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Examining the longitudinal association between toddlers' early shyness and their well-being during their first year in Norwegian early childhood education and care

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ABSTRACT

Using a multilevel random-coefficient approach, we examined the longitudinal association between toddlers' early shyness and their well-being during their first year in Norwegian early childhood education and care (ECEC) centres. We used data from two measurement points (preintervention and postintervention) from a larger cluster randomized controlled trial study, Thrive by 3. We followed 567 children (answered by 415 mothers and 152 fathers) who were younger than 19 months and had just started in ECEC at preintervention. Our findings indicate that toddlers' early shyness during their starting period in ECEC is associated with their well-being by the end of their first year in ECEC. Our findings highlight the importance of paying extra attention to shy toddlers, as they seem to show less well-being during their early period in ECEC.

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Early shyness; well-being; longitudinal; ECEC; Norway; toddlers

Introduction

An increasing number of toddlers are spending considerable time in early childhood education and care (ECEC; Council of the European Union, 2019). In Norway, where we conducted the current study, 87.7% of 1–2-year-old children attend an ECEC centre, and most of these children (97.2%) spend 41 hr or more in a centre per week (Statistics Norway, 2023). Attending ECEC for the first time might be unsettling for young children, as they are separated from their parents and must adapt to a new care environment (Council of the European Union, 2019; Ereky-Stevens, Funder, Katschnig, Malmberg, & Datler, 2018). Earlier studies have shown that a good transition from home to ECEC is important for children's current and later well-being and development in ECEC (Brooker, 2008; O'Connor, 2017). Children can react differently to this transition based on their temperament that provides information about how a child approaches and reacts to its environment (Nigg, 2006). The transition from home to ECEC might be extra challenging for shy children (Coplan & Arbeau, 2008). Shyness

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is a temperamental trait and characterized by expressing, for example, wariness, anxiety, and reticence in (novel) social situations (e.g. Buss & Plomin, 2014). Therefore, shy children can be more wary when they are attending ECEC for the first time (Coplan & Arbeau, 2008). However, we know little about toddlers' temperamental traits such as shyness and how this is associated with their well-being during their starting period in ECEC.

Toddlers' social – emotional well-being in ECEC

Special interest in toddlers' social – emotional well-being (hereafter called 'well-being') in ECEC is needed because the ECEC context is, along with the home environment, one of the immediate environments that has a direct influence on children's development (i.e. microsystem; Bronfenbrenner, 1979). The well-being of a child in ECEC can be defined as the degree to which the child feels comfortable with the professional caregiver(s), peers, and within the physical setting of the centre (De Schipper, Van IJzendoorn, & Tavecchio, 2004), and is therefore different from the child's well-being at home. Earlier studies have shown that children who express a strong sense of well-being in ECEC are often more confident and positive to explore and interact with their environment (Department for Education and Child Development, 2016; La Paro & Gloeckler, 2016). The importance of children's well-being for their current and later development and learning seems undisputed (Mashford-Scott, Church, & Tayler, 2012).

Shyness

Shyness is a temperamental trait that can be defined as wariness, anxiety, and reticence in (novel) social situations as well as self-consciousness or embarrassment in response to perceived social evaluation (Buss & Plomin, 2014; Coplan, Prakash, O'Neil, & Armer, 2004; Rubin, Coplan, & Bowker, 2009). As with other temperamental traits, shyness provides information about how children approach and react to their environment (Nigg, 2006). It is a product of complex interactions between genetic, biological, and environmental factors (Shiner et al., 2012). Shyness might be expressed by the lack of social interaction in the presence of peers. The reason that a shy child tends to withdraw from social interactions is that the child experiences fear or wariness, even if the child might have the desire to join others (e.g. Asendorpf, 1990; Coplan et al., 2004; Rubin & Coplan, 2004). Based on behavioural expressions, shyness is sometimes referred to as unsociability. However, shyness refers to how a child behaves in social situations with strangers or casual acquaintances. When shy children are with people they know well, they often do not experience feelings of distress or the need to escape (Buss, 1991; Buss & Plomin, 2014). Shy children often need more time to adapt to a new environment than their non-shy peers (Buss & Plomin, 2014; Coplan et al., 2004; Rubin et al., 2009). Fear of strangers is part of normative development and decreases over time. Children have internal coping mechanisms when encountering (novel) situations. However, if learning to cope with social stresses takes too long, it can lead to social anxiety (e.g. the child will not like being with people they do not know well; Buss, 1986) and other social – emotional and psychological difficulties, such as depression and poorer social skills (e.g. Abulizi, Pryor, Michel, Melchior, & Van der Waerden, 2017; Booth-LaForce & Oxford, 2008).

