, the staff use certain words, sing songs, or occasionally read books in other languages (Alvestad et al., 2019; Romøren et al., 2023).

The current study

The foregoing literature shows that there is a need for quantitative explorations of the interplay between the quality of the language-learning environment in ECEC and children's language development that also take the diverse language experiences of children into consideration. The primary aim of this study is to assess how the association between the quality of the language-learning environment in Norwegian ECEC centres and children's majority language development (expressive vocabulary at age 3 and 5) is dependent on the language(s) spoken by the parents at home. Based on previous quantitative work showing that dual language learners benefit from the language-learning environment in ECEC (e.g., Melhuish et al., 2015; Phillips et al., 2017), we hypothesized that children whose parents speak a language other than Norwegian at home (i.e., dual language learners) would benefit particularly from exposure to a *high-quality* language-learning environment in ECEC with regard to their majority language development. To our knowledge, this is the first study addressing how languages spoken at home relate to the association between the quality of the language-learning environment in ECEC and expressive vocabulary in the majority language in a Norwegian context.

Method

Sample and procedure

In this study, we used data from Better Provision for Norway's Children in ECEC (BePro/GoBaN – www.goban.no), a research project that explored the quality of ECEC in Norway and its implications for children's development. In total, 1,200 children (born in 2011 and 2012) were recruited from over 90 centres randomly drawn from a pool of private and public ECEC centres. The data in this study come from the first (T1 – age 3) and second (T2 – age 5) point in time, and encompass quality assessment in ECEC, interviews with parents, and individual assessments of children's verbal skills. The attrition rate from the first to second point in time was around 21%, and less than 5% withdrew from the project. In this study, our analytical sample includes 1,078 children (with non-missing outcomes at age three; 48% girls). Of these, 863 children had parents who spoke Norwegian, Danish or Swedish exclusively at home (labelled 'majority'). The two dual language learners groups

consisted of 102 children who had one majority language speaking parent and one parent who spoke another language (labelled 'mixed'), and 52 children with parents who only spoke other languages than the majority language (labelled 'minority'). The categories were coded based on information parents provided concerning the languages spoken at home. The choice of categories (labels) is therefore a pragmatic one, relying on the amount of exposure to the majority language and should not be interpreted as referring to the majority/minority status of the children, nor to their nationality. In total, 51 different languages were spoken at home by the parents. The most common languages used were English, German, Spanish, Lithuanian, Polish, French, Russian, Turkish, and Somali, which is in line with the national statistics on the Norwegian migrant population (Statistics Norway, 2021c). The sample did not include children whose parents spoke Sami at home.

The observations concerning ECEC quality were conducted by trained and certified researchers (i.e., reliable above the 80% level), in line with recommendations from the developers of the ERS scales (ersi.info). The quality of toddler groups was rated with the ITERS-R at the first point in time, and the quality of preschool groups was rated with the ECERS-R at the second point in time. Assessment of the children's verbal skills was carried out in familiar surroundings in the ECEC centre, and each child was accompanied by a trusted staff member to provide a secure and pleasant situation for all of the children. The staff were also asked to inform the parents and children about the purpose of the data collection and the test procedure in advance. All staff members participating in the test situation were instructed not to intervene. Parents reported use of language at home in a survey. All the data were collected when the children were approximately three (T1) and five years (T2) of age. The study was approved by the Norwegian Centre for Research Data (NSD) and the Norwegian Data Protection Authority.

Measures

Expressive language in Norwegian

A translated version of the subscale 'naming vocabulary' from the British Ability Scale 3 (Elliot & Smith, 2011) was used to measure expressive language in Norwegian. The subscale was translated by the GoBaN research team. The test consists of 31 items (pictures) depicting different objects, and the children were asked to name the objects, providing a measure of productive vocabulary. The subtest is a part of an early years cognitive battery for ages three to seven, and raw scores from the test are converted into ability scores to adjust for assessment-specific biases. The ability scores have been included in previous Norwegian studies as outcome measures (Eliassen et al., 2017; Hansen & Broekhuizen, 2020). In this study, we fitted measurement models to reduce measurement error using a Weighted Least Squares Mean and Variance (WLSMV) adjusted estimator due to the categorical indicators. Missing cases were addressed using pairwise likelihood (PL) imputation. In the initial analysis, all age-specific items were included in

separate models: age three in item 1–24 and age five in item 11–36. Two items (31 and 36) were discarded from the age five verbal skills due to low factor loadings. Both models showed good fit (age three: CFI/TLI: .968/.965, RMSEA:0.032 [.028-.036]; age five: CFI/TLI: .967/.964, RMSEA: 0.20 [.015-.025]). The model predictions from the measurement models were extracted and subsequently included as continuous latent variable outcome measures in the regression models.

