Co-creation of a narrative intervention program for speech–language pathology and educational settings

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ABSTRACT

Background: Many narrative-based intervention programs have been designed to foster narrative skills in either educational or healthcare settings. Particularly in programs that adopt a Multi-Tiered System of Supports, it is useful to involve both teachers and speech-language therapists (SLTs) in the co-creation process, since doing so will contribute to strengthening complementarity between research and educational and therapeutic practices.

Goal: The goal of the current study is to describe how an evidence-based multi-tiered multimodal narrative intervention program (MultiModal Narrative, MMN) was constructed by integrating research and real-life professional practice through a participatory co-creation process.

Methods: A total of 24 preschool teachers and 69 SLTs and three researchers working in Catalonia participated in five-session iterative co-creation process. First, the researchers presented the prototype of the research-based narrative intervention program. Then, using the Nominal Group Technique (NGT), the teachers and therapists generated a set of ideas associated with narrative-based training. These ideas were subjected to qualitative and quantitative analysis, the goal being to ensure that these practitioners' needs were accurately reflected in the prototype's design, with corrections being made when they were not. Participants then partly piloted the intervention in their respective professional contexts and provided feedback on the experience. This led to a final revision of the narrative intervention program, which was approved by all participants.

Results: Analyses of the NGT results and feedback after implementation led to a few changes in the intervention protocols but essentially confirmed the practicability of the prototype and therefore the applicability of the underlying research to real professional contexts.

Conclusions: This study aligns with the current trend in implementation science whereby intervention must be based on science but must also be informed by the contextual factors affecting those who will execute that intervention in real life. Our results underline the

importance of implementing co-creation processes that accommodate the perspectives of practitioners in a systematic way in order to improve educational and clinical outcomes.

Patient or Public Contribution: A variety of healthcare and educational professionals working with young children in the Catalan context were involved in the co-creation of the narrative intervention program presented in this study. Their contribution involved first the identification of their professional needs and practices and then the incorporation of feedback from them into the program's design following their partial implementation of it. The resulting multi-tiered MultiModal Narrative intervention program is designed to serve Catalan-speaking professionals seeking to develop the narrative skills children in either classroom or therapy contexts.

1. INTRODUCTION

Narration is the ability to generate and tell or retell a real or fictional story (Gillam & Ukrainetz, 2006). Oral narrative skills are one of the most important milestones in language development and are considered a valid and ecological measure to assess children's language development (e.g., Demir & Küntay, 2014; Duinmeijer et al., 2012; Stites & Özçalışkan, 2017). Specifically, narration abilities have a long-term impact on children's language and academic performance, especially in the preschool years, when these abilities act as predictors of later linguistic performance (e.g., Demir et al., 2015; Dickinson & McCabe, 2001; Griffin et al., 2004).

In the last few decades, a great deal of research has been carried out on how to improve oral narrative skills, with various interventions related to narrative interventions having been designed and implemented for preschool- and school-aged children as result (see Favot et al., 2021 and Pico et al., 2021 for systematic reviews). Studies have shown that such interventions can boost children's narrative skills both in classroom contexts (e.g., Khan et al., 2014; Spencer et al., 2015) and in small groups or individualized settings with children that have language or communication disorders (see, Dodd et al., 2011 and Hettiarachchi 2016 regarding group treatments; and Gillam et al., 2018; Petersen et al., 2010 for individual treatments; for reviews see Donolato et al., 2023; Favot et al., 2021; Pico et al., 2021).

Recent international educational policies have emphasized the importance of implementing multi-tiered interventions (Clark & Dockweiler, 2020; Ebbels et al., 2019), whereby the amount of support provided to a child, whether instructional or behavioral, is increased up levels of intensity (tiers) as that child's needs become more serious. This concept has been formalized into what is known as the *multi-tiered system of supports* approach (MTSS), now widely applied in education systems to ensure that all children are provided with the appropriate type and level of support throughout the different stages of their education (for MTSS as applied to the Catalan education system, see Dept. of Education, Catalan Government, 2015). What this means in practice is that children who do not receive sufficient teacher-mediated support in tier 1, the group classroom (*universal support*), may require more individualized attention provided by a therapist in tier 3 (*intensive support*) (Clark & Dockweiler, 2020; Jimerson et al., 2016). Such multi-tiered interventions also serve to interconnect and integrate the complementary work of educators and healthcare professionals.

For example, for children with language difficulties, classroom interventions related to the

development of narrative skills can be dovetailed with therapeutic interventions by speech-language therapists (henceforth, SLTs) (Archibald, 2017; Ebbels et al., 2019). However, at least as reflected in the research, narrative intervention has taken place in either the classroom (e.g., Gillam et al., 2014; West et al., 2021) or in the clinical context (e.g., Diez-Itza et al., 2018; Gillam et al., 2018; see Favot et al., 2021 for a review), with little attention paid to the relationship between the two domains. To our knowledge, only two narrative interventions have been designed that adopt a multi-tiered approach, namely Spencer and Petersen's (2018) *StoryChamps* intervention and the *NELI* intervention described in Snowling et al. (2022).

When designing multi-tiered interventions that can be successfully implemented in both educational and health settings, it is important to take into account the perspectives of professionals working in each of these fields—whether practitioners or researchers—and involve them in the design process (Dollaghan, 2007; Ocloo & Matthews, 2016; Peters et al., 2013). A recent sytematic review of health and social research has shown that involving other stakeholders like patients and even the general public can help to make research outcomes more applicable and novel interventions more rapidly accepted (Brett et al., 2014).

