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THE THINKING TEACHER

June-July 2018

Regional Conference Set for PRAGUE in October

The IACEP vice presidents for Europe and the Middle East, Lenka Krejcová and Alex Kozulin, have announced a joint regional conference to be held in Prague, Czech Republic, on October 3-5, 2018.



The theme of the conference is ***Dynamic assessment and cognitive intervention: Bridging the gap between theory and practice.*** This theme addresses a set of persistent and very important questions for cognitive educators: How to move from cognitive developmental theory to classroom (and clinic) practice, and how information gained from dynamic assessment can influence educational practices.

Co-organizers are:

Faculty of Education, Charles University, Czech Republic

Faculty of Arts, Charles University, Czech Republic

Faculty of Education, University of Presov, Slovak Republic

Centrum Cogito, Czech Republic

ATC "Methods of Prof. Feuerstein", Czech Republic

[Call for Papers and Submission of Proposals](#)

Proposals for presentations must be submitted online (see web site information).

[Papers](#)

A paper proposal comprises the complete title of the paper, information about the authors and their affiliation, an abstract of the paper of about 300 words (max. 2000 characters, spaces included) and up to four keywords. The abstract will be published in the abstract book. Some of the papers, based on their topics, will be chosen and the authors invited to participate in a symposium.

[Posters](#)

A poster proposal comprises the complete title of the paper, information about the authors and their affiliation, an abstract of the poster of about 300 words (max. 2000 characters, spaces included) and up to four keywords. The abstract will be published in the abstract book.

Symposia

Symposium proposals comprise preferably four papers and no fewer than three. Please submit the complete title of the symposium, information about the organizers, an abstract of the symposium of about 300 words (max. 2000 characters, spaces included) and up to four keywords. For each individual paper you have to provide the complete title, information about the authors and their affiliation, an abstract of each paper of about 300 words (max. 2000 characters, spaces included) and up to four keywords.

Workshop proposals

Please, contact: alexk@icelp.org.il

Important dates

August 15th 2018 – DEADLINE FOR SUBMISSION OF PRESENTATION PROPOSALS

August 15th 2018 – EARLY REGISTRATION

September 20th 2018 – REGISTRATION DEADLINE

Scientific programme

Depends on your proposals!!!

Keynote Speakers:

- » **Alex Kozulin**, Achva College & Feuerstein Institute, Israel
Still unrealized potential of the learning potential model
- » **Alexander Minnaert**, Groningen University, The Netherlands
Voices from psycho-educational practice in reaching the potentials of children and youngsters: the challenging gap between assessment, diagnosis and intervention

- » **Gabriel Seidlova Malkova**, Charles University, Czech Republic
The paper will be announced soon

Venue

Faculty of Education, Charles University, Prague:
<https://goo.gl/maps/ZGD1tuwwFYP2>

(There is a wide range of accommodation options near the university site, which is in the center of Prague)

Organizers

Scientific committee:

- » Iveta Kovalcikova, University of Presov, Slovak Republic
- » Michal Nedelka, Charles University, Czech Republic
- » Jo Lebeer, University of Antwerp, Belgium

Organizing committee:

- » Lenka Krejcova, Charles University, Czech Republic
- » Ilona Gillernova, Charles University, Czech Republic
- » Vladka Snoblova, Charles University, Czech Republic
- » Hana Sotakova, Charles University, Czech Republic
- » Sigal Eden, Bar Ilan University, Israel
- » Filip Sinkner, Charles University, Czech Republic

See IACEP conference website:

<https://kpskonference.ff.cuni.cz/iacep/>

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<https://www.facebook.com/Conference-IACEP-2018-in-Prague-636218216717197/>

Help Needed: Cognition & Inclusion Project

Within the framework of the ERASMUS+ program¹, Den Achtkanter² is the recipient of a grant to coordinate actions during the next three years to enhance the visibility and effectiveness of cognitive approaches for adults challenged by learning disabilities. The European Commission supports this project, as it believes firmly that transversal skills (cognitive, metacognitive, problem-solving skills) are essential for active, autonomous and successful participation in society. Nine organizations are involved. Some of them implement specific methodologies and share their experiences; others are involved in academic and vocational education and training.

