Classroom as a secure base and safe haven:
Nurture Group implementation in two Montreal schools

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Abstract

Nurture Groups (NGs) are a school-based intervention for children who missed out on healthy early attachment experiences and who, as a result, present with marked impairments in social, emotional and behavioural functioning upon school entry. Researchers have consistently found that students are significantly more likely to exhibit improvements in school functioning by attending a NG. However, broad theoretical guidelines and a paucity of research on fidelity of implementation to the classic NG model make it difficult to know which elements of NGs are most responsible for its positive outcomes. To begin to address gaps in the research, the overarching objective of the present study was to produce a systematic and concrete description of NG implementation in two Montreal, Quebec-based schools. Overall, results revealed only modest departures from the classic model in organisation, resources and teaching practices within this NG variant. A subsequent companion study will evaluate student outcomes in response to this variant model.

Data availability statement: The data that support the findings of this study are available on reasonable request from the corresponding author.

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In the 1960s, educational psychologist Marjorie Boxall introduced the idea of NGs in response to the growing number of children who were struggling to meet basic grade-level behavioural and academic expectations in the inner-city elementary schools of London (Cooper & Tiknaz, 2007; Lucas, 2019). The rationale for these groups was based primarily on the belief that children who miss out on healthy early attachment experiences develop negative internal working models of the self (eg, as unworthy, unwanted, defective) and of others (eg, as unavailable, unresponsive, rejecting) and, consequently, are less prepared to cope with the emotional and practical demands of school life (Boxall & Lucas, 2010; Geddes, 2017). Given this emphasis on the compromising effects of a negative working model of attachment, NGs were designed to offer reparative attachment experiences within the school setting (Bennathan, 2012). More specifically, Boxall sought to provide children with the opportunity to re-experience early nurturing care in a safe, predictable environment wherein the development of a secure and trusting relationship with a secondary attachment figure (ie, the teacher) would act as a vehicle for improved self-regulation, self-worth and overall school functioning.

Boxall's conceptualisation of NGs came to life in the 1970s, with Sylvia Lucas becoming the first nurture teacher. Through interactions between Boxall, Lucas and other early collaborators, NGs

were formalised into the *classic* model known today (Lucas, 2019). Operationally, the classic NG is described as a short-term intervention provided by a teacher and a teaching assistant to four to eight-year-olds in class groups of 10 to 12 students (Bennathan, 2012; Boxall & Lucas, 2010). The intervention runs for four-and-a-half days per week in the children's community schools and provides a structured intervention involving academic, social-emotional learning activities and opportunities for play (Colley, 2017; Cooper & Tiknaz, 2007). Importantly, children are not held to grade-level standards and staff are non-judgmental in their responses to students' learning limitations. NGs offer a balance of educational, domestic and play experiences aimed at supporting the development of the children's relationships with the staff and with each other (Colley, 2017). There is an emphasis on the adults engaging with the children in reciprocal, shared activities (eg, meals/reading/talking about events and feelings) that staff use as opportunities to show interest in the children's external and internal worlds (Doyle, 2003). The classic NG combines standard classroom features with homey décor and furnishings (eg, couch, dining table, play area). In order to maintain a sense of belonging to their homeroom, students remain on their mainstream class list and present themselves each morning for attendance. Additionally, students participate in lessons in their mainstream class for one afternoon per week. Typically, children attend the NG for three to four school terms before returning to their mainstream class on a full-time basis. A return to their mainstream class is treated as a gradual transition process to facilitate student adjustment and begin to transfer attachments from NG staff to the mainstream class teacher (Bennathan, 2012).

Today, nearly five decades after the establishment of the first NG, more than 2,000 schools across the United Kingdom have adopted NGs as part of their response continuum for vulnerable and mistreated children (nurtureuk, 2019). Moreover, researchers focusing on the intervention's efficacy have consistently found that students who participate in a NG programme for at least two terms are significantly more likely to demonstrate improvements in school functioning than students who remain in their mainstream classrooms (Cooper & Whitebread, 2007; Hughes & Schlösser, 2014; Seth-Smith et al, 2010; Shaver & McClatchey,

2013). Unfortunately, the increasing popularity and institutional support for NGs has not yet inspired investigators to systematically address the question of *implementation fidelity* (ie, the degree to which a NG reflects the theoretical origins and organisational features of Boxall's classic model) despite this issue having been identified as a key research need (Balisteri, 2016; Fraser-Smith & Henry, 2016). There is also a paucity of research explicitly linking positive student outcomes to specific, measurable practices within NGs (Bennett, 2015; Kearny & Nowek, 2019). This gap in the literature likely reflects a lack of clearly defined expectations for NG personnel.