Public involvement in designing interventions can be conducted at different levels, such as identifying and prioritizing users' needs and priorities (e.g., Clemensen et al., 2017; Giacco et al., 2023; Rankin et al., 2016) or piloting early versions or prototypes of the interventions in different phases, ensuring that the intervention is adoptable and feasible (e.g., O'Cathain et al., 2019). Participatory research is especially common in healthcare research (Clemensen et al., 2017) to inform the development of innovations using qualitative and quantitative data. However, this practice has not been extended to the creation of health and educational interventions for preschool children.

The main goal of this article is to describe the design and construction of an evidence-based multi-tiered narrative intervention program (MultiModal Narrative, MMN) by integrating evidence from research and the real-life expertise of working professionals from the domains of education and speech-language therapy. This program was developed based on a participatory co-creation process that involved three groups: the researchers who developed the prototype of the program, a group of preschool teachers and a group of SLTs, all active professionals working in the Catalan educational and/or healthcare context. The site is of significance, given that to date most narrative intervention programs have been implemented and validated in English-speaking regions; by contrast, Catalonia lacks scientifically validated

and multi-tiered narrative programs aimed at Catalan-speakers, despite the fact that Catalan is the vehicular language of the education system.

2. METHODS

2.2 Participants

The participants in this study were 24 preschool teachers and 69 therapists in fields related to speech-language pathology or psychology, all of them living and working in Catalonia, Spain (see Table 1). Using a snowball technique the teachers were recruited from public schools, while the SLTs were recruited from public centers for child development and early care, public support services for children with special hearing or and language needs, and private speech-therapy centers.

Table 1. Participant characteristics

	Number of participants (%)	
	Teachers	**Therapists**
Gender	Female: 23 (95.8%) Male: 1 (4.2%)	Female: 67 (97.1%) Male: 2 (2.9%)
Profession	Preschool teacher: 24 (100%)	Speech-language therapist: 52 (75.4%) Specialized language teacher: 6 (8.7%) Speech-language therapist and psychologist: 4 (5.9%) (Neuro)psychologist: 3 (4.4%) Psychopedagogue: 3 (4.4%) Audiologist: 1 (1.2%)
Employing institution	Public preschool: 24 (100%)	Public support service for children with hearing and or language needs:

		49 (46.2%) Private speech-therapy service: 11 (11.8%) Public center for child development and early care: 9 (9.7%)

2.3 Procedure

2.3.1. Development of the MMN prototype

Prior to the involvement of participants, basing themselves on existing narrative-based interventions, the authors of the study had designed a multimodal narrative intervention intended to foster the development of preschool children's narrative skills. Previous studies in the field have shown the value of using verbal techniques such as question-and-answer sequences to reinforce a child's understanding of narrative structure and offering positive verbal feedback on an child input. Other studies have highlighted the benefits of using complementary (audio)visual materials to represent or clarify narrative content or structure.

A second body or research has suggested that oral narration training should be systematically linked to multimodal communication, understood as the use of hand gestures, facial expressions, body movements and prosody to accompany the verbal message of speech (Perniss, 2018). Both teachers and therapists naturally use multimodal cues when they produce narratives, and indeed there is already research showing that multimodality can be beneficial for narrative skill training for children (e.g., Demir et al., 2014; Nicolopoulou et al., 2015; Vilà-Giménez & Prieto, 2021).

The researchers were also motivated by the positive outcomes of two studies that integrated pragmatics into narrative-based interventions (Dodd et al., 2011; Pronina et al., 2021). The findings of these studies indicated that children can be trained not only to decode the verbal and gestural messages produced by a speaker but also to interpret a speaker's emotions and perspectives.

Finally, as noted in the Introduction, we sought to make the design of the MMN prototype compliant with current policies promoting MTSS, ensuring that all children receive the support they need.

These four areas, which can be viewed as the theoretical foundation pillars for the MMN training program prototype, are illustrated schematically in Figure 1.

Figure 1. The four domains of the research-based framework underlying the prototype MMN intervention program

2.3.2. General design of the collaborative training sessions

The five-session co-creation process[1] was intended to familiarize the 93 participating practitioners with the MMN prototype, gather input from them regarding their own practices and needs regarding narrative skills training for children, incorporate that input into the prototype, have them trial the revised prototype in their respective professional contexts and then again incorporate their resulting feedback into a final, formalized program which would be fully in tune with real-life intervention practice. Participants were grouped into three groups, one of them consisting only of teachers and the other two comprising roughly equal numbers of therapists. Thereafter the groups worked separately but in parallel.

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[1] The sessions were offered as a short course entitled 'Let's improve oral narrative abilities during preschool years: An inclusive multimodal intervention program for boosting oral abilities' under the auspices of the Catalan Government's Department of Education.

The five sessions making up the co-creation process took place as monthly two-hour Zoom meetings between October 2021 and March 2022. Two researchers were present at each session: the first author led all sessions, the second author attended all sessions of the group of teachers and the third attended all sessions of the two therapist groups. The use of Zoom made it possible to include participants from all over Catalonia, and also Zoom's "breakout room" feature allowed for smaller group discussions. The materials for each session were created by the three authors and were reviewed by two members of the Catalan Education Department who were experts in preschool multi-tiered interventions.