Being shy in ECEC

The transition from the home environment to the ECEC environment might be particularly challenging for shy children, as they have to cope with the stresses of the group environment (i.e. new professional caregivers, peers, and physical environment of the centre; e.g. Coplan & Arbeau, 2008; Kalutskaya, Archbell, Moritz Rudasill, & Coplan, 2015). Norwegian ECEC centres focus extensively on providing an environment in which children have opportunities to play and form friendships, which are essential for children's well-being, development, and learning (Norwegian Directorate

for Education and Training, 2017). However, shy children can be at risk for missing out on early play experiences with peers because with their feelings of anxiety and fear, they often end up as ‘onlookers’ on other children’s group play (Coplan, Arbeau, & Armer, 2008; Jones, Schulkin, & Schmidt, 2014). This tendency regularly results in them playing alone and trying to avoid social interactions even though some of these children have a desire to interact with others in ECEC settings (Asendorpf, 1990; Gazelle & Ladd, 2003; Rubin et al., 2009). A positive and close relationship with the professional caregivers might help shy children feel less lonely and reduce peer rejection and internalizing problems (Arbeau, Coplan, & Weeks, 2010; Baardstu, Coplan, Eliassen, Brandlistuen, & Wang, 2022). However, studies have also shown that shy children generally have less close staff – child relationships (Rudasill, Rimm-Kaufman, Justice, & Pence, 2006; Rydell, Bohlin, & Thorell, 2005; Wu et al., 2015). Moreover, studies have shown that high process quality at the group level (i.e. proximal daily experiences in ECEC, such as affectionate and responsive staff – child interactions and positive peer interactions) might not support all children, as individual children can experience the provided quality differently than their peers (Melhuish et al., 2015; Phillips, Crowell, & Sussman, 2012). In addition, shyness and the way children play with peers develop as children age. Infants express shyness mainly through great fearfulness and low sociability whereas self-consciousness begins at the age of 4–5 years (Buss & Plomin, 2014). Moreover, verbal interactions with peers become more important over time, and increased verbal skills can be beneficial for shy children (e.g. Asendorpf, 1994; Coplan & Armer, 2005; Evans, 1996). A study of Evans (1996) on children who were followed from ECEC to their first grade in school showed that professional caregivers supporting children to become active and responsible group participants can help shy children to become more verbal. However, children who are shy can be restricted by their anxiety, which can result in less verbal participation with peers (Evans, 1996). Therefore, professional caregivers must provide multiple types of support depending on the child’s needs and developmental age (e.g. Asendorpf, 1994; Coplan & Armer, 2005; Rimm-Kaufman et al., 2002). Meeting the needs of the youngest shy children is more challenging for professional caregivers, as toddlers have more difficulty expressing themselves (Eide, Winger, Danielsen Wolf, & Fehn Dahle, 2017). Therefore, toddlers are more dependent on the professional caregivers’ observations (Moser, Broekhuizen, Leseman, & Melhuish, 2017), and research on the role of early shyness on toddlers’ well-being is needed to provide insight into how shy children are doing during their first year in ECEC. Work focused on the association between children’s shyness and well-being in ECEC is forthcoming (Van Trijp et al., 2021), but research on the longitudinal association between toddlers’ early shyness and well-being during their first year in ECEC is lacking.