The limited specificity of NG pedagogical guidelines is readily illustrated by consideration of the *Six Nurture Principles for Learning,* intended to inform daily classroom practices: (1) learning and achievement is enhanced through meeting social, emotional and cognitive needs, (2) how we communicate impacts on mental health, learning and achievement, (3) nurture cultures promote reflective practices, (4) self-esteem and a sense of identity are key to positive mental health and wellbeing, (5) feeling emotionally safe is essential for mental health, learning and achievement, and (6) celebration of diversity enriches the community and enhances learning (Nurture International, 2021). Although these principles readily evoke associations to foundational concepts in child development, they do not lend themselves to easy or uniform operationalisation. Similarly, NG curricula is of necessity linked to the national or regional educational guidelines for the countries in which the NG is located (eg, England, Scotland, Wales, Northern Ireland, Canada, New Zealand) and, as such, varies from jurisdiction to jurisdiction (Cooper & Tiknaz, 2007).

As a result, school boards in different countries have implemented versions of NGs and adjusted some of their organisational elements to meet the needs of the communities they represent (Bégin et al, 2020; Bishop, 2008; Cooper, 2004). This way of responding to the lack of specificity in NG operationalisation has led to the emergence of several 'local variants' over the years that depart from the classic NG model (Cooper & Whitebread, 2007; Middleton, 2021). Without greater clarity around the explicit practices that comprise an effective NG, it is difficult for school

board stakeholders to reliably replicate its most essential ingredients (Breitenstein et al, 2010). Thus, the goal of the present study was to provide a detailed account of NG implementation in two Montreal-based schools in order to describe how NGs outside the UK are being operationalised, as well as to begin to connect specific practices within NGs to the meaningful improvements in school functioning demonstrated by students who have graduated from an NG.

Research to date: NG implementation and fidelity

To date, there are no published studies that have investigated fidelity to both the organisational and interventional features of classic NGs. However, one study indirectly measured organisational fidelity to the *Procedures for the Operation of Secondary Nurture Bases* established by the Glasgow City Council Education Services (2017). Grantham and Primsore (2017) interviewed personnel from seven secondary-level NGs to evaluate the following: (a) adherence to intake and discharge procedures, (b) staff training, (c) referral protocols, (d) student ages, (e) pre- and post-intervention measures, (f) number of terms a student remained in the programme, (g) frequency of meetings between leadership team and classroom personnel, and (h) parental involvement. Overall, considerable variability in organisational fidelity emerged across NGs. These results are not surprising given recent evidence that contained class groups bearing the name 'NG' often differ in the extent to which they adhere to the theoretical and practical underpinnings of Boxall's classic NG (Bennett, 2015; Cooper & Whitebread, 2007; Middleton, 2021).

Also not surprising, given the absence of concrete, uniform expectations for NG personnel, is that only a few studies have specifically examined teacher behaviour within the NG classroom. One example is the research of Colwell and O'Connor (2003) which found that, relative to their mainstream counterparts, NG teachers demonstrated significantly more positive verbal and non-verbal communication in response to student behaviour (eg, showing interest, nurturing students' ideas, providing attuned, informative and spontaneous praise, etc.) and significantly less negative verbal and non-verbal communication (eg, fewer controlling lessons, less bland praise and fewer demeaning behaviour management practices). In addition, the style of communication used in NGs was more 'relational' (Hibbin, 2019), conveying feelings of warmth and acceptance and facilitating a classroom climate in which the students felt safe, valued and supported (Colwell & O'Connor, 2003). In a related study, Bani (2011) found that specific verbal praise was used twice as often relative to non-verbal praise by NG teachers. The authors hypothesised that the use of verbal praise was effective because it was 'personal, genuine, contingent and descriptive (mentioning desired behaviour) and provided specific information, where the pupil understood why they are being praised' (Bani, 2011, p. 62). In response, children were more likely to maintain positive behaviour.