Quality of language-learning environment

The quality of the language-learning environment was measured using The Infant/Toddler Environment Rating Scale-Revised (Harms et al., 2006) when the children were attending toddler groups (age 3), and Early Childhood Environment Rating Scale-Revised (Harms et al., 2005) when the children were attending preschool groups (age 5). These are measures developed as a global concept of quality focusing on multiple processes related to supporting child development. We used the revised versions (ITERS-R/ ECERS-R) of the quality rating scales since the most current versions (ITERS-3/ ECERS-3) were not available at the time of data collection. Moreover, to a large degree, the ITERS-R scale addresses pedagogical quality as described in the Framework Plan (Bjørnestad et al., 2019). The quality rating scales are divided into several subscales covering different aspects of the learning environment in ECEC (e.g., Space and Furnishing, Activities, Interactions, Program Structure). In total, the ITERS-R includes 378 indicators (i.e., observational categories), and ECERS-R 383. These cover a wide range of developmental, health and safety aspects (the subscale 'Parents and Staff' was not included). The scales' validity has been criticised in terms of ability to capture core aspects of quality (i.e., construct validity) and ability to predict child development (i.e., criterion validity) (e.g., Gordon et al., 2013; Mayer & Beckh, 2016).

To acquire a more domain-specific measure of quality and thus capture the pedagogical processes supporting verbal development, we selected theoretically relevant indicators from ITERS-R and ECERS-R. To summarise our selected indicators, a high-quality language-learning environment entails that ECEC staff support both children's language *comprehension* and language *use*. Supporting language *comprehension* implies that ECEC staff talk to the children throughout the day and use personal, simple, descriptive words and an increasing degree of complexity with children's age and progression. The staff use a wide range of words and engage in meaningful conversations on various topics, such as describing what children do and potentially feel. To support children's *use* of the language, a high-quality language-learning environment entails that staff respond at an appropriate pace and in a positive way to the children's attempts to communicate – not necessarily limited to verbal language. The staff have many turn-taking conversations with children; they add words, ask questions and at the same time have a good balance between listening and talking (Harms et al., 2006; Harms et al., 2007). Thus, selected indicators are mainly related to staff and peer verbal and non-verbal interactions, while indicators related to play materials were excluded at this stage.

We then fitted two measurement models, including the selected indicators, to account for measurement error and test construct validity. The initial selection of indicators contained 74 indicators from ITERS-R and 64 indicators from ECERS-R. From the initial selection, 23 indicators from the ITERS-R language factor and 20 from the ECERS language factor were discarded due to low factor loadings. The final models included 51 indicators from the ITERS-R and 44 indicators from the ECERS-R (see table A.1 and A.2 for list of selected indicators). All variables (indicators) were treated as ordinal in the analyses, and the WLSMV estimator was used to deal with the categorical nature of the data. Model fit was reported and evaluated with robust goodness-of-fit indices following common recommendations (see Hooper et al., 2008). Both models showed good model fit: ITERS language factor (CFI/TLI: .956/.954, RMSEA:0.032 [.025-.037]) and ECERS language factor (CFI/TILI: .941/.936, RMSEA:0.044[.038-.049]). Missing cases were dealt with using pairwise likelihood (PL) imputation when constructing the measurement models.

Covariates

Information on age at entry into ECEC was reported by the parents in months and included as a covariate. The ECEC centre leaders completed a survey at both points in time (T1 and T2) to collect additional information on structural characteristics of their centres, and we included centre size and proportion of dual language learners in the centre as covariates. Centre locations (regions) were included as dummy variables.

