A SIMPLE REORGANIZATION OF CHILDCARE CENTRE WITH POSITIVE EFFECTS ON SELF REGULATION AND PLAY BEHAVIOUR

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ABSTRACT

In the present study, we used a cuasi-experimental design to evaluate the impact of changing the organization of preschool centres in children's self regulation and socio-emotional development. The changes included giving the children the opportunity to choose activities, the conformation of multi-aged groups during part of the day, and promoting a higher commitment of educators to specific aspects of the curriculum. Our results show that children in the intervention group display improved self-regulation, particularly in a decrease in negative affectivity, conduct problems and emotional symptoms. Additionally, they showed increase complexity in their play behaviours and more peer-interactions in social play. The intervention proved to be a low-cost, easy to implement alternative with promising results in a country with restricted financial resources in education.

Keywords Early childhood · Childcare Setting · Self regulation

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1 Background

1.1 Self-regulation and play

Early childhood is a crucial period in child development. Children's experiences throughout this stage in development have been linked to impacts in both health and academic outcomes into adulthood (Walker et al., 2011; Nelson et al., 2020). Developmental outcomes have been associated to both individual differences and environmental factors such as nutrition, responsive parenting, home stimulation and childcare quality (Anderson et al., 2003; Li et al., 2013; Britto et al., 2017; Maitre et al., 2021).

Self regulation is a broad concept that encompasses aspects of emotional regulation and cognitive and behavioural control (Nigg, 2017) and allows children to control and coordinate their actions towards accomplishing goals, following rules, or adjusting to social norms (Vohs and Baumeister, 2016). Self regulation grants children increased autonomy and sets the early basis for later academic and health outcomes (Calkins, 2007; Moffitt et al., 2011).

Several research traditions in psychology and cognitive neuroscience contribute to our understanding of the development of self regulation. Temperament is a psychological construct which has been defined as the difference in emotional and behavioural dispositions across individuals (Rothbart et al., 2011). Constructs from the temperament literature such as negative affect and effortful control have been related to the development of self regulation during early childhood (Rothbart et al., 2006; Posner and Rothbart, 2000; Eisenberg et al., 2004; Miner and Clarke-Stewart, 2008). In this sense, temperament is theorized as one of the pillars from which self regulated behaviour and emotion stems from (Rueda et al., 2005). Negative affect is characterized by the presence of emotions such as fear, anger and discomfort during new or stressing situations, while effortful control has been related to aspects such as inhibitory control, attentional control and soothability (Putnam et al., 2008). Recent evidence suggests there's an association between lower negative affect and better effortful control and children's performance during tasks that require self regulation (Song et al., 2018). Raikes et al. (2007) studied over two thousand children between 14 and 36 months and found associations between children with high negative emotion and lower self regulation at 36 months old. Some authors (Lin et al., 2019; Liew, 2012) have argued that differencing between effortful control and executive functioning during early childhood is a matter of tradition across different disciplines, given that both processes refer to top-down processes and the inhibition of dominant responses, as well as sharing neurological substrates within the prefrontal cortex (Moriguchi and Hiraki, 2013). The current paper's conceptualization of these terms is in line with Nigg (2017), who based on an extensive literature review points out that, while there is a general lack of consensus regarding this matter, effortful control is considered a trait-level precursor of cognitive control, which is in turn encompassed by the umbrella term of executive functioning (Rothbart et al., 2006; Blair and Razza, 2007; Posner et al., 2014).