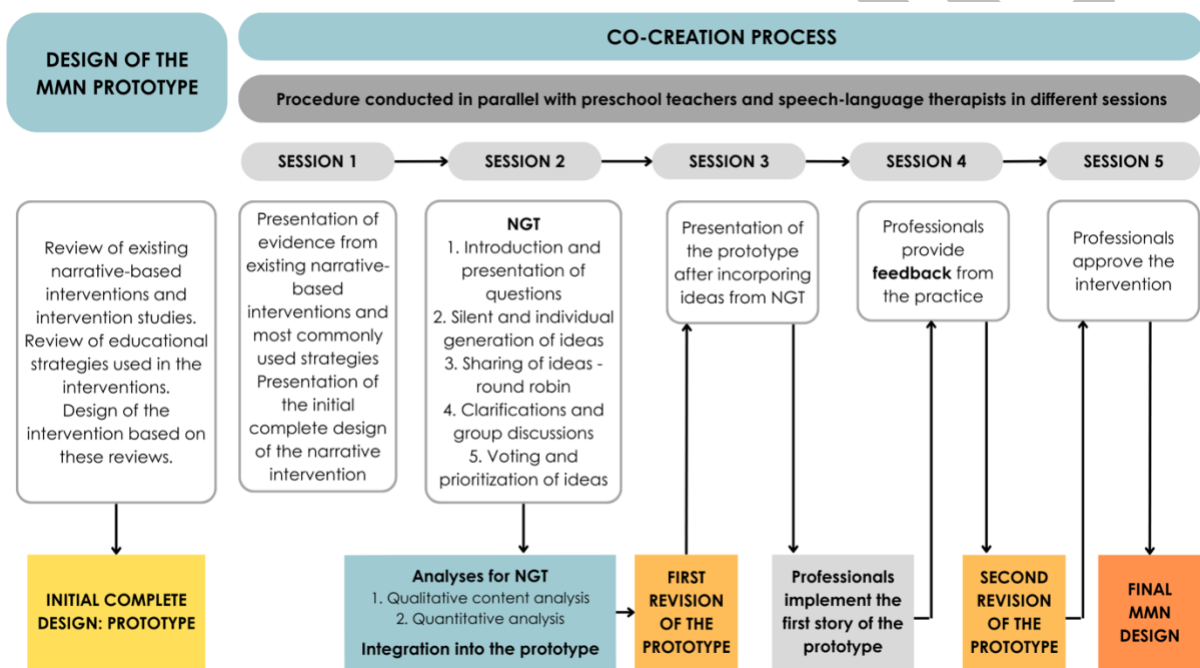Figure 2 shows a schematic diagram summary graph of the 5 five-session co-creation process.

Figure 2. Summary graph of the procedure followed during the two 5-session co-creation processes

2.3.2.1. Application of the Nominal Group Technique (NGT) and first revision of the MMN prototype (sessions 1 and 2)

The first session was used to review the state of the art in research on narrative-based interventions and then present in detail the prototype for the muli-tiered MMN intervention. The second session was devoted to gaining an overall understanding of the practices and needs of participating teachers and SLTs concerning narrative training in the children with whom they were working. The methodology applied to do so was a modified version of the Nominal Group Technique (as per Rankin et al., 2016). NGT is a structured procedure designed to first obtain a wide range of input from a group of people regarding a particular issue or problem to

solve and then arrive at a consensually agreed set of solutions. Unlike a simple group meeting, NGT enables active participation by all participants (Mullen et al., 2021). This technique has been shown to be an effective method to systematically obtain group agreement in participatory research (e.g., Harvey & Holmes, 2012).

In the present instance, the implementation of NGT in session 2 followed a systematic step-by-step process. First, smaller subgroups of (max. 12) participants were randomly created, resulting in two teacher subgroups and five therapist subgroups. For each subgroup, the first author served as the session's chairperson, guiding the session. The second or third author (depending on the group) acted as a secretary by noting down all ideas that were expressed in the session. The set of questions to be addressed are displayed in Table 2.

Table 2. Questions presented during the NGT session

1. How do you train oral narrative and pragmatic skills in your professional context?
2. What are your needs with regard to training children in oral narrative skills in your professional context?
3. What are your needs with regard to training oral pragmatic skills in your professional context?
4. What would you need in order to make narrative interventions beneficial for all children (regardless of whether they have special needs) considering the participation of different professionals?
5. What would you need in order to make narrative interventions more effective?

After the questions were posed by the chairperson, members of the subgroup were given roughly eight minutes in which to reflect silently any ideas they had in response to the questions, without indulging in any interaction with other members of the subgroup. When all participants were ready, members took turns in round-robin fashion expressing just one of the ideas they had noted down. Each turn was kept completely free of interaction with other participants. Once each member had spoken once, expressing their first idea in connection with the question, a second round was carried out during which members had a chance to express a second idea. This procedure continued until participants confirmed that they had expressed all their ideas related to that question. Then the round-robin presentation of ideas process was applied to the next question, until all five questions had been dealt with, the full process lasting

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around an hour. Throughout, the other researcher (secretary) took notes, listing all ideas for each question on a digital document shared with the group via the Google Docs platform. This was followed by a 15-minute period in which participants could ask other subgroup members to clarify an idea they had put forth. Finally, participants were asked to reread the document prepared by the secretary and then, working individually, rank the three most important ideas for each question listed on Google Forms. This activity took roughly 15 minutes. The session ended with a 15-minute discussion during which the two researchers showed the combined results from the ranking activity (automatically generated by Google Forms), the goal being to reach a group consensus on the three most important ideas related to each focus question. Based on these ideas, the first revised version of the intervention prototype was prepared.

