Differences in phonological awareness of five-year-olds from Montessori and regular program preschool institutions

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Abstract

Montessori preschool program (MPP) is a structured program that incorporates metalinguistic exercises, which are implemented even before children reach four years of age. In contrast, in regular preschool programs (RPP) in Croatia, activities related to the development of reading and writing skills are provided only to older children. Also, unlike MPP, these activities in RPP are isolated from the context of the general activities and play, which is contrary to the knowledge that child development should be approached holistically. Accordingly, in this study, we wanted to test the assumption that children attending MPP will have a more developed phonological awareness than RPP children. Phonological awareness is a metalinguistic ability related to the acknowledgement of the sound components of speech and it is a significant predictor of later language skills. The sample comprised 60 children of regular language and cognitive development from MPP (M=5.21, SD=0.17 years) and RPP (M=5.23, SD=0.18 years). In each group there were 15 girls and boys. Testing was performed using FONT-HR (Cronbach α=.97). The results showed that, as expected, MPP children had a greater phonological awareness (M=43.30, SD=7.89) than RPP children (M=31.23, SD=9.99). The difference is statistically significant and of large effect size: t(58)=5.19, p<.001, d=1.34. Also, there were no gender differences: t(58)=-0.05, p=.96, d=0.01. While it is necessary to conduct additional studies in order to statistically control for the factors such as intelligence, these results suggest a possibility that language exercises approach from MPP is superior compared to RPP. Therefore, adoption of MPP language activities concept could have a positive effect on the (early) reading skills of children from RPP.

Key words: early literacy; holistic approach to education; language exercises; metalinguistic abilities; structured didactic play

Introduction

It is well understood that the child development is a holistic process, meaning that different domains such as cognitive, physical and motor, and social and emotional operate and develop simultaneously (Lasi, Nadeem, & Fatima, 2007; Slentz, Krogh, 2001). Based on this fact, it is generally recommended that children early learning and curriculum should be organized in an integrated, holistic manner (Boyd, Barnett, Bodrova, Leong, & Gomby, 2005; French, 2007; Nadeem, Maslak, Chacko, & Hoagwood, 2010). Furthermore, it has been suggested that play is especially important from the developmental point of view (Ginsburg, 2007; Gray, 2013) and that it has a major role in early learning processes (Gray, 2013; Looney, 2004). Given that “language is a major vehicle for learning” (Looney, 2004, p. 19) and that language acquisition is highly influenced by social interactions (Kuhl, 2004), it is not surprising that language, learning, play (in various forms), and the child development in general are highly functionally interrelated (e.g., Ervin-Tripp, 1991; Owens, 2012). This implies that childhood language learning and early literacy are particularly complex and that the activities related to their acquisition and facilitation should probably closely follow the principle of holistic organization.
Given the obvious fact that large numbers of children spend a significant amount of time in preschool and kindergarten settings, we will limit the argumentation on that particular aspect. While the existing body of research is still lacking a sufficient number of long longitudinal studies (Chambers, Cheung, Slavin, Smith, & Laurenzano, 2010), several things seem to be clear. Specifically, research syntheses suggest that preschool and kindergarten intervention programs generally do positively affect children’s development of early and emerging literacy skills, and they do seem to be effective in preparing children for school (Lonigan & Shanahan, 2008). Furthermore, levels of early language and literacy skills (i.e. from preschool and kindergarten) strongly predict child’s future academic success (Chambers et al., 2010; Trehearne, 2011). But, most importantly, data from 40 studies (evaluating 28 different programs) converges on a conclusion that “comprehensive programs focused broadly on cognitive development rather than solely academic skills had better long-term effects on social adjustment outcomes such as reductions in delinquency, welfare dependency, and teenage pregnancy, and increases in educational and employment levels” (Chambers et al., 2010, p. 2).

Similarly, a meta-analysis conducted by Lonigan and Shanahan (2008) describes that the effective literacy-focused preschool and kindergarten intervention programs tend to be organized in a manner that conforms to the holistic/integrated idea. Specifically, such programs included structured language-enrichment didactic play (i.e. opportunities to engage in reading and writing in the context of play) with the addition of general development facilitating activities (e.g. motor or musical skills promoting activities).