Longitudinal association between early shyness and well-being in ECEC

Earlier studies on the predictor effect of early shyness mainly focused on older children in ECEC or on following children for multiple years in various contexts, such as ECEC and school (e.g. Abulizi et al., 2017; Bekkhus et al., 2022; Biederman et al., 2001; Booth-LaForce & Oxford, 2008; Bould et al., 2014; Karevold, Røysamb, Ystrom, & Mathiesen, 2009; Karevold, Ystrom, Coplan, Sanson, & Mathiesen, 2012; Prior, Smart, Sanson, & Oberklaid, 2000). Some of these studies have shown that shyness during early childhood seems to be a predictor for later psychological and social – emotional difficulties. Children who were more shy during their first years in life showed higher levels of depression, anxiety, and emotional problems; poorer social skills (e.g. Abulizi et al., 2017; Biederman et al., 2001; Karevold et al., 2009; Karevold et al., 2012; Prior et al., 2000); but also decreased behavioural withdrawal (Booth-LaForce & Oxford, 2008) during childhood or adolescence. Bekkhus et al. (2022), on the other hand, did not find a clear predictor effect of early shyness on later social – emotional difficulties for 4–7-year-old children attending ECEC and elementary school, and neither did Bould et al. (2014) when they examined the association between 6-year-olds’ shyness and depression at the age of 18 years. These studies mainly focused on negative emotions and behaviours as outcomes (Stifter, Augustine, & Dollar, 2020). However, more research is needed on younger children and their level of enjoyment and feeling

of comfort during various daily situations, in social situations, and within the physical environment of the ECEC centre. The youngest children are of specific interest because, as previously outlined, 87.7% of 1–2-year-old children in Norway make the transition from the home environment to an ECEC centre and spend a considerable time there (Statistics Norway, 2023).

Some developmental processes that occur over time might explain the mixed findings across studies on the predictor effect of early shyness on later psychological and social – emotional difficulties. A study on elementary school children who were shy during preschool suggested that shy children might show less social withdrawal over time as they gain more experience in interacting with peers, thereby improving their confidence and social skills (Booth-LaForce & Oxford, 2008). In addition, there are signs that younger shy children also develop emotion-related skills (e.g. recognizing causes of emotions) and use adaptive emotion regulation strategies (e.g. problem solving and seeking social support) to cope with social stresses and promote positive interactions with peers and professional caregivers (Coplan, Baldwin, & Wood, 2020). Similar results can be found regarding the youngest children in ECEC who had just started in ECEC, as Chess and Thomas (1984) introduced the temperamental classification of ‘slow to warm up’ infants. These children show mild intense negative responses to new stimuli but adapt slowly after repetitive exposure, showing interest and positive responses. Therefore, potential negative associations between toddlers’ early shyness and well-being in ECEC might weaken over time. However, this effect might not occur during the first year in ECEC, as not only the transition from the home environment to the ECEC environment but also the first full year in ECEC can be challenging.

The present study

We examined whether toddlers’ early shyness predicts their well-being during their first year in Norwegian ECEC (centre-based day care). We followed a multilevel random coefficient modelling approach to examine the following research question: ‘Is there an association between toddlers’ early shyness during the starting period in ECEC and their well-being by the end of their first year in the centre?’ Based on previous studies (e.g. Abulizi et al., 2017; Chess & Thomas, 1984), we expect to find that toddlers’ early shyness when they first enter ECEC predicts their well-being negatively by the end of their first year in ECEC.

Method

Procedures

The present study is part of the larger Thrive by 3 (Trygg før 3) study, which is a cluster randomized controlled trial regarding a 10-month multicomponent, in-service professional development intervention that was developed to promote the quality of staff-child interactions (i.e. process quality), and to strengthen 1 – to 3-year-old children’s well-being, mental health, and development in Norwegian ECEC centres (Lekhal, Drugli, Berg-Nielsen, & Solheim Buøen, 2020; Solheim Buøen, Lekhal, Lydersen, Berg-Nielsen, & Drugli, 2021). The Regional Committees for Medical and Health Research Ethics South East Norway and the Norwegian Centre for Research Data approved the study. The data for this study was derived from the preintervention (September 2018) and postintervention (June/July 2019) data collection rounds in the larger Thrive by 3 study.

