Joško SINDIK*, Saša MISSONI*

STIMULATING DEVELOPMENTAL MILESTONES OF PRESCHOOL CHILDREN THROUGH INTERDISCIPLINARY ALLIANCES BETWEEN SCIENTISTS AND PROFESSIONALS

Abstract: Contemporary science must show practical applicability, more than theoretical "larpurlartism". Psychological anthropology studies the interaction of cultural and mental processes, tending to focus on ways in which humans' development and enculturation within a particular cultural group, shape psychological processes. Psychological anthropology could be very useful in a process of control cross-cultural bias, while we try to implement "universal" indicators for practical purposes in the intercultural context. Adjusting psychological measuring instruments to certain culture can be "translated" in an attempt to find "universal" sets of indicators of anthropological characteristics, reducing these characteristics to elementary "atoms" of certain characteristics. In this article we have described the research project with the aims to find basic developmental milestones in certain aspect of psychosomatic development and to associate find the most appropriate activities for children for stimulating belonging basic milestones, can enable direct associating milestones and activities through ICT software, easy for using for children's parents and teachers.

Key words: *atoms of characteristics, ICT software, psychological anthropology*

INTRODUCTION

Instead of very often nominally mentioned aspect of interdisciplinary solidarity, contemporary science must show practical applicability, more than theoretical "larpurlartism". Anthropology is a science of humankind, which studies all facets of society and culture, describing the impact of humans on other humans. Applied anthropology uses anthropological knowledge and expertise to deal with modern problems, such as help in impact studies of technological innovations, public health schemes or economic development patterns. Psychological anthropology,

as an interdisciplinary subfield of anthropology, studies the interaction of cultural and mental processes, tending to focus on ways in which humans' development and enculturation within a particular cultural group, shape psychological processes, as well as how the understanding of those psychological processes enriches or constrains our models of cultural and social processes. However, although this determination of psychological anthropology is very wide and seems impractical and abstract, it could be very useful in a process of control cross-cultural bias, while we try to implement "universal" indicators for practical purposes in the intercultural context. Namely, using psychological measuring instruments always has to be adjusted to certain culture or certain sample of participants [1].

AIMS OF PRESCHOOL EDUCATION

One of the outcomes of the institutional preschool educational system in Croatia is to estimate and stimulate psychosomatic development of the children [2]. Parents and family members of the child are also intrinsically motivated in less systematic way to improve physical, medical, social and psychological well being of the child and they should have an active role during the phases of his development. In the available literature there is a large number of "developmental lists" for estimation of the developmental status of the preschool children (both genders), which include a list of child characteristics with different terminology: competency of the developmental milestones, developmental characteristic etc. A huge number of books and manuals with the list of children activities, mainly roughly classify depending on areas of psychosomatic development of the child of the different level specificity: motor control, social competency, control of the speech, etc. But, as far as we know, there is now information in the available literature on research how to link directly educational outcomes (what the child is capable to learn) with the modality how to achieve that (how can we achieve that directly).

DEVELOPMENTAL MILESTONES

Hence, an attempt to find "universal" indicators of anthropological characteristics has to be reduced to elementary "atoms" of certain characteristics. In the context of preschool child psychosomatic development, we have to consider developmental milestones as the "atoms" of development. Developmental milestone is a skill acquired within certain time framework. In other words, developmental milestones are sets of functional skills, or specific tasks that the majority of the children of the certain age can complete [3]. In comparison with characteristics and abilities of the children, the developmental milestones are easily recognizable skills that can be seen in the behavior of the child, namely "atoms" of the more complex psychosomatic characteristics of the child. For the ability evaluation and characteristics of the children there is a need for the sophisticated measuring instrument, made by the experts. To use those instruments is very expensive and needs time, but most important is to acquire specific and professional knowledge and/or specific kind

of practice. Developmental milestones are easily recognizable by non professionals and by experts (for example: "Child can draw a square", "Child can stand on one leg for at least 5 seconds"). It is easy to list developmental milestones through literature and they serve as a framework indicator of the developmental status of the child. In the preschool educational practice in Croatia, there is a tendency to give a general objective (direction) of the action of educators in the developmental tasks for the purpose of stimulating development of set of developmental skills. In educator practice, for those working in institutional system of preschool and secondary education there isn't any precise and define system of direct link between estimated developmental status of the child and developmental tasks. On the other hand, the developmental tasks give the information only about the general direction in the action of stimulating child development, while not giving the information what is the concrete content of the work (activities) that should be conducted so the children or group of children can adopt specific skill within certain time framework [4, 5, 6].

It is less common in scientific world to find an approach that uses developmental milestones as indicators of development, probably because of the fact that there are not enough scientifically established theoretical concepts that systematically interpret the whole personality and all aspects of the psychosomatic development of preschool children.

The approach to use developmental milestones as indicator of development has wide range of applicability from the practical point of view, because it is based on recognition of the indicators directly perceived by observing everyday behavior of the child in the natural environment. Because it is difficult to collect data from the preschool children by survey and questionnaire, the method to collect data by evaluating "elementary particles of development" (or developmental milestones) represents the easiest way to obtain facts about children's developmental characteristics. We can only assume that the child educators and parents have very intuitive, but not always accurate perception of child "developmental levels" [7]. Their judgment can be biased and there for decrease objectivity and reliability of the evaluation, which has repercussion on valid evaluation of the developmental level of each child [7]. Nevertheless, their apparent simplicity and practical experience of the implementation of the developmental milestones as indicator for children development [4, 5, 6] so far have been extremely useful for the experts who are involved directly in the preschool education in the Croatian preschool educational system.