Analytical approach

We used ordinary least squares (OLS) regression to estimate the effect of the quality in language-learning environments in toddler and preschool groups on expressive vocabulary for children in separate models. In total, we estimated eight regression models (Table 2 and Table 3) to test whether children's expressive vocabulary varied as a function of the quality in the language-learning environment in ECEC depending on children's home language. All models were fitted by regressing expressive vocabulary on quality and controlling for centre size, ratio of dual language learners and region. First, we ran the regression models on the full sample to test the effect of quality on expressive vocabulary at age three and five, respectively. Second, we ran the regression models on three subsamples based on the languages spoken in the families (majority, mixed and minority) to investigate how home language was related to the association between ECEC quality and expressive vocabulary in Norwegian. Thus, all four models at each point in time contained the same variables (Table 2 and Table 3). To deal with missing data, we used listwise deletion. In our full sample (n = 1,078), we had missing data on grouping variable home language (6%), expressive vocabulary outcome measure (10%) and quality assessment (20%) at the second time point. To account for within-cluster correlated errors (children nested in centres) we reported cluster-robust standard errors on the centre level.

Results

Descriptive statistics for the outcomes, predictors and covariates are presented in Table 1 for the full sample and divided by the three groups of language used at home. As expected, the results show that in the majority group, the children have significantly higher expressive vocabulary scores in Norwegian at age three and five compared to the mixed and minority groups (age three: F(2) = 89.8, p < 0.0, age five: F(2) = 73.65, p < 0.001, all three group comparisons, ps < 0.001).

Table 1. Descriptive statistics: means and standard deviations for outcome and predictor variables for full sample and by home language.

	Full sample	Majority	Mixed	Minority
Outcomes				
Expressive vocabulary in Norwegian T1	−0.03 (0.61), N = 1,078	0.06 (0.55), N = 863	−0.31 (0.64), N = 102	−0.91 (0.59), N = 52
Expressive vocabulary in Norwegian T2	−0.01 (0.81), N = 970	0.13 (0.74), N = 787	−0.49 (0.76), N = 94	−1.01 (0.67), N = 46
Predictors and covariates				
ITERS-R language factor	0.03 (0.74), N = 1,069	0.04 (0.75), N = 857	0.05 (0.75), N = 102	−0.13 (0.62), N = 52
ECERS-R language factor	0.00 (0.58), N = 859	−0.01 (0.56), N = 698	0.07 (0.66), N = 81	−0.05 (0.6), N = 43
Centre size T1	90.92 (48.02), N = 992	90.86 (46.81), N = 794	84.49 (42.78), N = 92	78.94 (42.02), N = 50
Centre size T2	90.63 (66.71), N = 1,042	94.19 (68.38), N = 832	89.46 (66.54), N = 98	84.59 (63.17), N = 51
Proportion of dual language learners in ECEC centre T1	0.12 (0.11), N = 946	0.11 (0.1), N = 756	0.15 (0.12), N = 87	0.18 (0.12) N = 47
Proportion of dual language learners in ECEC centre T2	0.16 (0.13), N = 967	0.13 (0.1), N = 759	0.15 (0.12), N = 97	0.22 (0.12), N = 50
Age at entry into ECEC (in months)	14.26 (3.9) N = 1,078	14.51 (3.7) N = 855	15.43 (4.8) N = 99	16.24 (5.4) N = 51

Note: Mean (SD)

We found a significant positive effect (β = 0.105, p = 0.001) for the ITERS-R language factor on expressive vocabulary in Norwegian at age three in the full sample, adjusted for age at entry into ECEC, proportion of dual language learners, centre size, and region (see Table 2). Applying the same regression model to the three different groups based

Table 2. Regression results: expressive vocabulary in Norwegian at age three as predicted by the ITERS-R language-learning environment factor, with covariates, for full sample and stratified by home language.