However, despite the (previously mentioned) data showing the advantages of more holistic approaches to early education, regular/conventional preschool/kindergarten institutions typically do not apply this knowledge to a significant extent in their day-to-day curriculum. However, there are several alternative preschool approaches whose pedagogies are based around the idea of holistic child development and education. Note, however, that these approaches are not necessarily holistic in their entirety, as this is not all-or-nothing attribute, but rather a matter of degree. Some approaches simply lean towards the holistic side of a spectrum more. Amongst them, the Montessori method is probably the best known (see, e.g., Al, Sari, & Kahya, 2012; Edwards, 2002; Lillard, 2013). According to this approach, children are put in a three-year interval age-mixed classrooms filled with manipulative self-correcting didactic material (for more info and great examples of this see eg., Touze, 2012). Typical textbooks or grading are not used. Children have significant freedom to choose and self-direct their own learning activities. They are able to pick a topic of interest from the predetermined list of curriculum topics, which include math, language, music, etc. These topics are, however, tightly interconnected, e.g. if children are learning about a particular continent, region, or a country, they will not only learn about its natural resources, plant and animal life, etc., but will also hear or read stories about it, learn characteristic folk songs, dances, and so on. When a child chooses particular topic, it can follow it in an uninterrupted work (i.e. didactic play) block. At any given time, different children will be studying different topics and at varying degrees of complexity. For more details about the formal aspects of this approach and the differences from typical preschool programs see e.g. Al et al. (2012), Edwards (2002), Lillard (2012, 2013), Lopata, Wallace, & Finn (2005), Montessori (2004), and Phillips (1999).

A special attention in Montessori curriculum is given to early literacy, with children undergoing the program often learning to write and read before the age of six, following “writing to read” (Al et al., 2012, p. 6) principle. This means that children are first thought to write the letters and words (encoding), then to read them (decoding), as Maria Montessori herself observed this approach to be superior.

Literacy learning in Montessori is done with the help of various special materials. These materials encourage children to talk, name, and describe things, to build words using (often physical) letters, to read and write object names, and to express their own thoughts in writing, but also to read the written thoughts of others (Philipps, 1999). One of the most famous exam-
amples of such materials are letters on sandpaper that children can trace with their fingers, thus experiencing them using multiple senses. We observed an interesting variation of this material and its usage during our research. Specifically, in one of the visited Montessori preschools in Zagreb, we observed children being provided with the letters carved into “plates”. The letters were shown to them (visual sensing), read to them (auditory sensing), and then given to them to trace the carvings by fingers (tactile sensing). Afterwards, the children were engaged in several didactic play activities using these carved letters. Even the youngest children were participating in these activities. It has been shown that incorporating haptic (i.e. tactile-kinesthetic) and visuo-haptic activities (like the ones we described) in early literacy training enhances young children decoding skills (Bara, Gentaz, Colè, & Sprenger-Charolles, 2004).

Children in Montessori programs are also regularly participating in various metalinguistic, didactic play activities. This includes explicit phonological awareness exercises. Phonological awareness is a metalinguistic ability related to the general awareness of the sound components of speech (e.g., Rathvon, 2004). Note that phonological awareness includes both non-phonemic and phonemic components. The former includes aspects such as syllable and rhyme awareness, while the latter is usually referred to as the phonemic awareness, which is defined as “the understanding that spoken words are composed of individual sounds that can be analyzed and manipulated” (Rathvon, 2004, p. 66). Phonological awareness (but more often: phonemic awareness specifically) is usually found to be predictive for reading and spelling abilities (Rathvon, 2004). While this does not imply causality, research generally points to a conclusion that a systematic and explicit phonics instruction done at an early age is particularly effective in promoting word recognition, spelling, and reading comprehension (Armbruster, Lehr, & Osborn, 2010). Trehearne (2011) summarized the findings showing that the best predictor of early reading is the prereaders’ letter knowledge (i.e. the ability to recognize and name letters), followed closely by the ability to discriminate the phoneme sounds.