In total seven municipalities/city districts, four in Eastern Norway and three in Central Norway, were invited and consented to participate in the study. The electronic link to the written consent form was sent by e-mail (or letter, if needed) to the ECEC centres’ managers to determine the centre’s and their own participation. After consenting to the centre’s participation, the managers forwarded, on behalf of the Thrive by 3 study, the email with the written informed consent form to all professional caregivers, parents, and children at the centre. A total of 187 units/groups in 78 ECEC centres agreed to participate. Every unit/group had a staff-child ratio of at least one professional

caregiver working with three children. The written consent for the child was only valid when both parents agreed on their child's participation. A written consent was provided for a total of 1,561 children (800 boys, 761 girls) age 8–34 months ($M = 21.4$ months, $SD = 6.2$), who were part of 185 units/groups, and 733 of the children (and 86 units/groups) were part of the intervention group.

Participants

In Norway, most children attend an ECEC centre for the first time around the age of 12 months because all children are entitled to a place in public subsidized ECEC centres at this age (The Kindergarten Act, 2005). In the current study, we focused on children new to the ECEC setting and therefore included only children younger than 19 months at preintervention. Note that of the 580 children for whom we had written consent at preintervention, we excluded 13 children because they quit the ECEC centre or moved to another unit/group during their first year in ECEC. This exclusion resulted in 567 available children (288 boys, 279 girls from 163 toddler units/groups, $M = 14.6$ months, $SD = 2.2$) in the current study. The professional caregiver who knew the child best filled out an electronic questionnaire regarding the child's well-being in ECEC during postintervention whereas we used electronic questionnaire data from one parent (415 mothers and 152 fathers) to study child and family characteristics and the child's shyness at preintervention. Most children attended the ECEC centre fulltime (6 hr or more per day), had Norwegian as their native language, and came from high-income families, as Table 1 shows.

Measures

Shyness

We examined children's shyness using parents' answers on the shyness subscale of the Emotionality Activity Sociability Temperament Survey for Children (EAS; Buss & Plomin, 2014) at preintervention. The shyness subscale consisted of five items assessing whether the child becomes shy easily, easily makes friends, is very sociable, takes a long time to feel comfortable with strangers, and trusts

Table 1. Descriptives: pre-intervention child and family characteristics, child's shyness, and post-intervention well-being.

	%/M	SD	n	n missing	Cronbach's alpha
Intervention group (72 units/groups)	45.7%		259		
Control group (91 units/groups)	54.3%		308		
Gender			567	0	
Boys	50.8%		288		
Girls	49.2%		279		
Age in months	14.6	2.21	567	0	
Months in ECEC	1.07	1.33	531	36	
Language			500	67	
Norwegian	92%		460		
Minority language	8%		40		
Hours per day in ECEC			494	73	
Less than 6 hr	5.5%		27		
6–8 hr	82.2%		406		
More than 8 hr	12.3%		61		
Family gross income			495	72	
Under 200,000 Norwegian kroner (NOK)	0.8%		4		
200,000–399,000 NOK	3.2%		16		
400,000–599,000 NOK	6.7%		33		
600,000–799,000 NOK	13.9%		69		
800,000–999,000 NOK	24.6%		122		
Over 1,000,000 NOK	50.7%		251		
Shyness	2.41	.64	483	84	.75
Well-being	4.54	.38	547	20	.79

Note. Internal consistency based on Cronbach's alpha (α): $\alpha < .50$ unacceptable; $.50 \leq \alpha < .60$ poor; $.60 \leq \alpha < .70$ acceptable; $.70 \leq \alpha < .90$ good; $\alpha \geq .90$ excellent.

strangers very easily. The parents answered these items on a 5-point Likert scale ranging from 1 (*very typical*) to 5 (*not at all typical*). A high score on the shyness subscale indicated that the child was shy. [Table 1](#) presents this scale's descriptors. The shyness subscale showed a good internal consistency with a Cronbach's alpha of 0.75.