Another study related to NG classroom practices (Cubeddu & MacKay, 2017) evaluated the implementation of a key component of nurturance and secure attachment relationships known as 'attunement' (Schore, 2001). Attunement strategies examined in this study included being attentive, encouraging initiatives, receiving initiatives, developing attuned interactions, guiding and deepening discussion (Cubeddu & MacKay, 2017; Kennedy, Landor & Todd, 2011). Results revealed a significantly higher frequency of attunement strategy implementation in NGs relative to mainstream classes, suggesting that NG staff are more responsive to the social, emotional, behavioural and academic needs of their students.

Context of the study

In Quebec, a bilingual province in Canada, there is clear indication that a growing number of children would benefit from a secure attachment base outside the home (Hélie & Clément, 2016). However, despite rising rates of verified cases of abuse and a public education system that is well positioned to support the development of children, there are no ministry-endorsed specialised programmes aimed at supporting students who are at risk because of social, emotional and mental health (SEMH) difficulties. Inspired by the widespread adoption of NGs in the UK, one Montreal-based school board independently set up two full-time NGs that have been in continuous operation for the last 12 years.

These classes were developed based on the founding principles of classic NGs and adapted to the context of the province's education system and resources. As such they represent a NG variant; more specifically a NG-Variant 2 which adheres to the 'important principles of the classic model but differs in structure and/or organisational features' (Cooper et al, 2001, p. 88). The Montreal NG classes target students in Grades 1-3 (ie, six to nine years) with very significant SEMH difficulties, for whom school personnel strongly suspect an insecure or disorganised attachment style and/or who have a documented history with child protection services. As the school board covers a large geographical area, students are assigned to the NG that is closest to the neighbourhood in which they reside (ie, a point-of-service model). A formal research partnership was established with the Montreal NG teams to document NG implementation outside the UK. A companion study will investigate student outcomes in response to this NG variant model.

Research Objectives

A mixed-method study design with four main objectives was employed to document intervention implementation. The first objective was to develop a systematic programme description reflecting the operationalisation of these Montreal NG variants. Next, to determine whether the reported description was consistent with day-to-day implementation, the second and third objectives were to evaluate organisational and personnel fidelity to the variant model. In the context of this study, 'organisational fidelity' refers to the implementation of intervention supports (eg, provision of resources, staff training, etc.) whereas 'personnel fidelity' refers to the implementation of the intervention itself (ie, teacher behaviour). Specifying the degree to which intervention implementation matches an intervention's conceptualisation enhances the validity of an outcome study, and the strength of this relationship is the best estimate of implementation quality (Breitenstein et al, 2010). The final objective was to investigate perceived facilitators and barriers to NG implementation.

Ethics

The present study was carried out in accordance with the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans of the Canadian Panel on Research Ethics,* whose research ethics committee approved this study. Ethical approval was also granted by the Research Ethics Committee for Student Projects at the University of Quebec in Montreal, as well as by the Montreal school board's own internal ethics committee. NG teachers, teaching assistants and special education technicians, as well as the NG clinical director and the assistant director of student services, were made aware of this study by means of an informational flyer shared with the school board's director of student services. Interested candidates were invited to contact the lead author. Informed consent was obtained from all NG team members prior to the commencement of the observations. Consent forms outlined (a) the general objectives of the study, (b) experimentation procedures, (c) advantages and risks, (d) data confidentiality, and (e) the right to withdraw consent at any time without any prejudice. Additionally, the contact information of each author and of the ethics committee was made available in case of comments, questions, or complaints. The participants were also informed of the authors' aim to publish the study in a peer-reviewed journal once completed. At the end of the study, all participants were debriefed on the results.

Methodology

When a comprehensive programme description is not readily available, the use of a Logic Model is recommended (Chen, 2015). A Logic Model can be understood as a graphical representation of the relationship between a programme's inputs, outputs and intended outcomes (Knowlton & Phillips, 2013). Inputs are defined as resources dedicated to, or consumed by the programme, outputs are direct products of programme inputs (eg, activities provided, people reached) and outcomes are the benefits resulting from the programme (eg, improved school functioning). As the NGs in this study are NG-variants (ie, adhering to the principles of the classic model but differing in some organisational features linked to the particular needs and resources of a Montreal school board), a Logic Model offers a comprehensive means of describing the ways in which these groups depart from Boxall's classic NG. Other benefits of a Logic Model include: (a) helping staff gain a common understanding of

how an intervention works, (b) helping staff to understand their individual responsibilities, and (c) identifying indicators of success, or specific practices that can be linked to improvements in student school functioning (Chen, 2015).