2.3.2.2. Trial implementation of the intervention and second revision of the MMN prototype (sessions 3, 4 and 5)

The third meeting of the subgroup was devoted to presenting the first revised version of the MMN prototype. At the end of the session, participants were asked to carry out a partial implementation[2] of the MMN intervention with the children they were working with at that time in their respective professional settings. Importantly, participants were asked to voluntarily video-record themselves while implementing each session and also note down all their reactions after the session was over.

The fourth meeting centered on sharing and discussing feedback from participants about their experience of implementing the MMN intervention in their professional setting. First, participants were split up into small groups of four or five in which they shared impressions from having trialed the MMN intervention and were then asked to assess their experience in terms of whether the intervention had addressed the needs they had mentioned during the NGT session. After the small-group discussion, the larger group was formed again and feedback from the small groups was shared, the secretary meanwhile taking note of all that was said. These notes were subsequently analyzed by the researchers and the main ideas expressed were incorporated into the second revision of the MMN prototype.

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[2] The full MMN training program consists of nine sessions. Each group of three sessions centers around one cartoon story. In the trial implementation referred to here, participants were asked to work with only one of three stories, in other words, to conduct only three sessions.

Finally, the fifth and last session consisted of a detailed presentation of the final revised MMN program for final validation by the professionals (a full description of the MMN training program appears in **** et al., under review).

2.4 Data analyses

Data analyses were conducted of the NGT data and the professionals' feedback after they had piloted part of the MMN intervention, leading to the first and second revisions of the MMN prototype, respectively.

2.4.1. Analysis of NGT data

The data from the seven NGT groups were analyzed qualitatively and quantitatively using a three-step procedure (see Figure 3). It will be recalled that the NGT process yielded a document listing the three most-voted ideas for each of the five questions and for each of the seven NGT groups. Further analyses of this data were conducted by grouping separately the two groups of teachers and the five groups of SLTs. This resulted in a total of 44 ideas proposed by teachers and 93 ideas proposed by SLTs.

Figure 3. Procedure followed to analyze the data from the application of the Nominal Group Technique (in the top-most rectangle, "ties" refers to the fact that often several different ideas received the same number of votes in the ranking process)

Qualitative content analysis

A qualitative analysis of these 137 ideas was carried out by the first and third authors following the procedure proposed by Graneheim and Lundman (2004) and Wallace et al. (2017) with the goal of distilling the ideas into a synthesized overall list broken down by thematic content. The procedure consisted of two main steps. First, each idea (i.e., meaning unit) was pared down into a *reduction* (i.e., a concise summary without interpretation) and then situated within a narrow *subcategory* (i.e., reduced and condensed meanings of the units including an interpretation of its underlying meaning) and a broad thematic *category* (i.e., a wider level of interpretation connecting the meanings expressed by multiple subcategories) (see Figure 3 for an example). The second step involved the coding of themes (i.e., a greater interpretation of the categories that acted as general labels for the meaning units). Importantly, to simplify the interpretation of ideas, themes were defined as if they were a response to the question "What is it important to consider in the design of a narrative-based intervention?". Throughout the process, to ensure the rigor and trustworthiness of the qualitative content analysis, the two authors consensualized their definitions of categories and themes (see Appendices I and II) and revised the coding process. Also, it was decided that a category or theme should not be generated unless it was represented by at least three separate ideas.

Quantitative analysis

The seven lists of ranked ideas generated by therapists and teachers were combined into overall lists, one for therapists and one for teachers, and then subjected to quantitative analysis by calculated the frequency of occurrence of each item.

2.4.2. Analysis of professionals' feedback

As described above, the feedback provided by participants in session 4, after they had piloted the first revised version of the MMN prototype, was noted down during the session by the secretary in each group. These notes were subsequently discussed by the three authors meeting together for the purpose of using that feedback to make further changes in the design of the MMN prototype.

3. RESULTS

This section reports the results from the qualitative and quantitative analyses of the NGT sessions and the analysis of feedback provided after the pilot implementation of the MMN intervention. In each case, presentation of the results is followed by an explanation of how these results were used to make changes in the MMN prototype.

3.1. First revision of the MMN prototype based on NGT data

The qualitative and quantitative analyses of the NGT data were carried out separately for teachers on the one hand and therapists on the other. The 44 ideas generated by teachers were classified into 59 subcategories and 15 categories. The latter were then grouped into four overarching themes. These themes and their constituent categories can be seen in Table 3, along with a few examples of meaning units (i.e., ideas) for each category. In like fashion, the 93 ideas expressed by the therapists were classified into 118 subcategories and 20 categories. The categories reflected the same four themes, as can be seen in Table 4.

Table 3. List of themes and categories extracted from the qualitative content analysis of the NGT data from teachers, with examples of meaning units. Gray-shaded categories were present in data from both teachers and therapists.