In Montessori preschools, the child’s ability to differentiate phonemes is facilitated by the use of small objects grouped in threes. The objects are selected so that the objects from the first group have a certain phoneme at the beginning of their names; the objects from the second group have that same phoneme somewhere in the middle of their name; finally, the objects from the third group have that phoneme at the end of their names. In Croatian, an example might be: k-uća, k-apa, k-osilica / lo-k-ot, Mi-k-i, lo-k-omotiva / čovje-k, vla-k, svjetioni-k. The children are asked which is the identical sound that they hear when these words are spoken. Once they correctly identify it, the educator picks the corresponding sandpaper letter, shows them to children and speaks its name. The letters are then used to build words. Paper and pen writing comes afterwards. These activities start even before the children reach the age of four. For much more detail on the Montessori literacy approach and exercise descriptions, see Philipps (1999). Various illustrative examples can also be found in Feez (2009).

In contrast to everything previously described, children from regular Croatian preschools are first introduced to letters in paper-print form (thus, a tactile component is absent) and literacy activities are typically done only with older children, i.e. children who are starting school next year (note: this would correspond to what is typically considered to be kindergarten, even though in Croatia there is no strict formal differentiation between the preschool and kindergaten). These activities typically do not include elaborated metalinguistic exercises. Rather, they usually comprise paper and pen graphomotor skills and letter writing. Thus, unlike Montessori literacy and language promoting activities, these activities in regular Croatian preschools are isolated from the context of other activities and (structured didactic) play (i.e. they more closely follow a formal school subject form).

To summarize – Montessori preschool program is based around the idea of a holistic child development, which is especially obvious from its literacy training, which includes metalinguistic (primarily phonic) activities, and multisensory approach, all of which have been shown to correlate with better early reading and literacy outcomes (as illustrated by our previously cited
sources). In contrast, regular preschool programs typically do not include or scarcely include the mentioned principles and activities. Still, research findings regarding the advantages of Montessori programs over regular preschool programs are generally mixed. For example, Lopata et al. (2005) did not confirm Montessori outperforming regular programs, others, such as Kayili and Ari (2011) did find it to be better, while some obtained inconsistent advantages of Montessori (e.g., Peng, & Md-Yunus (2014). Lillard (2012) provided a possible reason for such variability in findings. Namely, she points out that there are significant variations in fidelity, i.e. in the degree to which programs claiming to be Montessori are actually following the original Montessori pedagogy. She compared the children from high fidelity Montessori preschools (i.e. classic Montessori program), lower fidelity Montessori preschools (i.e. Montessori preschools that supplemented their programs with conventional school activities), and conventional preschools. She found out that children from high fidelity Montessori preschools outperformed other two groups in a wide range of measures.

Given that Montessori preschools are the main alternative to regular preschool programs in Croatia and given the apparent lack of similar research, in this pilot study, we wanted to compare the phonological awareness levels of children from these two programs. As the literature generally shows that phonological/phonemic awareness is a good predictor of literacy outcomes (Armbruster et al., 2010; Rathvon, 2004; Trehearne, 2011), preschools whose programs produce better outcomes on this variable have a potential to put their children in a much better position to begin with a formal schooling. Based on the holistic integration of early literacy activities and regular implementation of phonological awareness exercises in Montessori, and their lack of in the regular preschool programs, we would expect that Montessori children outperform their regular preschool programs counterparts.

**Method**

***Participants***

The sample comprised 60 5-year-old children of regular language and cognitive development (as per their preschool teachers’ and/or psychologist/pedagogist subjective assessment) from two Montessori preschools (M=5.21, SD=0.17 years) and two regular preschools (M=5.23, SD=0.18 years) from Zagreb, Croatia. The groups were of equal size (i.e. 30 each), having 15 girls and boys per group. We used a convenience sampling, i.e. we simply tested currently available children of the target age, for which we were able to obtain parents’ consent. All of the included children’s parents self-identified as being of the average socioeconomic status. Furthermore, while we were unable to control this in any systematic manner (the info was obtained via an informal questioning), none of the parents (or preschool teachers) reported that the included children were subjected to any extensive literary exercises at home.

Note that following the implications of Lillard (2012), testing was done only in Montessori preschools that were judged as fairly highly fidelity, i.e. those that conformed to the original Montessori pedagogy to a high extent.