Play provides children with opportunities to develop and train various cognitive aspects such as sustained attention, memory, problem solving, as well as socioemotional aspects like cooperation, prosocial behaviour, emotional self regulation, among others (LaFreniere, 2013; Hirsh-Pasek et al., 2009). Play is especially relevant to this research considering evidence that suggests the ability to engage in cooperative behaviour starts to develop between 2 and 3 years old (Brownell et al., 2006) and social play has been identified as a precursor to adult social competence (Palagi, 2018). On the other hand, solitary play (in both its functional and pretend play kind) on preschoolers has been previously associated with aspects of socioemotional development such as lower peer-acceptance and social maladjustment (Nelson et al., 2008). Free play observation, therefore, provides valuable ecological information on children's cognitive and social development. Rubin 1976 proposed a classification of children's free-play behaviour in both cognitive and social forms using theoretical frameworks from Parten (1932) and Smilansky (1968). Cognitive play has been hierarchized in the following form: functional play (often characterized by repetitive motor actions in order to accomplish physical enjoyment), constructive play (object manipulation for construction such as play dough or bricks), dramatic play (pretend-play) and games with rules. Social play categories consist of solitary play, parallel play (children who play physically near peers but do not engage in joint activities) and group play, which has been divided into associative play and cooperative play (Rubin et al., 1976).

1.2 Effects of early care environment on development

It has been pointed out that the elevated neuroplasticity during early childhood opens a window of opportunity for the implementation of effective interventions capable of boosting development (Shonkoff et al., 2000). However, it could also lead to higher vulnerability to harmful, stressful or less than stimulating conditions (Lipina and Segretin, 2015; Wray et al., 2017).

The effects of childhood poverty on developmental outcomes have been thoroughly documented and it has been linked with both short (Hermida et al., 2015; Hackman et al., 2010) and long term consequences (Yoshikawa et al., 2012). Low socioeconomic status (SES) has been linked to greater health risks, decreased performance in cognitive tasks, higher impulsivity and a higher prevalence of behavioural problems (Bradley and Corwyn, 2002; Brooks-Gunn and Duncan, 1997). Several studies have highlighted the cost-effectiveness of investing in early childhood policies as a prevention

system to poverty's long term consequences (Barnett, 1993), therefore, it is of utter importance that evidence-based practices are implemented and that ongoing practices are submitted to evaluation in order to ensure the greatest benefits for both children and countries alike. Childcare and preschool programmes have been identified as a protective factor capable of buffering the harmful effects of growing up in poverty (Berry et al., 2016; Pianta et al., 2009; Mashburn et al., 2008; Caughy et al., 1994).

1.3 Child-care quality and organization

In light of this evidence, many policy makers have strived towards the universalization of preschool (Dietrichson et al., 2020; Gamboa and Krüger, 2016). However, ensuring quality is highly important for the success of these programmes. Quality childcare has been linked to benefits in cognitive and socioemotional development as well as better math and literacy skills (Network, 2002; Vandell et al., 2000; Huntsman, 2008). These benefits seem to be even more significant for children whose abilities have already suffered the consequences of a poor environment (of Child Health et al., 2003). Plan CAIF (Centres for attention of infants and family) is a state-funded Uruguayan programme which provides early childhood education and childcare for children 0 to 3 years old, mostly from disadvantaged homes (Gil and Cambón, 2014; UNICEF et al., 2013). A study performed in 2012 by authorities of Plan CAIF in collaboration with a private consultancy service (Mori, 2011) identified in a sample of over a thousand children attending Plan CAIF that 15% of their households reported 2 or more unfulfilled basic needs, as opposed to the 5% of households reported on a national scale at the time. Plan CAIF reaches over 50 thousand uruguayan children through 411 early childhood centres (INAU, 2017). Each centre is run by a civil society organization (CSOs) and is state supervised through INAU (Uruguay's Institute for Childhood and Adolescence). CSOs are often formed by non-profit organizations, religious groups, neighbourhood associations, workers unions or cooperative organizations. Typical staff includes educators that provide direct care and carry daily activities with children, one (or two) supervising teachers, which provide pedagogical support for educators and plan classroom activities according to the state curriculum, a psychologist, a psycho-motor development specialist, a social worker, cooks, and cleaning staff. Educators are required to possess certification as an early childhood educator from INAU or as an early childhood assistant-technician from Uruguay's Council of Education Formation or have equivalent formation from a private institution approved by Uruguay's Ministry of Education and Culture, while teachers need to complete a 4 year degree as an elementary or early childhood teacher. The traditional organization in CAIFs centres consists of classrooms of one educator in charge of twelve to fifteen children of the same age during the whole day, which consists of shifts of four, six or up to eight hours. In the present study, we aim to evaluate the impact of changing the organization of CAIF centres in self regulation abilities and socioemotional development in 2 and 3 year-old children.