Themes	Categories	Examples of meaning units
Strategies to promote oral linguistic abilities	Oral interaction	• We generate oral interaction about children's stories. • Children tell stories to their classmates.
	Linguistic modeling	• We train story-retelling using repetitive and similar structures, modeled by the teacher. • We use intonation, changes of voice, facial expressions.
	Socioemotional abilities	• There is a need to train children to understand and interpret the emotions of others as well as to express their own emotions. • There is a need to train children to put themselves in someone else's shoes.
	Oral discourse during structured activities	• Children tell stories through the activity called "Storybook Corner". • We train daily routines.

	Discourse about personal stories	• We promote the generation of narratives about personal experiences. • We retell our stories.
Materials and programs to train oral narration	Structured and contextualized programs	• There is a need for validated, diverse and modern materials in Catalan. • It is essential to have clearly defined goals.
	Material resources	• There is a need for resources aimed at children with special needs. • There is a need for innovative materials and resources.
	Use of storybooks	• Children tell stories through the activity called "Storybook Corner". • Children take storybooks home to read with their families and then retell the story to their classmates.
Diversity among children must be accommodated	Child involvement	• We need activities that catch children's attention. • We need activities that increase children's motivation.
	Diversity of oral needs	• There is a need for materials that are appropriate for children with language-learning difficulties. • Some children have difficulty with speech production and communication.
	Personalization	• We need to have smaller class sizes. • There is a need for validated, diverse and modern materials in Catalan.
Professional concerns related to resources and working conditions	Time resources	• More time is needed to plan and organize interventions.
	Coordination	• Very clear planning and goals are necessary for teamwork or co-teaching. • We need to agree on how to implement interventions and share materials.
	Specialist resources	• Need to have a specialist referent giving support to difficulties. • There is a need for more support from specialists such as speech-language therapists.
	Training	• We need more training about linguistic diversity, language difficulties, multilingualism, and social problems.

Table 4. List of themes and categories extracted from the qualitative content analysis of the NGT data from SLTs, including examples of meaning units. Gray-shaded categories were present in data from both teachers and therapists.

Themes	Categories	Examples of meaning units
Strategies to promote oral linguistic abilities	Oral interaction	• I promote conversation with questions. • I use interactive retelling of stories and temporal sequences; for example, I start the sentence or story and the child finishes it.
	Linguistic modeling	• I use retelling and modeling. • I tell a story using simple and clear structures.
	Socioemotional abilities	• I use stories that take into consideration Theory of Mind, which implies being able to assign feelings to characters and comprehend different perspectives.
	Visual materials	• I use visual materials such as storybooks, pictures, personal photos or short films. • I use picture sequence to model narrative structure.
	Manipulable materials	• I use materials that can be manipulated like puppets or playmobil toys. • I promote symbolic play.
	Enactment	• I promote enactment of the story with puppets. • I promote enactment of stories from the child's context.
Materials and programs to train oral narration	Structured and contextualized programs	• There is a need for permanently available programs or packages of programs. • There is a need for specific and structured methodologies to train oral narration.
	Material resources	• There is a need for attractive resources aimed at different levels. • There is a need for resources that will enable us to evaluate the progress of the child.
	Use of storybooks	• I tell stories using visual materials such as storybooks. • I promote the enactment of storybook stories using puppets.
	Resources in Catalan and Spanish	• There is a need for materials adapted to Catalan. • There is a need for materials in Catalan and Spanish, either newly created or validated adaptations of materials in English.
	Generalization	• Children need to be shown how generalize to the real context and functionality. • Children need to learn to benefit from all the enriching contexts of daily lives such as positive interactions.
Diversity	Child involvement	• It is difficult to motivate children.

among children must be accommodated		• There is a need for more activities that guarantee active participation, either individually or in groups.
	Diversity of oral needs	• There is a need for more materials adapted to children's particular needs. • There is a need for sequencing in materials to reflect differences in learning.
	Personalization	• There is a need for materials that address all linguistic stages. • I use photo albums.
	Evaluation	• There is a need for continuous evaluation measures that can be used in each session to assess the child's needs. • It is necessary to evaluate pragmatic abilities in a more systematic way to detect which difficulties need to be prioritized.
Professional concerns related to resources and working conditions	Time resources	• I need more time to organize and prepare materials. • I need more flexibility in my schedule and time to think.
	Coordination among adults	• There is a need for coordination among all those adults that are in contact with the child. • There is a need for support from other colleagues such as teachers, speech-language therapists or psychologists and better teamwork.
	Participation from families	• I need for more cooperation from the children's families. • Children's families need to be empowered by adopting the strategies they have at home.
	Participation from professionals at schools	• There is a need for greater cooperation and coordination between teachers and language specialists at schools. • I need to be able to coordinate with teachers to link what I do with what they do in class.
	Access to classrooms	• I need to be able to intervene in the classroom for short periods. • It is difficult to gain access to classrooms.

As represented in Tables 3 and 4, the theme entitled "Strategies" included three categories that reflected concerns common to both teachers and therapists, which included the importance of integrating oral interaction into the intervention setting, linguistic modeling strategies involving repetitive structures and strategies for fostering awareness of emotion comprehension, such as understanding the emotions of characters and then generalizing them

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to their own emotions. However, the two groups of participants did not overlap with other categories connected with their habitual practices. Thus, while teachers highlighted their use of storytelling, reading books and retelling their contents, or recounting personal experiences, therapists mentioned specific support materials and strategies, such as pictures, puppets or story enactment.