To develop the programme description (ie, objective 1), the Montreal NG team was engaged in a participative four-step process. In Step 1, the NG clinical director and the classroom teams from both NGs completed a Logic Model template based on their experiential history in the program. The result of this activity was three independent Logic Model drafts. In Step 2, the models were compared via a collaborative discussion process among NG personnel that was facilitated by the lead researcher. In Step 3, the lead researcher presented a single, common version of the Logic Model that integrated the elements that were found to be consistent across drafts and that reflected the team's discussion to reconcile areas of divergence. The NG personnel had the opportunity to review, discuss and request additional edits. In the last step, a final version of the Logic Model was presented and a consensus was reached among team members.

To evaluate the degree to which intervention supports and resources outlined in the Logic Model were made available to the NGs and/or implemented by the NGs (ie, organisational fidelity; objective 2), record reviews of one full school year, as well as ten monthly site visits in each NG were conducted. For the evaluation of personnel fidelity (ie, objective 3), the Montreal team identified the following pedagogical practices in their Logic Model as being key differentiators between NG teacher and mainstream teacher behaviour: being attentive, encouraging initiatives, receiving initiatives, developing attuned interactions, guiding discussion, deepening discussions and constructive behaviour support (Table 1). Apart from constructive behaviour support, the other six strategies, based on the work of Kennedy, Landor and Todd (2011), are commonly referred to as 'attunement strategies' and have been a focus of Montreal NG staff training since the inception of the program. These strategies are rooted in attachment theory and considered ways by which adults create a secure base and safe haven for children (Ainsworth et al, 2015; Whelan & Stewart, 2015). Not surprisingly, they have been found to

promote attuned interactions between caregivers and children in two meta-analyses (Bakermans-Kranenburg, Van Ijzendoorn, & Juffer, 2003; Fukkink, 2008).

As the implementation of attunement strategies by NG and mainstream teachers in the UK has been previously investigated by Cubeddu & MacKay (2017), the same methodology was employed in the present study to allow for comparison. Two 60-minute observations in each NG class and in six different mainstream classes of corresponding grade levels (ie, grade 1 to grade 3) across a one-month period were conducted by two trained research assistants. Inter-rater reliability (IRR) was conducted for 7 of the 16 hours of total observation time. The mean IRR across seven hours of reliability verification was 87% with no single category falling below 80%. A structured observation form provided by the authors was used for data collection. No single strategy was recorded more than once in any 60-second period to ensure the recording of distinct episodes of strategy implementation. As NGs are characterised by favourable staff-to-student ratios, observations focused solely on teacher behaviour rather than classroom support staff behaviour to avoid unfairly biasing results toward NGs (ie, more staff and fewer students should yield more opportunities for strategy implementation). It is worth noting that each NG had eight students compared to, on average, 12 students per mainstream class. Under normal circumstances, approximately 20-25 students would attend a mainstream class in Quebec schools. However, given that this study took place at the height of the Covid-19 pandemic, many families favoured remote schooling options over in-class learning.

The data collected across observations was used to answer the following questions about NG and mainstream teaching practices:
a) Did the total occurrence of strategy implementation differ significantly between the NG and the mainstream teachers?
b) Did the occurrence of each individual strategy differ significantly between the NG and mainstream teachers?
c) Did the total occurrence of strategy implementation differ significantly between the two NG teachers?

d) Did the occurrence of each individual strategy differ significantly between the two NG teachers?

e) Did the total occurrence strategy implementation differ significantly between the six mainstream teachers?

Lastly, a questionnaire was completed by each NG teacher, special education technician and teaching assistant to better understand the factors that were perceived to facilitate and limit personnel fidelity, whereas the NG clinical director and the school board's assistant director of student services reported primarily on variables related to organisational fidelity.