1.4 Effects for teachers

Innovation in educational programmes could have benefits for educators. Routine work has been linked to physical and emotional exhaustion, which might have an influence on educator's burnout symptoms (Chang, 2009). Burnout syndrome is characterized by the presence of elevated emotional exhaustion, depersonalization and reduced personal accomplishment (Maslach and Jackson, 1981). Both individual traits and work setting characteristics such as workplace conflict and role ambiguity have been linked to higher burnout levels on childcare workers (Manlove, 1993). Teachers' burnout has in turn also been correlated with higher absenteeism and disengagement, generating an uncomfortable classroom environment (Ghanizadeh and Jahedizadeh, 2015).

2 Centre re-organization

The intervention, named *Vaz Ferreira* after the early childhood education centre which originated it, stemmed from educator's own practices and experiences. Participating CAIF centre's educators received 8 training sessions which covered how to implement the present intervention through the introduction three main changes in centre's daily routines and general organization (see Table 2:

1. *Activity-centred classrooms*: instead of having one educator in charge of a group of children, activity-based classrooms were implemented. Teachers were in charge of a classroom that attended several groups of kids throughout the day. Each classroom covered a given subject (classrooms were divided thematically in "Science and Language", "Music" and "Art" to cover the national curriculum specifications). This organization implies that every day the teacher prepares and imparts a similar lesson to different groups, tailored to the characteristics of each age group.
2. *Optional activities with multi-age integration*: During the second half of the day classrooms change into optional spaces that consist of an unstructured and playful version of activity-based classrooms where educators stop active teaching to promote and facilitate play. Before selecting their optional activity for the day, children of all classrooms are gathered in a common space where personal sharing, singing and stories are implemented by a coordinating teacher in order to create a non-stressful environment. Importantly, children of different

Table 1: Daily activities for centres in the control condition

Daily greeting and breakfast				
Typical classrooms (Same-age) Teacher directed	4, 6 or up to 8 hours	Classroom A	Classroom B	Classroom C
		Art, Science and Language contents. Free play activities	Art, Science, Language and contents. Free play activities	Art, Science, Language and music contents. Free play activities
		Brief recess		
		Lunch		

Table 2: Daily activities for centres in the experimental condition

Daily greeting and breakfast				
Activity-based classrooms (Same-age) Teacher directed		Art Classroom	Music Classroom	Science and Language Classroom
	1st interval (50')	Group A	Group B	Group C
	↓	Class rotation (5-10 minutes)		
	2nd interval (50')	Group B	Group C	Group A
	↓	Class rotation (5-10 minutes)		
	3rd interval (50')	Group C	Group A	Group B
Optional activity selection (15-20 minutes)				
Optional spaces (mixed-ages) Child directed	4th interval (Mixed-ages) (50')	Children who selected painting, clay modelling, drawing, etc.	Children who selected books and puzzle solving	Children who selected pretend play
Lunch				

ages are integrated during these activities. After fifteen to twenty minutes of activity, the coordinating teacher will visit each optional activity classroom and provide children with the option of switching if they wish to.

3. *Teacher specialization* teachers are encouraged to choose the class they feel most comfortable teaching (either science/language, music or art) and focus their planning in that subject. Differences between traditional classroom organization and the proposed changes are visualized in tables 1 and 2:

3 Materials and methods

3.1 Participants

A total of 328 children (experimental group = 156; 74 female, control group= 172, 78 female) 24 to 48 months old (Mean age=35,5 months; SD=6,9) and 31 educators participated in the present study (control=13, experimental=18; 30 female).