The "Materials and programs" theme also included three shared categories. Both groups of professionals said that they habitually used storybooks to promote oral narrative discourse. They also both mentioned a need for programs with clearly defined aims and specific methodologies as well as modern and attractive material resources tailored for children with different needs. Apart from these, however, therapists' comments reflected two additional categories: the need for materials that were in Catalan or in both Catalan and Spanish, and the recommendation that these materials should be generalizable to other settings in the child's daily life such as their family.

The "Diversity" theme included another three shared categories, all connected with the need to motivate children and encourage them to actively participate in activities, which might involve being able to personalize materials and activities that take into account children at different learning stages. The therapists also highlighted their need for evaluation methodologies that could help them identify children's needs and adapt interventions accordingly.

The fourth theme, "Professional concerns", also showed overlap. Both teachers and therapists felt that they needed more time to plan and prepare intervention sessions. Both groups also asked for better coordination, although teachers referred to coordination with other teachers at the school whereas therapists referred to coordination among all the adults who were involved in the lives of the children, including their parents. There was no overlap of teacher and therapist concerns in the remaining categories. SLTs expressed a desire for a higher degree of collaboration with children's parents and their teachers to ensure that all were working towards the same aim. They also said that they needed to be able to access the classroom to work with the children in that context as well as in the therapy context. For their part, teachers pointed out their need for more specialized professionals to help them cope with the diversity of children's needs they confronted. Teachers also mentioned a desire for more training to help them address this diversity themselves.

The results of our quantitative analysis of the ideas presented in the NGT can be seen in Figure 4. The ideas are grouped into the four overarching themes and displayed in two separate

columns, one for each participant group. Frequency of occurrence—i.e., the number of times a particular idea falling within that theme was ranked as one of the top three priorities by a participant—is expressed as a percentage of the total number of ranked responses for that group. Interestingly, the results highlight a set of differences in the weight of the different themes across the two groups of professionals. First, for each group of professionals, two different themes accounted for more than 50% of occurrences. While teachers prioritized ideas that were related to the themes "Diversity" (37%) and "Strategies" (32.5%), therapists prioritized needs that belonged to the themes "Materials and programs" (34.6%) and "Professional concerns" (33.2%).
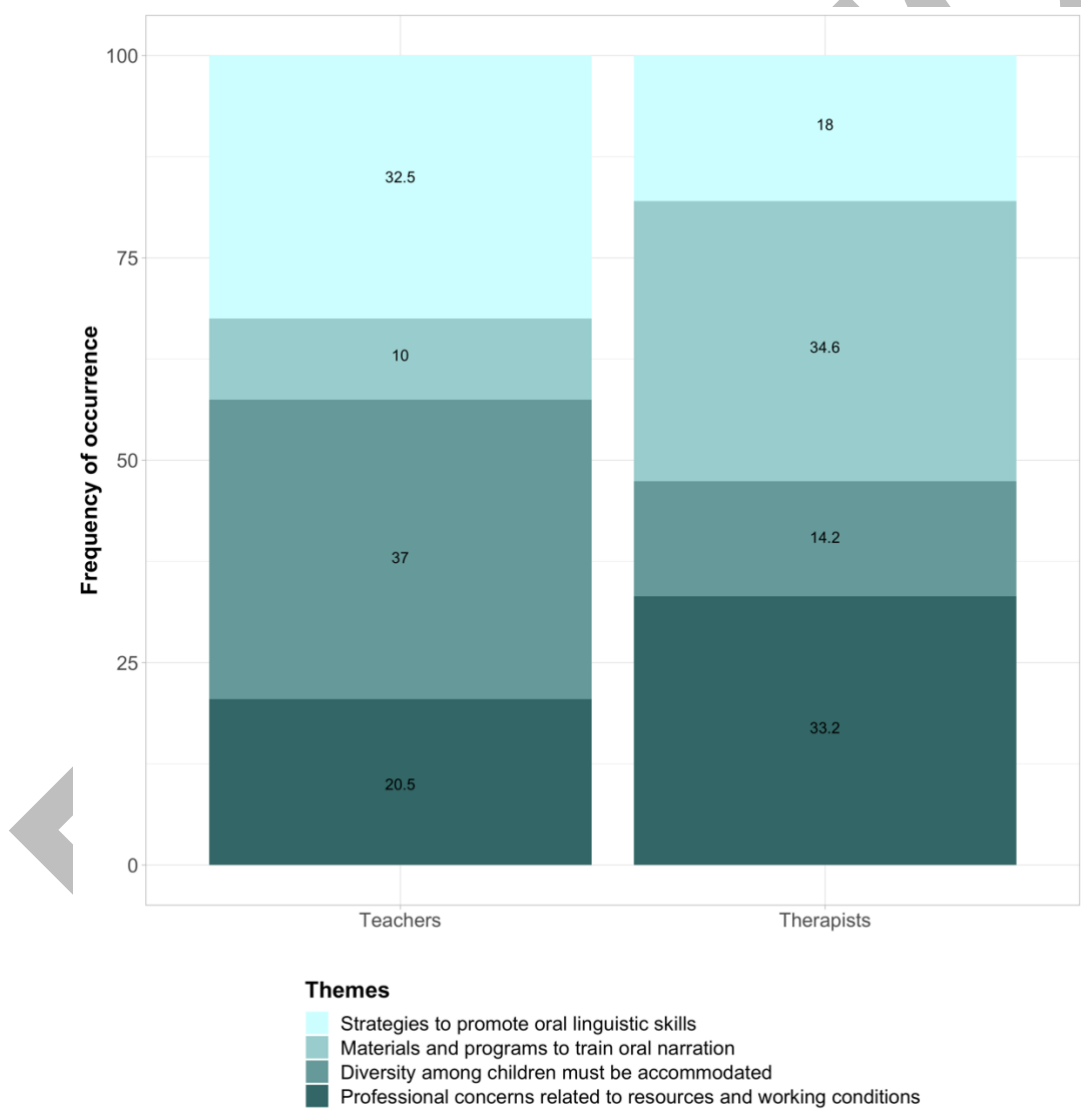