	Full sample	Majority	Mixed	Minority
	β (SE)	β (SE)	β (SE)	β (SE)
ITERS-R language factor	0.105 (0.038)**	0.099 (0.036)**	−0.041 (0.125)	−0.098 (0.110)
Proportion of dual language learners T1	−0.174 (0.022)***	−.091(0.031)*	−.307 (0.078)**	0.123 (0.162)
Centre size T1	0.063 (0.030)*	0.025 (0.033)	−0.038 (0.082)	−0.386 (0.117)**
Age at entry into ECEC	−0.010 (0.008)	0.011 (0.100)	−0.033 (0.024)	−0.050 (0.021)*
Observations	*876*	*743*	*85*	*46*

*** p<0.001, **p<0.01, *p<0.05. Dependent variable: expressive vocabulary at age 3. Covariates related to region have been omitted from the presentation to preserve regional anonymity. Standard errors in parentheses.

on home language showed a positive significant effect for the majority group ($\beta = 0.099$, $p = 0.006$). In addition to the non-significant effects for the other two groups, the effect sizes changes to negative, indicating a reversed relation between high-quality language-learning environment and expressive vocabulary in Norwegian in the mixed and minority groups.

Table 3 shows that expressive vocabulary in Norwegian at age five was positively related to the quality of the language-learning environment in preschool groups for children in the majority group ($\beta = 0.122$, $p = 0.026$), adjusting for age at entry into ECEC, proportion of dual language learners, centre size, and region. The results were non-significant for the other two groups; however, the trend shows a positive relation between the quality of the language-learning environment and expressive vocabulary in Norwegian in the mixed and minority groups.

Table 3. Regression results: expressive vocabulary at age five as predicted by the ECERS-R language-learning environment factor, with covariates, for full sample and stratified by home language.

	Full sample	Majority	Mixed	Minority
	β (SE)	β (SE)	β (SE)	β (SE)
ECERS-R language factor	0.075 (0.047)	0.122 (0.054)**	0.135 (0.145)	0.042 (0.185)
Proportion of dual language learners T2	−0.259 (0.046)***	−0.106 (0.041)*	−0.275 (0.145)*	0.068 (0.183)
Centre size T2	0.057 (0.023)*	0.014 (0.027)	0.106 (0.070)	0.214 (0.338)
Age at entry into ECEC	−0.001(0.009)	−0.002 (0.011)	.026 (0.025)	0.069 (0.048)
Observations	*771*	*624*	*76*	*42*

*** $p<0.001$, **$p<0.01$, *$p<0.05$. Dependent variable: expressive vocabulary at age 5. Covariates related to region have been omitted from the presentation. Standard errors in parentheses.

Discussion

In this study, we examined how the quality of the language-learning environment for toddlers (age 3) and preschoolers (age 5) predicts children's expressive vocabulary skills in the majority language depending on the children's home languages. The results show that the quality of the language-learning environment in toddler and preschool groups is positively associated with expressive vocabulary in the majority language at age three and five, but only for children in the majority group. From the outset, the majority group had significantly better expressive vocabulary in Norwegian compared to dual language learners (i.e., children in the mixed or minority group), and the gap in skills did not decrease from age three to five years – irrespective of the quality of language-learning environment provided in ECEC. In fact, dual language learners scored relatively lower at age five compared to the majority group. These results contrast with our initial hypothesis that dual language learners would benefit more than the majority group children from exposure to a high-quality language-learning environment in ECEC.

Overall, and in accordance with previous research (Gunnerud et al., 2018; Karlsen et al., 2017), dual language learners had significantly lower expressive vocabulary skills

in Norwegian compared to the majority group at age three and five. Likewise, previous research has identified this gap in performance between children whose parents speak the majority language exclusively and dual language learners (Melby-Lervåg & Lervåg, 2014), and it seems that time spent in ECEC does not necessarily reduce this gap (Gunnerud et al., 2018). Gunnerud et al. (2018) argue that dual language learners require more Norwegian input than they are currently exposed to in ECEC to acquire a level of Norwegian comparable to their peers with parents who speak Norwegian exclusively.

Language acquisition depends on environmental input, and dual language learners are in general likely to receive less exposure to the majority language than children with majority language speaking parents. This was also the case in our sample, as the average age of enrolment was higher for dual language learners than for children whose parents speak the majority language exclusively. Nevertheless, adjusting for age at enrolment in our models did not account for the developmental differences between groups. Our results are supported by Eliassen (2018), who also found that age at enrolment does not predict expressive vocabulary in Norwegian at age three after adjusting for time spent in ECEC. In contrast, Grøver et al. (2020) found that duration of ECEC attendance was related to vocabulary outcomes in Norwegian. However, they underscore the need for quality measures in the learning environment to determine whether duration of ECEC attendance constitutes a unique predictor of language proficiency. We also need to consider that it takes time to acquire a new language, and even more time to acquire it as an academic tool that is useful in school (Cummins, 2000).