Table 1
Description of constructive behaviour support and attunement strategies, adapted from Cubeddu & MacKay (2017)

Being attentive	Looking interested with friendly posture; giving time and space for the child and each other; wondering about what the child is doing, thinking or feeling; enjoying watching them.
Encouraging initiatives	Waiting; listening actively; showing emotional warmth through intonation; naming positively what you see, think or feel in regard to the child or to the child's actions; using friendly and/or playful intonation as appropriate; saying what you are doing; looking for initiatives.
Receiving initiatives	Showing you have heard and noticed the child's initiative; receiving the child's overture/approach/initiative with receptive body language; being friendly and/or playful as appropriate; returning eye contact, smiling, nodding in response; receiving what the child is saying or doing with words; repeating/using the child's words and phrases.
Developing attuned interactions	Receiving and then responding to the child's overtures or initiatives; checking to see if the child is understanding you; waiting attentively for your turn; having fun; giving a second (and further) turn on the same topic; giving and taking short turns; contributing to interaction/activity equally; cooperating – helping each other.
Guiding	Extending, building on their response; judging the amount of support required and adjusting; giving information when needed; providing help when needed; offering choices that they can understand; making suggestions that they can follow.
Deepening discussion	Supporting goal setting; sharing viewpoints; collaborative discussion and problem-solving; naming difference of opinion; investigating the intentions behind words; naming contradictions/conflicts (real or potential); reaching new shared understandings; managing conflict.
Constructive behaviour support	Feedback to students that clearly delineates/describes the rules, routines and rituals of the classroom; feedback to the child that offers a simple explanation for the rules/routines/rituals; concrete and discrete behavioural feedback; feedback that provides children with clear direction about what they are expected to do rather than just labelling the inappropriate behaviour they are currently demonstrating (eg, I need you to stop talking to Timmy and start your worksheet); use of a holding environment (ie, the physical and interpersonal classroom environment that promotes the child's maturation and development) and restorative language management.

Results

Objectives 1 & 2: Programme description and organisational fidelity

The result of a stepwise collaboration between NG team members was a comprehensive programme description in the form of a Logic Model (Figure 1, objective 1). The availability and frequency of resources reportedly provided by the school board as organisational supports to the nurture classes was found to be consistent with actual implementation. Specifically, this included the cost of the programme, the availability of materials, technology, physical space, classroom staff to student ratios, specialised door-to-door transportation as well as before and after school daycare services. This also included the frequency of psychotherapy offered to students and families by the NG psychologist, parent meetings, communications with health and social services, case consultations provided by specialists (eg, speech and language pathologist, occupational therapists), intake and discharge support, staff supervision and training by the NG clinical director and whole-school workshops delivered to mainstream teachers about nurturing practices.

Figure 1
Quebec-based nurture group logic model for a single classroom

Inputs		
Personnel • Full-time classroom personnel: 1 teacher, 1 teaching assistant, 1 special education technician • Part-time personnel: 1 programme director, 1 psychologist, 1 vice principal, 1 principal	**Cost** $250,000 CAD	**Technology** iPads, computers
Equipment/physical space One classroom, one domestic space, one relaxation area	**Materials** • Developmental curriculums (eg, socio-emotional) • Academic curriculums and learning materials • Classroom and home decor furnishings • Food availability	**Consult staff** Speech and language therapist, Occupational therapist, Social worker, etc. **Specialised bus and driver**

Outputs

Class organisation

- 1 teacher, 1 teacher assistant, 1 special education technician
- 8 students, 6-9 years

Transport and daycare

- Daily door-to-door specialised transportation for all NG students from their domicile to the NG host school, round-trip
- Before and after school daycare services provided by the school hosting the NGs

Consistent implementation of core intervention elements by teachers:

- Being attentive
- Encouraging initiatives
- Receiving initiatives
- Developing attuned interactions
- Guiding
- Deepening discussions
- Constructive behaviour support

Weekly supports

- 8x student psychotherapy sessions by programme psychologist
- 2x family psychotherapy sessions by programme psychologist
- 3x school progress meetings w/guardians by NG classroom personnel
- 2x meetings with social services for students by NG classroom personnel and programme psychologist

Annual supports

- 6x NG classroom personnel act as liaison to health services for students
- 2x NG classroom personnel act as a liaison to health services for guardians
- 2x NG classroom personnel accompany student and guardian to medical appointment

Intake support per student:

- 1x intake meeting with school of origin
- 1x intake meeting with guardian(s)
- 1x observation in school of origin
- 1x case review by programme director with the NG team

Discharge support/ student

- 1x discharge meeting with guardian(s)
- 1x discharge evaluation/ report
- 1x meeting with school of origin
- 5 days of reintegration support
- 3-5 days of post-reintegration support

Other supports

- 4 hours of bi-weekly supervision and training for classroom personnel
- 10 workshops offered to mainstream school board staff on nurturing and trauma-informed practices
- 6 case consultations with multidisciplinary professionals per class

Outcomes

Reduced SEMH difficulties	Improved student-teacher relationship	Improved self-concept
Improved executive functions	Re-integration into a general education setting	

Objective 3: Evaluation of personnel fidelity

The Chi-square goodness of fit test was employed to compare observed frequencies with expected probabilities. All analyses were conducted using the χ^2 test function on GraphPad Prism Version 9.1.2 for Mac (San Diego, CA: GraphPad Software).