Figure 4. Frequency of occurrence of each theme expressed as a percentage, broken down by group

Incorporation of NGT findings into the MMN program

The NGT process revealed that the majority of participants' needs had already been accounted for by one of the four theoretical pillars underlying the MMN intervention prototype (see Figure 1). For example, there was substantial overlap between what the research on narrrative-based interventions had to say and ideas expressed by teachers and therapists within "Strategies", such as the importance of verbal strategies like using short, structured and repetitive sentences within a structured activity setting or complementary audiovisual materials like pictures or short films. Additionally, they made reference to training children to understand and express emotions and perspectives of the characters in narratives, which is consistent with the literature on the role of pragmatics. As for multimodality, professionals also talked about the use of gestures and prosody, as well as story enactment activities, all of which can help to keep children engaged in a narrative-based activity. Regarding the element of inclusion built into the MMN prototype through its multi-tiered design, this is clearly in tune with participants' expressed concern with transversal coordination between the classroom and therapy contexts, as well as their interest in tailoring their work for children with special needs. Finally, there were a few other areas of interest to participants which were accommodated in our design, such as the incorporation of sessions where children could talk about personal experiences to help them generalize concepts, or having validated intervention materials in Catalan.

That said, the NGT findings did serve to show us where certain adjustments to the prototype should be made. First, in the prototype version of the MMN, a set of still pictures were used to represent the main structural and emotional elements of the story. However, on the basis of input from participants through the NGT, we decided that it would be more effective to use animated GIFs (as opposed to a static image that did not capture movement) for this purpose to ensure that the whole action or emotion was visible. Second, as SLTs highlighted the need for materials to help them evaluate children's learning process, we incorporated a set of short learning measures into the MMN procedure which would allow professionals to measure the child's comprehension and retelling abilities after each intervention session.

Finally, some categories could not be addressed in the first revision of the intervention, mostly falling under the "Professional concerns" theme, given that these were needs that were outside the scope of the intervention, such as time resources or training. However, the fact that professionals were participating in the sessions and were receiving instructions on how to implement the intervention, and the fact that, in the end, they would be able to implement the

finished version of the intervention would help to reduce the amount of time required to prepare the intervention. Also, the multi-tiered nature of the MMN training program would presumably address the need for greater coordination between professionals.

3.2. Second revision of the MMN prototype based on the pilot implementation

Based on participants' feedback after the implementation of the first revised version of the prototype a total of six important changes were made to the design and procedures of the MMN prototype. First, it should be considered that the MMN program was designed in two versions, the tier 1 (universal support), and the tier 3 (intensive support). It was clear that the changes to be incorporated following the trial implementation by teachers and therapists might involve different adjustment to the respective prototypes.

Nonetheless, there were two important changes—both affecting the structure of the intervention sessions—that were applied to both variants of the prototype. First, while the initial design included one 50-minute session per story, with a final task within that period involving personal story generation, both teachers and SLTs reported that the children undergoing the intervention found it too tiring to cover so many tasks during the same session. For this reason, we decided to add to the program a new session that was exclusively devoted dedicated to the generation of personal stories. Second, when we viewed the video-recordings of participants implementing in the intervention, we realized that professionals did not only use multimodal strategies for enacting the story, but that it was natural for them to produce some gestures to represent the story icons. Therefore, we decided to systematically incorporate these naturally produced gestures in the intervention.

Two major changes were applied only to the tier 1 (universal support) of the MMN training program. First, according to the original intervention protocol, the enacted sequential retelling of each story was to be executed using a repetitive structure, such that the teacher first asked and answered the questions herself to provide a linguistic model to the children, and then asked the same questions again but this time having the children answer. However, teachers who had piloted the intervention reported that this procedure was unnecessarily repetitive. The protocol was therefore changed to eliminate the first part: in the final protocol, answers to questions would be provided immediately and only by students. By contrast, the original sequence was maintained in the version of the program intended for tier 3 (intensive support), since the

procedure received the full endorsement of the participants who had piloted it. The second change made to only the tier 1 of the program was the integration of a drama-based activity. One of the activities intended to train children in story retelling was to have pupils retell the story in pairs at the end of each intervention session. However, teachers who had piloted the intervention reported that many children struggled to work in pairs and that it was consequently difficult to manage the activity. For this reason, an entirely new session was added to the intervention program; entirely devoted to a guided dramatization of the story in which children not only retold the story but also enacted it.