3.2 Design

A cuasi-experimental design with pre-test and post-test assessments was used to evaluate the effects of the alternative setting (experimental group, as described in table 2 compared to traditionally organized centres (control group, which continued their usual practices as described in table 1). We collected teachers' reports on children's negative affectivity, effortful control and behaviour and conducted direct observation to register children's free play conducts. Participation in the study was completely voluntary and informed consent was requested from children's parents and teachers prior to data collection.

3.3 Instruments

3.3.1 Child Behaviour Questionnaire

Teachers completed the negative affectivity and effortful control subscales of the Children's behavior questionnaire (Putnam and Rothbart, 2006)- very short form (CBQ- VSF). Negative affectivity is related to the display of negative emotions like sadness, frustration and discomfort. Effortful control relates to children's inhibitory control, attentional

focus and soothingness (Putnam Rothbart, 2006). The first subscale has an Alpha coefficient of .87 and the second of .86. The same ECBQ-VSF subscales were used to assess 2 year old children with Cronbach alpha coefficients of 0.81 and 0.87 respectively.

3.3.2 Strengths and Difficulties Questionnaire

The Strengths and Difficulties questionnaire (SDQ 2-4 years old, Spanish version) is a brief behavioural screening questionnaire on child behaviour and emotion (Goodman, 1997). It consists of 5 subscales: hyperactivity, emotional symptoms, peer problems, conduct problems and prosocial behaviour (Goodman, 1997). The Cronbach alpha coefficients for each one was 0.77, 0.68, 0.55, 0.76 and 0.83 respectively.

3.3.3 Play Observation Scale

Direct observation of children's free-play behaviors were performed. The Play Observation Scale (Rubin, 2001) was used to assess children's predominant cognitive and social play behaviour. Children were observed during free play for 3 minute-intervals. Prior to beginning data extraction, a total of thirty practice observations were made in order to adjust for inter-observer differences. Inter-observer agreement scored 83% on the cognitive play scale and 87% on the social play scale.

3.3.4 Maslach's Burnout Inventory

The scale consists of 22 items and 3 subscales which measure participant's emotional exhaustion, depersonalizing and personal accomplishment reported with a 7 point (0-6) likert scale (Maslach and Jackson, 1981). The Cronbach alpha coefficients for each of the subscales was 0.87, 0.60 and 0.84 respectively.

3.4 Data analysis

All statistical analyses were conducted using R software and R Studio version 3.6.2 (Team, 2019) We excluded from the analysis subjects that lacked pre-test or post-test measures, and subjects whose questionnaires presented more than 20% unanswered items (thus resulting in varying sample-sizes across measures).

To account for proper completion, we did not include teacher questionnaires where more than 70% of the items had been given the same score.

209 children (control=97) had complete data in the Strengths and Difficulties questionnaire (Goodman, 1997) and 303 completed the appropriate version of the Child Behaviour Questionnaire (Rothbart et al., 2006), 163 (control=88) where in preschool level 3, while 140 where in preschool level 2 (control=55).

A total of 11 early childhood education CAIF centres participated in the study (control=5). The mean age in months of the children was 35.9 in the control group and 35.2 in the experimental group.

152 free-play observations were performed in total (control=63).

Finally, teacher's self report on their emotional exhaustion, depersonalization and personal accomplishment through Maslach's inventory (Maslach and Jackson, 1981) were compared through the Wilcoxon test.

4 Results

4.1 Children's self-regulation and play behaviour

We used mixed effects linear modelling to test for interaction effects between group condition (experimental and control) and time of evaluation (pre-test and post-test) on each of our variables using the LME4 package in R (Bates et al., 2015). We included random effects of individuals within centres to account for the nested structure of our data. The models conducted can be specified as:

$$Y_{ij} = \beta_0 + \beta_1 group_{ij} + \beta_2 time_{ij} + \beta_3 group \times time_{ij} + \mu_j + \varepsilon_{ij}$$