***Instruments***

Phonological awareness was assessed using a Croatian adaptation of the FONT test (Subotić, 2011). The original test comprises seven subscales. However, we adopted the unpublished 2.0 version which comprises eight subscales. The adaptation was labelled as FONT-HR. The reliability of the FONT-HR was excellent, with Cronbach α=.97. Relying on the findings and recommendations of the original version of the test (Subotić, 2011), a single test-wide score was used.

***Procedure***

The children were tested individually by the principal investigator, during their regular stay in the preschools. Testing phase was conducted during the spring of 2013. We did not put time limits on individual testing sessions, and we did not record the exact durations, but in most
cases, testing took roughly between 20 and 40 minutes per child. No obvious confounding factors were observed during the data gathering phase.

**Results**

The results showed that, as expected, children from Montessori preschool programs had a greater average phonological awareness scores ($M=43.30$, $SD=7.89$) than children from regular preschool programs ($M=31.23$, $SD=9.99$). This difference is statistically significant: $t(58)=5.19$, $p<.001$, $d=1.34$. According to Cohen (1992), $t$-test effect size is judged by the $d$ statistic, with values of 0.20, 0.50, and 0.80 being proposed as the general cutoff for small, medium, and large effect sizes respectively. Following these guidelines, it can be concluded that the effect size of obtained difference between the 5-year-olds from Montessori and regular preschool program is large. Note that there were no gender differences in the phonological awareness scores: $t(58)=-0.05$, $p=.96$, $d=0.01$.

**Discussion**

The findings of this study are quite clear: five-year-olds from Montessori preschool programs outperform their regular preschool program counterparts on a measure of phonological awareness and this difference is substantial. Montessori preschools regularly include phonological awareness activities (Philipps, 1999) and utilize a multisensory (i.e. haptic and visuo-haptic) approach to early literacy learning, which has also been shown to increase phonemic/phonological awareness (e.g., Bara et al., 2004). Thus, these results are not surprising and they are in line with findings of Lillard (2012), which showed that high fidelity Montessori programs are a superior alternative to regular/conventional preschools in several aspects, including literacy related variables.

The implications of our findings are, however, to be taken with caution. This was a small-scale pilot study, based on a convenience sample, and limited only to four Croatian preschools. We were unable to strictly control for several possibly important factors, such as intelligence of children, the home literacy environment, or socioeconomic status of parents. Obviously, differences in children’s intelligence could account for the results, as we know that intelligence and early literacy skills are correlated (e.g., Davidse, de Jong, Bus, Huijbregts, & Swaab, 2011), but there is also an evidence of literacy being a potential causal factor that increases intelligence (Ritchie, Bates, & Plomin, 2015). Thus, the situation might be even more complex. All that we could establish is that the children were subjectively judged by the preschool staff to be of normal development/cognitive potential, which is certainly not the same as actually controlling for this factor. Similarly, it is well known from the literature that home literacy environment and socioeconomic status of parents are interrelated and have an impact on children's literacy (e.g., Hartas, 2011; van Steensel, 2006). We could only rely on the self-reported average socioeconomic status of all the children's parents from our sample, and on claims that children were not exposed to the extensive home literacy activities.

With these limitations being noted, our findings are in concordance with other better controlled studies (e.g., Lillard, 2012), and based on our and related research, we argue that there are still enough grounds to suggest two things. First, parents of children from Croatia should be aware that they have Montessori as a viable (or desirable) alternative to regular preschools. And second, policy makers and regular preschool principals and staff should take a closer look at Montessori pedagogy and its practical aspects (and at a holistic approach to child development and education in general) and consider implementing some of them into the current regular preschools structure. While diluted, i.e. low fidelity Montessori programs are not as effective as high fidelity ones (Lillard, 2012), implementing some language related activities from Montessori pedagogy might still be a good idea, as “[...] some elements of classic Montessori preschool programs are particularly helpful to development” (p. 396) and it could be the case that “[...] even some Conventional programs could be improved by incorporating certain Mon-
Montessori like practices, such as use of haptic materials for early reading (rather than workbooks) and more executive-function-taxing activities. Exactly what those elements would be is a topic for further research.” (p. 396). This is, in essence, a direct implication of this study as well.