Concerning the tier 3, two main changes were effected. First, the enacted sequential retelling activity was carried out over two sessions, so that in the first session the focus was on the first half of the story, while the second session was devoted to the second half of the story. This addressed a concern expressed by therapists after piloting the protocol that the intervention needed to be more slowly paced to ensure that children were able to identify all the story elements. The second change involved the adoption of the SLTs suggestion to have parents send photos of the child and their families, where the photo would serve as a stimulus for personal story generation.

After all the above changes had made to the two variants, therapists and teachers approved the resulting final versions of their respective variants of the MMN intervention program (for a full description of the MMN program in their final form, see **** et al., under review).

4. DISCUSSION AND CONCLUSIONS

The current study presented the methodological procedures applied and the results obtained during an iterative participatory process consisting of five sessions that involved a group of 93 teachers and SLTs working in the Catalan education and health system, and a team of researchers. To our knowledge, this study is the first to incorporate input from professionals in the design of a multi-tiered narrative-based intervention by means of a participatory co-creation process.

The results of this endeavor confirm the value of such co-creation processes for the design of healthcare or educational interventions because they ensure the systematic integration of professionals' needs with research evidence. More specifically, systematic analyses of the professional needs of participants and the feedback they provided allowed us to produce two revised versions of the initial prototype of a narrative intervention program intended.

As a tool to elicit maximally representative consensus views from a group, the NGT model proved its value here, yielding from a set of common concerns and needs between the two groups of professionals, as well as differences. This result is consistent with previous research showing the practices of professionals dealing with children who have special language needs will vary depending on the context or the professions (Girolamo et al., 2022; Selin et al., 2022). The input from professionals was useful in two ways: it allowed us to identify and correct weaknesses in the design on the MMN intervention, but it also reassured us by confirming that overall our research-based design had already addressed most of the concerns voiced by the professionals.

The final revision of the MMN program was based on input from the professionals after they had trial-implemented part of it. This led to two changes in the protocol that applied to both tier 1 and tier 3 variants of the intervention, as well as changes that affected only one or the other. One common change involved the addition of a separate session in the program specifically devoted to training children to recount personal stories; the other involved enriching the protocol by supplementing the multimodal features of the program with gestures that professionals had naturally employed when retelling narratives. With regard to changes affecting the tier 1 and tier 3 variants, while teachers claimed that the intervention protocol would be improved by having fewer repetitive activities and more engaging ones, such as guided dramatization, SLTs were satisfied with degree of repetition and linguistic modeling for children with difficulties prescribed in the protocol, as it was consistent with the needs of

children with special difficulties. These changes significantly enhanced the final design of the MMN training program, although the key research-based educational strategies remained intact, having proved their worth in real-life professional practice.

The process of co-creation exemplified here is in consonance with recent guidelines for successful participatory research and the finding of implementation science (e.g., Brett et al., 2014; Peters et al., 2013; Clemensen et al., 2017). As Boaz et al. (2018) suggest, there is a need to incorporate engagement within the research production framework, so that the gap between research production and actual research use is narrowed. This is crucial, given the fact that an intervention can be designed on a robust theoretical foundation, yet turn out to be inappropriate or unfeasible for a specific context.

One aspect of the co-creation process that particularly caught our attention was the positive attitude towards it by the participating professionals. For most of them this was the first time that they were able to actively engage in a research project, and they reported being highly motivated by the fact that this intervention was intended to address their professional needs. Nevertheless, this cross-disciplinary collaboration did entail certain challenges. First, as Brett et al. (2014) mention, the goals and perspectives of researchers and practitioners do not always coincide. This was apparent on occasion in the course of this study when, for example, differences arose regarding the use of certain scientifically validated educational strategies. For instance, the use of wordless animated cartoons was initially surprising for some participants, who had only used voiced cartoons in their professional practice. The fact that, in the MMN intervention, children are first exposed to cartoons was a deliberate choice derived from our belief that children would benefit from being exposed to the story without having the burden of coping with a linguistic element. Another focus of diverging views was the use of the question-and-answer sequence during retelling activities. Several participants balked at this technique because they felt it was important to produce a full narrative. Discussion with peers and researchers, however, helped them realize that such question-and-answer techniques facilitated children digesting of the story content and structure and the interactive element heightened their engagement in the activity. Finally, it should probably be noted the online modality of the group sessions may have had an impact on the participatory process: for some participants, being seated in front of a computer screen was not conducive to acting out stories or simulating their performance in the intervention session. These challenges notwithstanding, on balance the co-creation process was regarded as positive and beneficial both by professionals and researchers.

The outcome of this process was the multi-tiered MMN intervention program in Catalan. That program has since been subjected to a feasibility study as well as an additional small-scale trial implementation (the results of both are reported in **** et al., under review). We believe that having initiated the design of MMN in a participatory fashion helped ensure positive results in these subsequent studies.

In sum, the results presented in this study highlight the importance of public involvement in the development and implementation of novel research-based educational and healthcare interventions, particularly in the early stages of design. Our study further contributes to current implementation science by emphasizing the importance of bridging the gap between research evidence-based intervention design and real educational and clinical practice (e.g., Brett et al., 2014; Dollaghan, 2007; O'Cathain et al., 2017). In our view, adopting participatory research guidelines from the start has the potential to make health and educational interventions more impactful, as they will be add value not only to the body of research but also the real working world of practitioners and end-users.

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