Analysis 1: Did the overall frequency of strategy implementation differ significantly between NG and mainstream teachers?

A total of 417 strategy implementations were observed for the two NG teachers across four hours of observation. In comparison,326 strategy implementations were recorded for the six mainstream teachers across 12 hours of observations. When expected frequencies were adjusted to account for the fact that there were more mainstream teachers than NG teachers (ie, six and two, respectively), results revealed a significantly higher frequency of constructive behaviour support and attunement strategy implementation by the NG teachers (χ^2=383.90, df=1, p<0.0001).

Analysis 2: Did the frequency of each individual strategy differ significantly between the NG and mainstream teachers?

The χ^2 goodness of fit test was performed separately for each of the seven strategies. The observed frequencies represent the sum of both observations for each category. When expected frequencies were adjusted to account for the fact that there were more mainstream teachers than NG teachers (ie, six and two, respectively), results revealed a significantly higher implementation frequency of each individual strategy by NG teachers. The most striking differences were observed for 'deepening discussions' (χ^2=70.21, df=1, p < 0.0001) and 'constructive behaviour support' (χ^2=123.6, df=1, p < 0.0001).

Table 2
Observed and expected frequencies of overall strategy implementation by NG vs mainstream teachers

Being attentive	NG teachers (two teachers)	Mainstream teachers (six teachers)	Significance
Observed frequencies	417	326	χ^2=383.90, df=1, p<0.0001
Expected frequencies	185.8 (25%)	557.30 (75%)	

Table 3
Observed and expected frequencies for each individual strategy by NG vs mainstream teachers

	NG teachers (two teachers)		Mainstream teachers (six teachers)		Significance
	F_o	F_e (25%)	F_o	F_e (75%)	
Being attentive	52	25	48	75	$\chi^2=38.8$, df=1 $p < 0.0001$
Encouraging initiatives	56	24.75	43	74.25	$\chi^2=52.61$, df=1 $p < 0.0001$
Receiving initiatives	57	29.75	62	89.25	$\chi^2=33.28$, df=1 $p < 0.0001$
Developing attuned interactions	35	13	17	39	$\chi^2=49.64$, df=1 $p < 0.0001$
Guiding	92	47.25	97	141.75	$\chi^2=56.51$, df=1 $p < 0.0001$
Deepening discussion	25	6.5	1	19.5	$\chi^2=70.21$, df=1 $p < 0.0001$
Constructive behaviour support	100	39.50	58	118.5	$\chi^2=123.6$, df=1 $p < 0.0001$

Analysis 3: Did the overall frequency of strategy implementation differ significantly between the two NG teachers?

The total frequencies recorded during observations were 104 and 106 for NG 1 and 112 and 95 for NG 2. When the sum of observed frequencies in each NG were tested against expected probabilities (ie, equal frequencies of implementation), the difference was insignificant ($\chi^2=0.02158$, df=1, p = 0.8832). In other words, the total occurrence of constructive behaviour support and attunement strategy implementation was similar across NGs.

Table 4
Observed and expected frequencies of overall strategy implementation by each NG teacher

	NG 1	NG 2	Significance
F_o	210	207	$\chi^2=0.02158$, df=1 $p = 0.8832$
F_e (50%)	208.5	208.5	

Analysis 4: Did the frequency of each individual strategy differ significantly between the two NG teachers?

The χ^2 goodness of fit test was performed separately for each of the seven strategies. The observed frequencies represent the sum of both observations for each category. The expected probability represents the assumption that strategies are implemented equally by NG teachers. Results revealed insignificant differences between NG teachers. In other words, the occurrence of each individual strategy was comparable across NGs.