Well-being in ECEC

Well-being in ECEC was measured by using the Leiden Inventory for the Child's Well-being in Day care (LICW-D; De Schipper et al., 2004), filled out by the professional caregiver who knew the child best during postintervention. This questionnaire has been validated in Norway in an earlier study using data from Thrive by 3 (Van Trijp, Lekhal, Drugli, Rydland, & Solheim Buøen, 2021). It consisted of 12 items that can be answered on a 5-point Likert scale ranging from 1 (*never*) to 5 (*always*). The items assessed the child's general well-being (e.g. child enjoys attending the day care centre), how comfortable the child is with peers (e.g. child trusts all the children at the day care centre), how comfortable the child is with the professional caregiver(s) (e.g. child is happy to see the professional caregiver(s) when he/she is dropped off), and comfortability with the physical setting of the centre (e.g. child really enjoys the games and play material at the day care centre). A higher score indicates a higher level of well-being. [Table 1](#) shows this scale's descriptors. The LICW-D showed a good internal consistency with a Cronbach's alpha of 0.79.

Child and family characteristics

To study the association between toddlers' early shyness and well-being by the end of their first year in ECEC, we controlled for the following preintervention child characteristics, which the parent reported: child's gender (0 = boy, 1 = girl), child's age in months, whether the child has a Norwegian or other linguistic background (1 = Norwegian, 2 = minority language from a Western country in Europe or North America, 3 = minority language from a non-Western country), and the number of hours in the ECEC centre per day (1 = less than 6 hr, 2 = 6 hr, 3 = 6–8 hr, and 4 = more than 8 hr). For subsequent analyses, we computed the answers for linguistic background (0 = Norwegian, 1 = minority language) and the number of hours in the ECEC centre (1 = less than 6 hr, 2 = 6–8 hr, 3 = more than 8 hr). We treated the child's gender and linguistic background as dummy variables.

We also controlled for family's preintervention gross income, which the parent reported (1 = under 200,000, 2 = 200,000–399,000, 3 = 400,000–599,000, 4 = 600,000–799,000, 5 = 800,000–999,000, and 6 = over 1,000,000 [in Norwegian kroner]). [Table 1](#) presents the descriptors.

Analyses

Because the children are situated in units/groups, we first investigated the intraclass correlation coefficient (ICC) to determine to what extent the child measures are nested. The within – and between group variance components for children's well-being were tested by examining the ICC on the individual mean scores from the whole LICW-D scale (i.e. these scores are not centred). The ICC indicated that 22.9% of the variance in children's well-being at postintervention could be explained by the variance between groups. Because the suggested 5% threshold was exceeded (Hox, Moerbeek, & Van de Schoot, 2017; Raudenbush & Liu, 2000), we deemed multilevel analyses most appropriate.

Multilevel random coefficient modelling with the maximum likelihood with robust standard errors (MLR) estimator in Mplus Version 8 (Muthén & Muthén, 2017) was used to study the within-level effect of children's early shyness on their well-being by the end of their first year in ECEC. Both the dependent variable (i.e. children's well-being) and independent variable (i.e. child's shyness) were level 1 variables (child level). For multilevel analyses, the independent variable and covariates need to be group mean (i.e. child's score compared to the unit/group), or grand mean centred (i.e. child's score compared to the whole sample) (e.g. Finch & Bolin, 2017; Heck & Thomas, 2015). The covariates (i.e. child's age in months, number of hours in the ECEC centre per

Table 2. Correlations between intervention/control group, child and family characteristics, shyness, and well-being variables.

Variables	1	2	3	4	5	6	7	8
1 Intervention/Control group	–							
2 Gender	–.02	–						
3 Age in months	<.01	<.01	–					
4 Language	–.02	–.06	.06	–				
5 Time per day in ECEC	–.04	–.01	.14**	–.03	–			
6 Family's gross income	–.05	.04	–.07	–.28***	.05	–		
7 Shyness	.02	.02	.08	.08	–.05	–.07	–	
8 Well-being	–.06	.04	–.02	–.08	.02	.03	–.14**	–

Note. ** $p < .01$, *** $p < .001$ (two-tailed).

day, and family's gross income) were grand mean centred, whereas children's shyness was group mean centred. The choice to group mean centre children's shyness is based on earlier studies that showed that children's shyness can be affected by the unit/group wherein they participate (e.g. Gazelle, 2006; Rubin, Wojslawowicz, Rose-Krasnor, LaForce, & Burgess, 2006, 2009; Shiner et al., 2012). In addition to person-mean centring the above-mentioned variables at the child level, we followed the recommendation of Preacher, Zhang, and Zyphur (2016) to control for the between-level effect of the unit/group by aggregating the mean score of the unit/group wherein the child participates.