Particularly relevant for the objective of this study was that our results suggest that the quality of the language-learning environment demonstrated relatively stable significant associations with expressive vocabulary in Norwegian from toddlerhood to preschool age, but only for children in the majority group. The lack of significant associations for the groups of dual language learners is somewhat surprising, and it is noteworthy that the relationship tends to be negative for toddler dual language learners. Finding significant associations between the language-learning environment and expressive language skills is in line with previous research showing such positive effects (Grøver et al., 2020; Hansen & Broekhuizen, 2019; Ulferst et al., 2019). However, the lack of association between the quality of the language-learning environment and vocabulary skills in the majority language for dual language learners is somewhat puzzling, considering that the quality factor developed in this study was constructed by selecting indicators from ITERS-R and ECERS-R related to literacy activities; varied and inclusive conversational staff–child and child–peer interactions; and staff support in free play activities, to name a few relevant content areas. In other words, the aspects included are in line with previous research as important practices for supporting language development for all children.

One reason for not finding an association between the quality of language-learning environment and expressive vocabulary in Norwegian for dual language learners may be

that the learning environment provided is not sufficiently linguistically and culturally sensitive. Most of the indicators require children to freely choose to participate in activities, which for dual language learners can result in less interaction with staff and peers and the exclusion of some children (see Sadownik, 2020). Varied conversations, role-play and reading require sophisticated language skills, making it more difficult for children with limited majority language skills to participate in such activities. In free play, children choose playmates freely, often leading dual language learners to play with each other and therefore limiting each other's exposure to rich vocabulary in the majority language (Bundgaard & Gulløv, 2008; Karrebæk, 2011; Puskás & Björk-Willén, 2017). Our findings extend previous research by suggesting that the quality of the language-learning environment may be better suited for children with parents who speak Norwegian exclusively.

Recent research finds that the quality of Norwegian ECEC falls between the minimal to moderate level (Bjørnestad et al., 2020; Bjørnestad & Os, 2018), and that linguistic and cultural diversity is included in daily activities to a minimal extent (Alvestad et al., 2019). This is concerning, given that the most effective approach to reducing the achievement gap between the majority group and dual language learners includes a more linguistically and culturally sensitive approach, such as incorporating children's home language and materials relevant to their cultural background in practices and activities (Larson et al., 2020). In Norway, ECEC teachers are required to implement the content of the Framework Plan to ensure quality in the language-learning environment for all children. However, since the guidelines provided by the Framework Plan are broad and non-specific in terms of implementation, the knowledge and competence of staff becomes crucial for the quality children experience on a day-to-day basis. Previous research has shown that ECEC teachers are uncertain about how to provide a stimulating and meaningful language-learning environment for dual language learners (Alstad, 2020; Alstad & Mourão, 2021), despite having a bachelor's degree. Consequently, there seems to be a need for both preservice and in-service professional development to improve competence in how to support language development for dual-language learners.

There are some limitations in this study that should be considered when interpreting the results. First, we have small subgroups of dual language learners – children in the mixed or minority group – suggesting that the results should be interpreted with caution. Moreover, at the time of recruitment (children born 2011 and 2012), there was a lower participation rate in ECEC for toddlers from linguistic minority backgrounds than today (Statistics Norway, 2021a). Second, the language assessments were conducted in Norwegian, and the instructions and content were presented in Norwegian, all of which could affect the performance of children with limited proficiency in the majority language – in spite of attempts to create a pleasant test situation for the children. Third, we evaluated expressive vocabulary, which is only a small part of language development, and did not explore, for example, the relation between the production and perception

of language. Future research could include a more comprehensive measure of language, while also taking into account the children's first-language skills. Finally, in this study, we explored language stimulation in ECEC in general, without specific attention to support for dual language learners. Exploring the influence of support of home language in ECEC might yield different results. It may be that dual language learners would benefit more from an environment where their home language is used, so that these children would feel more supported and included.