Table 5
Observed and expected frequencies of individual strategy implementation by NG teacher

	NG 1		NG 2		Significance
	F_o	F_e	F_o	F_e	
Being attentive	25	26	27	26	$\chi^2=0.07292$, df=1 p = 0.7815
Encouraging initiatives	30	28	26	28	$\chi^2=0.2857$, df=1 p = 5930
Receiving initiatives	27	28.5	30	28.5	$\chi^2=0.1579$, df=1 p = 6911
Developing attuned interactions	17	17.5	18	17.5	$\chi^2=0.02857$, df=1 p = 0.8658
Guiding	48	46	44	46	$\chi^2=0.1739$, df=1 p = 0.6767
Deepening discussion	12	12.5	13	12.5	$\chi^2=0.04$, df=1 p = 0.8415
Constructive behaviour support	49	50	51	50	$\chi^2=0.04$ df=1 p = 0.8415

Analysis 5: Did the total frequency of strategy implementation differ significantly between the six mainstream teachers?

When the sum of observed frequencies in each mainstream class were tested against expected probabilities (ie, equal implementation), the χ^2 goodness of fit test revealed a significant difference ($\chi^2=29.11$, df=5, p < 0.0001). This implies that the total occurrence of constructive behaviour support and attunement strategy implementation varied significantly across mainstream teachers.

Table 6
Observed and expected frequencies of overall strategy implementation by mainstream teacher

	Mainstream 1	Mainstream 2	Mainstream 3	Mainstream 4	Mainstream 5	Mainstream 6	Significance
F_o	46	80	73	48	36	43	$\chi^2=29.11$, df=5 p < 0.0001
F_e (16.67%)	54.33	54.33	54.33	54.33	54.33	54.33	

Objective 4: Facilitators and barriers of NG intervention fidelity

Classroom personnel, the NG clinical director and the assistant director of the school board's department of student services each felt strongly that a solid theoretical understanding of NGs (ie, 'why we do the things we do') facilitates implementation fidelity (8/8). Other facilitating factors included effective communication between team members (5/6), supervision (6/6), training (6/6) and a skilled and dedicated NG clinical director (6/6). Importantly, classroom personnel reported being extremely satisfied with the quality and consistency of supervisory support from the clinical director (6/6). Respondents also reported that supervisory support allows for continuous skill development (5/6) and emotional support to staff (6/6), and helps them better understand the reasons underlying each child's SEMH difficulties (6/6). One staff member remarked that the supervisor 'allowed us to work at our best as we always felt prepared for the challenges faced and we know someone is there for us if we need it.'

Barriers to NG implementation were identified as student absenteeism (5/6) and inconsistent parental availability/engagement (6/6). Perhaps unique to this study, the Covid-19 pandemic was reported as an additional barrier to NG implementation fidelity (6/6). Three main difficulties emerged from the pandemic: (1) social distancing requirements limited the teams' ability to meet students' proximity-seeking needs (6/6), (2) facial masks made it difficult to quickly identify and meet students' emotional needs (eg, reading or exchanging facial expressions) (5/6), and (3) facial masks muffled voices and made it hard to understand and be understood by students (eg, degree of distress, empathic tone) (5/6).

The assistant director of student services and the NG clinical director identified several ways organisational fidelity can be compromised. First, the ideal NG classroom size required to meet students' unique needs (ie, space for domestic activities, space to contain behavioural dysregulation, space for traditional teaching activities) may be limited by a host school's space availabilities. Secondly, the ability to provide round-trip door-to-door specialised transportation for NG students is dependent on the transportation company's resources. Moreover, the coordination of transportation routes can be complex given that students are coming from different municipalities across a wide geographical area (ie, point-of-service model). Lastly, it was reported that considerable discussion time is required to obtain special permission from the relevant unions within the school board to be able to give priority to qualified candidates over candidates who have accumulated greater seniority but who do not necessarily have the specialised training/orientation necessary to work within NGs (2/2).

Discussion

To date, the research base addressing implementation in NGs is limited and it remains difficult to determine whether the various NGs that have been shown to improve student social-emotional-behavioural functioning used a set of interventions of comparable form and fidelity. The present study sought to bridge this research gap by comprehensively evaluating the implementation of two Montreal-based NGs. The Logic Model (Figure 1) developed by NG personnel revealed a measurable programme description that was found to be quantitatively representative of the NGs' practical realities. At an organisational level, the resource-intensive nature of NGs in this study

resembled a hospital-based child psychiatry day programme to a greater degree than it did a mainstream classroom. In terms of classroom practices, constructive behaviour support and attunement strategy implementation were reported as being the principal pedagogical and treatment interventions differentiating NGs from mainstream classrooms. This was confirmed by classroom observations in which NG teachers were found to use a significantly higher overall frequency of constructive behaviour support and attunement strategies relative to mainstream teachers of corresponding grade levels. This also held true when the frequency of each individual strategy was analyzed separately; suggesting that NG staff are significantly more sensitive and responsive to students' emotional needs, helping them feel valued and held in mind. Apart from the element of constructive behaviour support implementation unique to the present study, results are consistent with those of Cubeddu and MacKay (2017).