If the interaction factor in each model was found to be significant, we performed Tukey's HSD test for multiple comparisons. Table 3 details the results obtained for the regressions performed on each variable. We found significant interaction effects of time (pre-test and post-test measures) x group (experimental and control condition) for children's negative affect ($t=-2.18$, $p<0.05$), emotional symptoms ($t=-2.85$, $p<0.01$) and conduct problems ($t=-2.56$, $p<0.05$). Additionally, significant interaction effects were found for children's play behaviour in the social ($t=2.75$, $p<0.01$) and cognitive ($t=2.09$, $p<0.05$) dimensions. Post-hoc tests for within-group comparisons between pre-test and post-tests assessments for each variable are presented in table 4. Figure 1 shows the obtained distribution for each type of free-play behaviour by condition and time of assessment, revealing changes in the predominant type of play for children in the experimental condition (moving from predominance of sensory-motor functional play to constructive play in the cognitive dimension and from predominance of parallel play to an even frequency of parallel and associative play in the social dimension).

Table 3: Mixed effects linear models results used to test the effects of the intervention

Negative affect						Effortful control					
Fixed effects				Random Effects		Fixed effects				Random Effects	
Predictors	β	Std. error	p value	σ^2		Predictors	β	Std. error	p value	σ^2	
Intercept	29.08	1.81	***	$\tau_{00}participant_id : centre$	37.90	Intercept	54.6	2.41	***	$\tau_{00}participant_id : centre$	53.61
Group	1.69	2.43	0.50	$\tau_{00}centre$	11.28	Group	-0.70	3.26	0.83	$\tau_{00}centre$	48.96
Time	0.23	0.72	0.75	ICC	0.69	Time	1.13	0.86	0.18	ICC	24.41
Group x time	-2.18	1.00	0.02*	Conditional R ²	0.69	Group x time	1.83	1.19	0.12	Conditional R ²	0.58
Emotional Symptoms						Conduct problems					
Fixed effects				Random Effects		Fixed effects				Random Effects	
Predictors	β	Std. error	p value	σ^2		Predictors	β	Std. error	p value	σ^2	
Intercept	1.40	0.53	*	$\tau_{00}participant_id : centre$	1.96	Intercept	2.05	0.22	***	$\tau_{00}participant_id : centre$	0.83
Group	1.25	0.70	0.13	$\tau_{00}centre$	0.72	Group	0.02	0.30	0.93	$\tau_{00}centre$	0.50
Time	0.06	0.20	0.75	ICC	0.51	Time	0.08	0.13	0.52	ICC	0.10
Group x time	-0.78	0.27	0.004**	Conditional R ²	0.53	Group x time	-0.45	0.17	0.01*	Conditional R ²	0.43
Play (Social)						Play (Cognitive)					
Fixed effects				Random Effects		Fixed effects				Random Effects	
Predictors	β	Std. error	p value	σ^2		Predictors	β	Std. error	p value	σ^2	
Intercept	1.93	0.10	***	$\tau_{00}participant_id : centre$	0.58	Intercept	1.36	0.23	**	$\tau_{00}participant_id : centre$	0.46
Group	-0.03	0.14	0.82	$\tau_{00}centre$	0.06	Group	0.05	0.30	0.86	$\tau_{00}centre$	0.15
Time	-0.01	0.13	0.90	ICC	0.10	Time	0.09	0.12	0.43	ICC	0.13
Group x time	0.48	0.17	0.006**	Conditional R ²	0.15	Group x time	0.33	0.15	0.03*	Conditional R ²	0.38
Peer problems						Prosocial behaviour					
Fixed effects				Random Effects		Fixed effects				Random Effects	
Predictors	β	Std. error	p value	σ^2		Predictors	β	Std. error	p value	σ^2	
Intercept	2.21	0.43	**	$\tau_{00}participant_id : centre$	1.50	Intercept	6.69	0.69	***	$\tau_{00}participant_id : centre$	2.99
Group	-0.70	0.57	0.27	$\tau_{00}centre$	0.57	Group	-0.27	0.92	0.77	$\tau_{00}centre$	2.32
Time	-0.76	0.17	0.0002***	ICC	0.48	Time	0.24	0.24	0.31	ICC	1.24
Group x time	0.41	0.24	0.08	Conditional R ²	0.41	Group x time	-0.07	0.33	0.81	Conditional R ²	0.54
Hyperactivity											
Fixed effects				Random Effects							
Predictors	β	Std. error	p value	σ^2							
Intercept	3.83	0.77	**	$\tau_{00}participant_id : centre$	3.30						
Group	0.81	1.02	0.46	$\tau_{00}centre$	7.58						
Time	-0.49	0.26	0.06	ICC	1.34						
Group x time	0.22	0.35	0.52	Conditional R ²	0.73						