We wanted to analyse uncontrolled and controlled models to examine the relationship's strength between children's early shyness and their well-being by the end of their first year in the centre. This procedure resulted in three models. Model 1 was uncontrolled, and Model 2 was controlled for child and family characteristics at the within level, and shyness at the between level. Because we drew the sample from a randomized controlled trial, we tested Model 3, in which well-being was regressed on the interaction term of shyness and the intervention in addition to the main effects of shyness (group-mean centred) and the intervention (dummy: 0 = control, 1 = intervention), and we controlled for the same variables as in Model 2. Table 2 shows an overview of the correlations between these variables at the within-level. We also examined the models' fit to determine whether the model improved after we controlled for additional variables. We used the Akaike information criterion (AIC) and Bayesian information criterion (BIC) to explore the model fit. The model fit was better if the new model had lower values for AIC and BIC compared to the former model (Finch & Bolin, 2017). The Chi-square is highly sensitive to sample size, and a highly satisfactory model can be rejected due to discrepancies (Brown, 2015). Therefore, this statistic should be interpreted with caution when examining the model fit. In addition, we defined the model fit as good if CFI > .95, TLI > .95, RMSEA ≤ .05, and SRMR ≤ .05, and we defined it as acceptable if CFI and TLI fell between .90 and .95, RMSEA fell between .06 and .10, and SRMR fell between .06 and .08 (e.g. Hu & Bentler, 1999; MacCallum, Browne, & Sugawara, 1996).

Results

Non-response

Collecting data from multiple respondents with different questionnaires during multiple data collection rounds resulted in missing at random (MAR) (Rubin, 1976). We tested the missing patterns using IBM SPSS Statistics Version 28.0 (IBM Corp, 2021) and found that 467 children (82.4% of 567 children) had complete data on all variables during the two data collection rounds. The missing patterns were mainly found at preintervention and were caused by missing values on the shyness scale (14.8%) and/or child and family characteristics variables (11.8%–12.9%) because the parent did not fill out the questionnaire for the child. Whereas 3.5% of the data was missing due to that the LICW-D was not filled out at postintervention. An overview of the number of missing cases is presented in Table 1. MLR was used as an estimation method to cope with the missing values. Therefore, the data was not imputed.

Table 3. Multilevel random coefficient modelling results and fit indices for children's early shyness on well-being by the end of their first year in ECEC.

	<i>N</i>	Units/groups	Estimate (<i>SE</i>)	χ^2 (<i>df</i>)	AIC	BIC
<i>Shyness – Well-being</i>						
Model 0	547	162	4.54*** (.02)		474.64	487.55
Intercept						
Model 1	468	158	-.06* (.03)	11.679** (2)	410.31	431.05
Intercept			4.89*** (.013)			
Model 2	467	158	-.06* (.03)	11.907 (7)	418.90	460.36
Intercept			4.88*** (.013)			

Note. *SE* = standard error; AIC = Akaike information criterion; BIC = Bayesian information criterion. * $p < .05$, ** $p < .01$, *** $p < .001$ (two-tailed). Model 0 is the intercept-only model. Model 1 was uncontrolled at within-level and controlled for shyness at between-level. Model 2 was controlled for child and family characteristics at within-level and shyness at between-level.