Conclusion

In sum, we found that children whose parents spoke the majority language exclusively had significantly better expressive vocabulary skills in Norwegian compared to dual language learners, and that this gap in skills did not decrease from age three to five years – regardless of the quality of language-learning environment provided in ECEC. One important policy implication from this study, is the need for increased resources, awareness and competence dedicated to dual language learners' language development through enriched and stimulating language-learning environments in ECEC.

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Appendix

Table A1. Table of factor loadings for ITERS-R language-learning environment factor.

Indicator	Estimate
Indicator 6.3.1	0.840
Indicator 6.5.1	0.650
Indicator 8.5.3	0.578
Indicator 9.5.4	0.703
Indicator 12.3.1	0.827
Indicator 12.3.2	0.620
Indicator 12.3.3	0.935
Indicator 12.3.4	0.691
Indicator 12.5.1	0.829
Indicator 12.5.2	0.755
Indicator 12.5.3	0.911
Indicator 12.5.4	0.745
Indicator 12.7.1	0.706
Indicator 12.7.3	0.656
Indicator 13.3.1	0.901
Indicator 13.3.2	0.804
Indicator 13.5.1	0.837
Indicator 13.5.2	0.781
Indicator 13.5.3	0.831
Indicator 13.7.1	0.710
Indicator 13.7.3	0.527
Indicator 13.7.4	0.572
Indicator 14.3.3	0.530
Indicator 14.3.4	0.746
Indicator 14.5.4	0.458
Indicator 25.3.2	0.691
Indicator 25.5.1	0.813
Indicator 25.5.2	0.832
Indicator 25.5.3	0.823
Indicator 25.5.4	0.833
Indicator 25.7.2	0.799
Indicator 25.7.3	0.731
Indicator 26.5.1	0.777
Indicator 26.5.2	0.849
Indicator 27.3.1	0.873
Indicator 27.3.2	0.850
Indicator 27.3.3	0.860
Indicator 27.3.4	0.810
Indicator 27.5.1	0.868
Indicator 27.5.2	0.801
Indicator 27.5.3	0.704
Indicator 27.7.1	0.708
Indicator 27.7.2	0.746
Indicator 28.7.2	0.526
Indicator 29.3.2	0.579
Indicator 30.3.2	0.706
Indicator 30.5.2	0.756
Indicator 30.7.1	0.685
Indicator 31.3.3	0.964
Indicator 31.7.1	0.604
Indicator 31.7.2	0.705

Note: Standardised factor loadings are reported. Variable name refers to indicator number, quality level and question number.

Table A2. Table of factor loadings for ECERS-R language-learning environment factor.

Indicator	Estimate
Indicator 9.5.1	0.609
Indicator 10.5.1	0.486
Indicator 10.5.2	0.836
Indicator 10.7.3	0.811
Indicator 13.7.1	0.651
Indicator 16.3.1	0.475
Indicator 16.5.1	0.841
Indicator 16.7.1	0.753
Indicator 17.3.2	0.670
Indicator 17.5.1	0.413
Indicator 17.5.2	0.494
Indicator 17.7.1	0.677
Indicator 17.7.2	0.732
Indicator 18.5.1	0.810
Indicator 18.5.2	0.854
Indicator 18.5.3	0.800
Indicator 18.5.4	0.847
Indicator 18.7.1	0.905
Indicator 18.7.2	0.812
Indicator 24.7.4	0.516
Indicator 25.5.4	0.469
Indicator 29.5.3	0.505
Indicator 29.7.1	0.544
Indicator 29.7.2	0.691
Indicator 30.5.1	0.652
Indicator 30.5.2	0.758
Indicator 30.7.1	0.862
Indicator 30.7.2	0.862
Indicator 31.7.1	0.778
Indicator 31.7.2	0.492
Indicator 32.3.1	0.834
Indicator 32.3.2	0.776
Indicator 32.5.1	0.643
Indicator 32.5.2	0.826
Indicator 32.5.3	0.770
Indicator 32.7.1	0.740
Indicator 32.7.2	0.821
Indicator 33.5.2	0.834
Indicator 33.7.1	0.649
Indicator 33.7.2	0.459
Indicator 34.7.2	0.620
Indicator 35.7.1	0.803
Indicator 36.5.1	0.446
Indicator 36.7.2	0.734

Note: Standardised factor loadings are reported. Variable name refers to indicator number, quality level and question number.