Table 4: Within-group post-hoc contrasts

Variable	Pre-test post-test contrast	Estimate	SE	df	t ratio	p value
Negative affect	Experimental group	1.9	0.68	301	2.84	0.02*
	Control group	-0.2	0.72	301	-0.31	0.98
Emotional symptoms	Experimental group	0.7	0.18	207	3.86	0.0009***
	Control group	-0.0	0.20	207	-0.30	0.98
Conduct problems	Experimental group	0.37	0.12	207	3.08	0.01**
	Control group	-0.08	0.13	207	-0.63	0.92
Play (Social)	Experimental group	-0.47	0.11	150	-4.14	0.0003***
	Control group	0.01	0.13	150	0.11	0.99
Play (Cognitive)	Experimental group	-0.42	0.10	150	-4.18	0.0003***
	Control group	-0.09	0.12	150	-0.78	0.86

Figure 1: Distribution of different play behaviors for each assessment and condition

4.2 Teacher burnout

Wilcoxon tests conducted at baseline showed statistically significant differences between groups for the emotional exhaustion subscale of Maslach's (1981) burnout scale (Control group median=9, experimental group median=17.5, $W=71.5$, $p=0.03$). After the intervention, Wilcoxon tests showcased that the differences detected at baseline had become non-significant (Control group median=10, experimental group median=9.5, $W=107$, $p=0.70$). No significant differences were found for the personal accomplishment and depersonalization subscales in the baseline nor at the post intervention measurements.

5 Discussion

The aim of this study was to evaluate the impact of a centre-reorganization intervention on young children's self regulation and general socioemotional development. We used a pretest-posttest design with a control group in order to compare outcomes in both conditions (novel and traditional centre organization). Our results show that children attending centres in which the novel organization was implemented reduced their levels of emotional symptoms, conduct problems and negative affect. In addition, children's observed play behaviour became more social and cognitively complex.

These results are particularly relevant in a context in which inexpensive, easy to implement interventions for early childhood education are in demand, mainly because of this period's established sensitivity to experiences and potential impact on future outcomes (Heckman, 2011).

However, several limitations of the present study should be taken into account. Firstly, it was not possible to assign double-blind randomized groups for each condition because the centres where the intervention took place were assigned by demand of each centre. Even though control centres were selected in order to match centre-size, neighbourhood socioeconomic characteristics and procure territorial proximity, some of our variables presented significant differences at pretest, as was the case for children's emotional symptoms and teacher burnout. To some extent, these baseline differences are congruent with centre's own predisposition to seek changes in their organization. Secondly and in line with our previous point, it'd be advisable for future research to incorporate active control groups in order to control for the possibility of confounding motivational factors inherent to participating in a novel condition.

The scope of the current investigation was strongly focused on children and their developmental outcomes, however, we consider occupational perspectives regarding the novel organization's effects on teachers should be further explored. Although limited by the aforementioned baseline differences, results in teacher burnout reports after the intervention are promising. Future studies should aim to replicate these results under more controlled conditions, as well as explore possible effects on teachers' perception of self-efficacy, motivation, tendency to collaborate, as well as planning behaviours under the novel organization.

The incorporation of more detailed individual demographic and socioeconomic variables would also be advisable in order to explore the links between SES and children's outcomes after the intervention. Even though previous literature states that plan CAIF provides care for mainly disadvantaged children (UNICEF et al., 2013; Midaglia and Robert, 2001; Gil and Cambón, 2014) subjects' individual differences regarding these variables were not measured in the present study as it was beyond the current research's main objectives. Ideally, this addition would entail a multidimensional approach to the conceptualization and measurement of childhood poverty (Kakwani and Silber, 2008) taking into account not only traditionally measured variables such as household income but also essential needs such as nutrition, education, access to healthcare, clean water and sanitation.