Early shyness and well-being by the end of the ECEC year

The results concerning the association between children's early shyness and well-being by the end of their first year in ECEC are presented in Tables 3 and 4. A significant negative relationship was found for models 1 and 2 on children's early shyness at preintervention and well-being in ECEC at postintervention. Children who were more shy in the beginning of their period in ECEC showed a lower level of well-being by the end of their first year in ECEC. Note that the effect size of early shyness on well-being was small. No significant interaction effect was found on well-being ($p > .05$) in Model 3, suggesting that the results were not affected by any intervention effect.

In addition, we examined the model fit and found a good fit for all models (CFI = 1.00, TLI = 1.00, RMSEA = 0, SRMR = 0). The model fits for the AIC and BIC, which improved after we included the predictor in Model 1, are presented in Table 3. However, the AIC and BIC in Model 2 became slightly worse when we studied the association between early shyness and well-being at postintervention by controlling for child and family characteristics.

We further examined models 1 and 2 for boys and girls separately. No significant differences were found between these groups ($p > .05$).

Discussion

To our knowledge, this study is the first focusing on the longitudinal association between toddlers' early shyness and well-being during their first year in ECEC. Our findings confirmed our hypothesis and showed that toddlers who were shy during their starting period showed less well-being by the end of their first year in ECEC. Earlier studies showed that a longitudinal association between shyness during early childhood can predict later psychological and social-emotional difficulties (e.g. Abulizi et al., 2017; Biederman et al., 2001; Karevold et al., 2009; Karevold et al., 2012; Prior et al., 2000). The

Table 4. Multilevel random coefficient modelling results for children's early shyness and covariates on well-being by the end of their first year in ECEC.

	Well-being	
	Model 1 Estimate (<i>SE</i>)	Model 2 Estimate (<i>SE</i>)
<i>Within level</i>		
Shyness	-.06* (.03)	-.06* (.03)
Gender		.01 (.03)
Age in months		< -.01 (.01)
Language		-.08 (.09)
Time per day in ECEC		-.01 (.04)
Family's gross income		-.01 (.02)
<i>Between level</i>		
Shyness	-.15* (.06)	-.14* (.06)

Note. *SE* = standard error. * $p < .05$ (two-tailed).

current study confirmed that the longitudinal association between early shyness and well-being is already present for children under the age of 2 years who have recently started in ECEC. Not only the transition from the home environment to the ECEC environment may be challenging for shy toddlers, but also their first year in ECEC.

There might be multiple explanations for the negative association that we found between early shyness and well-being in ECEC, and what can be helpful for shy toddlers when they start in ECEC. Toddlers in general are more susceptible to what is happening in their environment (Blakemore & Frith, 2005), and fear of strangers is part of normative development and decreases over time (Buss, 1986). However, shy toddlers may need more time to adapt to the new stresses of the group environment in ECEC compared to their non-shy peers (e.g. Coplan & Arbeau, 2008; Kalutskaya et al., 2015). In Norwegian ECEC, there is a large focus on play and friendship (Norwegian Directorate for Education and Training, 2017). However, shy children's wariness and anxiety can prevent them from playing with peers, which reduces the possibility of developing social skills and being assertive (Coplan et al., 2008; Jones et al., 2014). Even though we did not study peer interactions, it might be that the lack of these social experiences can extend the time that shy toddlers need to adapt to the ECEC environment and can put them at risk of experiencing lower levels of well-being over a longer period. However, it could also be that shy toddlers have a 'slow to warm up' temperament, which means that they can show mildly intense negative responses to new stimuli but adapt slowly after repetitive exposure by showing interest and positive responses (Chess & Thomas, 1984). In addition, based on earlier studies, we speculate that shy children might need more support from professional caregivers during social interactions with peers to be able to cope with new stimuli and develop social skills. Support might be needed especially when approaching other children for play activities, as 2-year-olds express shyness mainly by high fearfulness and low sociability (Buss & Plomin, 2014). As the study of Evans (1996) showed that teacher support can be helpful for shy children to become more verbal and active in peer group activities, but they can also be restricted by their anxiety which can result in less verbal participation. This underlines the need for understanding how shy children adjust to peer group settings for their ability to develop pre-academic skills, and that attention should be paid to shy children's individual needs and developmental age (e.g. Asendorpf, 1994; Coplan & Armer, 2005; Evans, 1996; Rimm-Kaufman et al., 2002).