A simple mathematic algorithm necessary to calculate a volume of direct educational work [4, 5, 6] with children for achieving developmental outcomes at the group level among all the children in the kindergarten, has been very useful for the education staff in order to give information about activities suitable for the children in such a manner that the entire group shows developmental progress [7]. For example, in the group of children where they not have reached a certain level of development in the area of specific aspects, i. e. developmental milestones in the area of motor development, while for the other aspects of psychosomatic development it is possible to plan less activities with children [7].

PILOT RESEARCH

In the pilot research we already made a preliminary list of developmental milestones for all areas of the children's psychosomatic development in the age range 1–7. For the purpose of preliminary review of efficiency of the developmental milestones as indicators of development in institutional preschool environment in Croatia, we carried out research, cooperating with "Professional Developmental Centre for Preschool Education Research at the Kindergarten Trnoružica", on the sample of 350 children, from the kindergartens all over city of Zagreb. The results of non–published pilot research have shown that there is a possibility of reducing a large number of developmental milestones into their smaller number, with satisfactory psychometric characteristics, reducing milestones in specific areas of children's psychosomatic development: motor, cognitive, speech and socio–emotional. Further on, interaction between developmental milestones from different area of child's psychosomatic development shows complexity of the preschool children development phenomena in different age groups. In other words, in different age groups there is a connection between developmental milestones from different areas of development, for example different aspects of motor speech and cognitive development, that can offer a further insight in the structure of development process of child's personality and his anthropological characteristics as a whole.

On the other hand, it has been demonstrated that for the experts – practitioners, i. e. educators of preschool children this approach of evaluating developmental status of the children based on the developmental milestones is very easy to use. At the same time, educators are familiar with the developmental milestones, because the children's behavior that is described with the developmental milestones is easily recognizable in everyday practice of the educational work with children, not depending on previous experience of the educators working with children. With the quality analysis of the educator's statements during the research, we've got an insight on how to establish a connection between developmental milestones (for example "Child can draw a triangle"), as a precise developmental outcomes and chosen activities with children as a tool for their achievement (e. g. a series of precise graph motor exercises that would help a child to learn how to draw a triangle). Actually, that is a direct connection between precise elementary developmental outcomes and the tools, i. e. ways how to achieve them. Regarding theoretical concept and positive experience from the last fifteen years of practice, this project would make possible all of the above, with specialized manuals that offer list of developmental milestones with concrete milestones for the concrete list of activities. This approach would be easy employable and widely applicable with the computer tool that would make easy evaluation and planning preschool development stimulation in the institutions ad well as at home.

PROJECT AIMS

Insight to the preliminary results, we agreed on the following actions. First, evaluation of the developmental status of the children defined by the terms of the

developmental milestones on the representative, stratified sample of preschool children in the preschool institutions in different regions of Croatia in the age range 1–7 (educators and parents). Second, the implementation of the multivariate statistic methods on collected data: to reduce a number of developmental milestones on smaller number of basic milestones which represent in satisfactory measurement (latent dimensions) of specific areas of psychosomatic development. Then, we'll listing a larger number of activities that can be done with children (games), and evaluate the level of suitability of each activity with the children in order to stimulate development in the domain of particular basic development milestones (selected sample of 30 experienced preschool educators). In next step, we'll publish a manual for children's parents and preschool teachers with related basic developmental milestones along with the activities for the children appropriate for their improvement. At last, when we associate basic developmental milestones in certain aspect of psychosomatic development with the most appropriate activities for children for stimulating belonging basic milestones, we'll make associate developmental milestones and activities through ICT software, convenient for use of children's parents and teachers. This approach makes a synthesis between qualitative (permanent analyzing children's behavior) and quantitative (successive finding latent dimensions of indicators recognizable in children's behavior) research approach, inherent for humanistic and social sciences. However, engineers contribute in operationalisation practical ICT tools for implementation scientific findings for everyday life.

PRACTICAL IMPLICATIONS

Development of computer software will be particularly useful for everyone working with children and at the same time scientifically especially relevant aspect of this project. The software will be designed user friendly for experts for the preschools system and for the non-professionals. Software will enable to the non-professionals (in most cases parents) simple insight into skills and knowledge their child should acquire in order to develop "regularly". Software enables for the experts, usually educators in kindergarten working with groups of children, optimum planning of activities for a group of children, so the entire group can make progress at the same time, by using algorithm for determination priorities and necessary volume of work to make possible developmental milestones.

This can be a new model for writing functional, pedagogical documentation. Further on, this software model can offer rough but useful information about potential children with difficulties in kindergarten environment, and can be described as children that show unsatisfactory status in large number of developmental milestones for the children's age group they are part of.

CONCLUSION

The significance of this collaborative interdisciplinary alliance between scientists and professionals lies in a fact that this scientifically based idea can have easy

practical use, even in this complex and sensitive area of the preschool children development. ICT software, based on the research reveals, can enable the direct link of the characteristic developmental milestones for the age and gender of the child with the direct activities with the children. That would make possible for the parents (non professionals) and for the educators in preschool institutions (experts) to precisely stimulate specific children's developmental milestones. The present practice of the preschool education would benefit most greatly from this ICT software and become more accessible. First of all, we will create a base for the preparation of the direct educational work, making easier for the educator to fill in the extensive pedagogical documentation in preschool institutions to make the process more functional and brief. Second, with the easier preparation for educational work, it would be possible that educators become more focused on practical implementation of the activities with the children on the basis of the exact indicators: estimated developmental milestones and correlated activities. Third, the acquisition of the computer tool serves as a link between milestones and activities with the children and can create a foundation for linking educators and creative combination of activities and finding new activities with the children that can be stimulating for development of greater number of milestones at the same time.

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