Lastly, the implementation of longitudinal designs has been a thoroughly recommended trend in educational and child development research and (Gustafsson, 2010). These would allow to follow cohorts of children into kindergarten and elementary education, providing the opportunity for detecting possible effects of the novel organization on children's further education during preschool and elementary school, as well as testing for the permanence of our reported effects.

We hypothesize that higher frequency of planned and concise activities accompanied by regular transitions implemented in the novel organization might have had an impact on children's demonstrations of negative emotions by promoting task engagement. Both embedding regular movement into the routine and introducing choice opportunities for children (elements present in the proposed novel organization) have been recently identified as lesson planning elements that help to promote children's engagement throughout the day (Nagro et al., 2018).

Another possibility is that the introduction of multi-age groupings provided children with different opportunities for interaction, therefore impacting on their approach to free play activities and their incorporation of self regulation strategies. The idea that multi-age grouping could provide children with developmental opportunities through the interaction with older peers goes back to Vygotsky's (1987) zone of proximal development. Support for extending this idea to the acquisition of socioemotional skills, specifically emotional self regulation, could be found in studies relating peer self regulation to children's own ability to self regulate (Montroy et al., 2016).

Moreover, recent research on children's natural pedagogic behaviour found children increase their non-verbal cues during relevant moments when interacting with a less-knowledgeable counterpart (Calero et al., 2015), supporting the notion that children as young as three years old are capable of utilizing appropriate cues to convey certain information more efficiently during teaching moments. Furthermore, research on the subject of peer-tutoring supports this dynamic is beneficial not only to "learner" peers (Rohrbeck et al., 2003) but to teacher peers as well. Evidence on the latter has been reported for both teenagers (Galbraith and Winterbottom, 2011) and elementary school students (Roscoe and Chi, 2007).

Given that the main purpose of this study was to evaluate the effects of the entire reorganization, more exhaustive research should be conducted using isolated variables in order to determine which specific aspect of the intervention (activity based classrooms, optional activities, being involved in multi-age activities, teacher specialization and the interaction with multiple educators) better explains our current results on children. This becomes increasingly important for variables where evidence is lacking or controversial: for example, despite much promise, long term multi-age grouping has led to literature reviews with conflicting results in student achievement (Veenman, 1995; Katz et al., 1990; Mason and Burns, 1995), while teacher specialization has recently been questioned in a study by Fryer Jr (2018), which provides data on the effects of specialization at the elementary school level. The effects of transitioning from one class to another are also worth further exploration, a study conducted by Cryer et al. (2005) found that negative or disruptive behaviour diminished post transition, while children's probability to experience distress increased. However, both these outcomes disappeared after a few weeks, suggesting children managed to adapt to the new-found dynamic with time.

As for optional activities, our results could be aligned with recent findings by Goble and Pianta (2017) which related time spent in free-choice activities with increased inhibitory control. Finally, results showing both children's decreased negative affectivity and enhanced cognitive and social play behaviour are congruent with recent literature suggesting that children with higher levels of negative emotion expressions formed less social play relationships (Neal et al., 2017).

6 Conclusion

Overall, the present study provides evidence for positive effects of a novel organization in CAIF centres on young children's socioemotional development, specifically in their negative affect and emotional symptom expression, reduced conduct problems and enhanced social and cognitive playing behaviours. This particular intervention was created and designed by educators based on their decades-long experience as well as their own understanding of the needs of the community, and independently assessed by researchers. We hope that the present study highlights the importance of implementing and evaluating small scale, low cost, innovative experiences that seek to optimize the limited material and financial resources available in low socioeconomic contexts. Experiences like the one presented here might either shed light into practices with interesting results, or allow researchers and practitioners to question current methods and create opportunities for improvement, thus increasing the much needed interaction among researchers and educators.

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