Our findings also showed that the longitudinal association between toddlers' early shyness and well-being at the end of the first year was small. Several explanations might be possible for these findings as well. It could be, as Bekkhus et al. (2022) suggest, that early shyness is especially a risk factor when combined with other risk factors. In the current study, most children scored high to very high on well-being in ECEC, which makes it more difficult to study potential explanations for lower levels of well-being. Even though we did not study process quality, an explanation might be that the children were participating in groups with high process quality, which might serve as a protective factor for the association between early shyness and later well-being. Earlier studies found that the unit/group wherein the child participates might affect how shy children are doing in the ECEC centre. Multiple studies on school-aged children have shown that shy children are especially at risk for adjustment difficulties when they participate in a group with negative emotional climates (i.e. conflicts between peers and/or staff-children, and peer exclusion) (e.g. Gazelle, 2006; Gazelle & Ladd, 2003). Whereas high-quality friendships might help shy children to thrive in the unit/group (Rubin et al., 2006). However, shy children often have close relationships with other shy children, which can be less supportive and intimate (Burgess, Wojslawowicz, Rubin, Rose-Krasnor, & LaForce, 2006; Rubin et al., 2009). Therefore, children's shyness and how they react to their peers and professional caregivers might be affected by the unit/group wherein they participate. Nevertheless, we still found an association with well-being at postintervention meaning that early shyness can challenge toddlers to thrive during their first year in ECEC.

A considerable strength of this study is that we had a large sample of children. In addition, we collected multiple informant questionnaire data from professional caregivers and parents. The professional caregivers had the best overview of the child's well-being in ECEC whereas the parent had

the best overview of the child's shyness. However, some limitations should be mentioned as well. One limitation might be that the children scored high to very high on well-being in ECEC, which makes it challenging to examine explanations for children's lower levels of well-being. Another limitation is that our sample consisted of mainly ethnic Norwegian children from high-income families. Children with a minority language background and children from families with lower incomes were underrepresented. It could be that these groups of children face more challenges in terms of their well-being in ECEC, especially when they are shy (Le Pichon & De Jonge, 2016). This could result in more (social) stress, and the association between their early shyness and well-being by the end of the first ECEC year might have been stronger. Although the study sample was relatively homogenous in terms of income and language background, we still found a longitudinal association between early shyness and well-being in ECEC. Another limitation could be the answer categories for the control variable 'the child's number of hours in the ECEC per day.' Most children spend 6 hr per day in ECEC. Therefore, we wanted to have '6 hr' as a separate answer category. The other answer categories were developed around this number. However, we did overlook that the parent could answer both the category of 6 hr and 6–8 hr when their child attends the centre 6 hr per day. Therefore, we computed the answer categories for our subsequent analyses, which resulted in fewer categories with large ranges. This probably did not affect our results as most of the children were attending the centre fulltime. However, answer categories with smaller ranges would have provided us with more detailed information about the number of hours that the child spends in the ECEC centre.

Despite the aforementioned limitations, our findings indicate that extra attention should be paid to shy toddlers as soon as they start in ECEC to prevent lower levels of well-being during their first year. Children's first year in ECEC might be challenging for the professional caregivers as well because they need to become familiar with the child's needs. In the context of the Norwegian ECEC, we see that there is a need to include topics such as toddlers' development and learning and how to support them by departing from the child's own perspectives in the educational curriculum of professional caregivers (Solheim Buøen et al., 2021).

Future research should follow the children over a longer period to see how toddlers' early shyness at the start in ECEC might still affect their well-being after spending a few years in ECEC. In addition, children with a minority language background and from families with lower incomes should be examined to see if similar results are found. Finally, the effect of interpersonal staff-child interactions as well as the peer interactions of shy toddlers can be studied as a potential mediator or moderator on the association between toddlers' early shyness and well-being during the first year in ECEC. Since high ECEC process quality at the group level might not support all children, more insight is needed into how caregivers can best support shy toddlers' individual needs and their interpersonal social interactions.

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