A closer inspection of individual strategies revealed that the routine provision of constructive behaviour support to students most clearly differentiates the Montreal NGs from mainstream classes. This suggests NG staff are more intentional in the prevention, co-regulation of emotion and response to dysregulation – a particularly important finding considering that SEMH difficulties are among the leading reasons students are removed from their mainstream classrooms (Hemphill et al, 2014). After constructive behaviour support, use of the deepening discussion strategy differentiated NGs most significantly from mainstream classes. Deepening discussion involves sharing viewpoints, collaborative conversations, naming differences of opinion and reaching new shared understandings (ie, connection). However, it is worth noting that deepening discussion had the lowest frequency of implementation when compared to the other strategies in both NG and mainstream classes. The relatively limited use of this strategy is not a reflection of teachers' disinterest in their students' opinions or internal worlds. Instead, it likely reflects the significant amount of time teachers would need to be separated from the whole NG group in order to provide undivided attention to a single student. In mainstream classes with higher staff-student ratios (ie, 1:12 in mainstream compared to 3:8 in NGs for this study), it may not be possible

for teachers to systematically practice deepening discussions with each individual student while also managing the larger group and meeting curriculum standards. Across 12 hours of observations, this strategy was only observed once in mainstream classrooms, compared to 25 occurrences across four hours of observations in NGs. The lower staff-student ratios of NGs likely provides teachers and support staff the opportunity to individualise interaction to a greater degree than would otherwise be possible.

It is also worth noting that overall and individual strategy implementation did not differ significantly between NG teachers, implying that the Montreal-based NGs delivered an equivalent intervention that was consistent with their programme description (ie, Logic Model). However, when the overall frequency of strategy implementation was compared across the six mainstream teachers, a statistically significant difference emerged. The finding of greater homogeneity in attunement strategies among NG teachers as compared to mainstream teachers is not unexpected given that these strategies are intentionally taught, monitored and reinforced by the NG clinical director, whereas such specific training and support is rarely provided to mainstream teachers.

Limitations and future directions

The NG programme description and implementation assessment revealed two noteworthy departures from Boxall's classic NG. The classic model was designed to accommodate students aged four-eight years in groups of 10-12 in their neighbourhood school supported by one teacher and one teaching assistant. The Montreal-based NGs accommodated students aged between six and nine years in groups of eight with one teacher and two support staff. As students generally did not remain in their neighbourhood schools but instead were transported to a different school that was the host site for the NG – daily visits to their homerooms were not an option. Second, although designed and intended to adhere to the 'Six Nurture Principles for Learning' (Nurture International, 2021), it is possible that the Montreal NGs operationalised or emphasised these principles in slightly different ways or proportions than is the case in more classic NGs. It was evident that the Montreal NGs implemented constructive behaviour support and attunement strategies in

a routine way and at much higher frequency than in matched traditional classrooms, but the extent to which these findings generalise to other classic NGs is hard to specify. Moreover, the resources unique to these Montreal NGs (eg, weekly play therapy) may not reflect NG implementation in other jurisdictions. In addition to the small-scale nature of this study, the generalisation of the results may have been constrained to some degree by the social distancing and facial masks regulations necessitated by the Covid-19 pandemic. More specifically, NG staff reported that the pandemic consistently made it more difficulty to meet students' proximity-seeking safe-haven needs, as well as and to convey and interpret emotional tone (ie, to be as attuned as they would have been under normal circumstances).

Implementation fidelity strengthens the validity of outcome studies and it is the best estimate of implementation quality (Breitenstein et al, 2010). The absence of data linking specific classroom practices to student outcomes limits the conclusions that can be drawn from research in support of NGs as an effective school-based intervention for at-risk students. For this reason, future research evaluating student progress in social-emotional-behavioural functioning as result of placement in a NG would benefit from the systematic inclusion of fidelity measures. Further, by informing and guiding intervention, measures of implementation fidelity could increase implementation reliability across NGs, as well as improve programme efficacy, staff training and supervision (Fixsen et al, 2005).

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