What particular Montessori pedagogy elements would be the most appropriate and effective to implement in order to improve phonological awareness (and other literacy outcomes) of children in regular preschools is simply an empirical question. Thus, future research should look into it in a systematic fashion. We can hypothesize that even inclusion on a regular basis of activities and exercises for which we provided examples at the beginning of this article (such as sandpaper or plate letters, and object-naming phonological exercises) might yield improvements in regular preschool children early literacy. Research has shown the effectiveness of such exercises even in isolation (i.e. use of haptic and visuo-haptic materials and protocols: Bara et al., 2004; use of systematic and explicit phonics instructions: Armbruster et al., 2010). The advantage of the Montessori approach is that it was the first pedagogy to recognize the importance of these activities, and that it has developed a very extensive, elaborated, and field-tested collection of related exercises. Given that the majority of Montessori exercises are actually not expensive to implement and that there is a potential for significant benefit, the research effort required in order to figure out which exercises and activities are best suited for regular preschool implementation is probably worth it.

Finally, being the first of its kind in Croatia, our results raise another interesting possibility. Namely, Croatian language has a high orthographic consistency and the majority of Croatian children achieve maximal levels of phonological awareness and decoding skills by the end of the first school grade (Čudina-Obradović, 2014). In comparison, languages such as English are less orthographically consistent and maximal phonological awareness and decoding skills are achieved up to several years later (Čudina-Obradović, 2014). This could mean that early literacy interventions might be even more important in Croatian, than in languages such as English, given the much shorter time frame in which all of these skills ought to be acquired. Thus, it is possible that the effect of programs such as Montessori might be particularly beneficial for Croatian children, but also for children who speak other similar languages, such as Bosnian or Serbian. This might be worth looking into as well.

Conclusions

This pilot study showed that children from Montessori preschool programs in Croatia have much higher levels of phonological awareness than their regular preschool programs counterparts. While more extensive research is obviously needed, the adoption of some Montessori preschool program language promoting activities and exercises could have a positive effect on the (early) reading skills of children from regular preschool programs as well.

References


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Razlike u fonološkoj svjesnosti petogodišnjaka iz Montessori
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Sažetak

Montessori predškolski program (MPP) predstavlja strukturirani program koji u sebi sadrži integrirane metajezične vježbe, čija primjena započinje prije nego li dijete navrši četiri godine. Suprotno tome, u redovitim predškolskim programima (RPP) u Hrvatskoj, aktivnosti vezane uz razvijanje vještina pisanja i čitanja predviđene su samo za stariju djecu. Također, za razliku od MPP, ove aktivnosti u RPP izdvojene su iz konteksta općih aktivnosti i igre, što je protivno spoznaji da se na dječji razvoj treba djelovati holistički. U skladu s navedenim, ovim istraživanjem željeli smo testirati pretpostavku da će djeca koja pohađaju MPP imati razvijeniju fonološku svjesnost od djece iz RPP. Fonološka svjesnost je metajezična sposobnost koja se odnosi na uvažavanje glasovne komponente govora i značajan je prediktor kasnijih jezičnih vještina. Uzorak je obuhvaćao 60 djece urednoga jezično-kognitivnoga razvoja iz MPP (M=5.21, SD=0.17 god.) i RPP (M=5.23, SD=0.18 god.). U svakoj skupini bilo je 15 djevojčica i dječaka. Testiranje je provedeno testom FONT-HR (Cronbachova α=.97). Rezultati su pokazali da, u skladu s očekivanjem, djeca iz MPP imaju razvijeniju fonološku svjesnost (M=43.30, SD=7.89) od djece iz RPP (M=31.23, SD=9.99). Razlika je statistički značajna i visokog je intenziteta efekta: t(58)=5.19, p<.001, d=1.34. Također, nisu utvrđene razlike između djevojčica i dječaka: t(58)=-0.05, p=.96, d=0.01. Iako je potrebno provesti dodatna istraživanja koja bi statistički iskontrolirala faktore poput inteligencije, ovi rezultati upućuju na mogućnu prednost organizacije jezičnih vježbi iz MPP u odnosu na RPP. Stoga bi zasnivanje koncepta jezičnih aktivnosti po uzoru na MPP moglo imati pozitivan efekt i na (pred) čitačke vještine djece iz redovitih predškolskih programa.

Ključne riječi: rana pismenost; holistički pristup obrazovanju; jezične vježbe; metajezične sposobnosti; strukturirana didaktička igra;