In Europe, cognitive approaches in services for low functioning adults are rarely implemented perhaps being unknown or difficult to apply. The first goal of the Inclusion and Cognition project is to collect good practices and to analyze these practices (strengths and weaknesses, conditions for implementation, evidence of effectiveness). A resource book will be produced and disseminated. This sharing of good practices is the starting point for the partnership to develop assessment instruments that reflect the best conditions for effective implementation of cognitive approaches. The first of these instruments is intended to assess the belief system/mindset of practitioners regarding intelligence, cognition, and inclusion. It is obvious that when practitioners do not believe that their clients/learners, because of, for example, intellectual disability, cannot learn or

must depend on others for problem solving, they will not make the necessary effort to teach the learners to solve problems. If practitioners have a fixed mindset, the clients/learners will not develop a growth mindset. The second instrument will be designed to assess the belief system/mind set of the service that employs the practitioner. This instrument will be a search for indications of consequent policies (Human Resource Management) and support systems (Vocational Education and Training). The third instrument is to be one for evaluating the outcomes of interventions focused on the clients/learners themselves: Have they developed a growth mindset, and what are their attitudes regarding efforts, learning, and their own potential? The partners in the Cognition and Inclusion project know of a few instruments for practitioners, but most of these were developed in for use in education, kindergarten, and elementary school. We do not know of any information-gathering instruments whose goal is to assess the mindsets of clients/learners who are adults with learning disabilities.

As a long-time member of IACEP, I invite all IACEP members to send me your suggestions that help us to develop the assessment instruments, especially the ones on the practitioners and clients level. Once the instruments are developed (by August 2020), they may be useful for all of you. We will be happy to share what has been developed. Please send ideas and suggestions for the development, content, and form of these instruments to me at the following address:

¹ ERASMUS (European Community Action Scheme for the Mobility of University Students), sponsored by the European Union, is an exchange program for students and for strategic partnerships. ERASMUS+ combines the EU's current programs for education, training, youth, and sport.

² 'Den Achtkanter' is the Flemish name of a variety of poplar tree found near farms close to the coast that protect against severe weather. It is the name of a B organization that advocates for and supports services to persons with disabilities.

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Cognitive Education in Singapore³

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Technological University, Singapore



Alice Seok Hoon Seng

The day would have been like any typical work day except that on 16 June 2015, we met with Dr Alice Seng to brainstorm ideas for the setting up of the Mediated Learning Laboratory (MLL) at the National Institute of Education, Singapore. Even before Dr Seng was engaged as a consultant for the set up and establishment of the MLL, she was always ready to share with the MLL team members her expertise and latest developments in the field of cognitive education. To that end, she had played an instrumental role in guiding the direction of MLL, and we always enjoyed listening to her interesting anecdotes because they gave us a historical view of cognitive education in Singapore and overseas.

Dr. Seng was an Associate Professor of Psychological Studies at the National Institute of Education (NIE). Prior to that, she had taught in primary and secondary schools and junior

college for 10 years, followed by another 40 years in a teachers college. Although she is currently happily retired, she continues to teach occasionally as an educational consultant with NIE (International).

In 1984, she was sent by NIE to attend the Hadassah-WIZO-Canada Research Institute international workshop on Structural Cognitive Modifiability (SCM) in Jerusalem. Dr. Seng related that she actually had no clue what SCM was about then, but because she was assigned to the *Instrumental Enrichment* workshop, she met Professor Reuven Feuerstein, who was the director and chief trainer. Like most people's first encounter with Professor Reuven Feuerstein, she was deeply impressed by him and his team. Her doctorate was on Piagetian cognitive tasks, so it was a happy circumstance when she discovered that Reuven had actually studied with Piaget. In that unforgettable workshop, Dr. Seng was introduced to SCM and MLE (Mediated Learning Experience), and she subsequently returned to the International Center for the Enhancement of Learning Potential (ICELP), Shoshon, Israel in 1988, 1995 and 1997, to complete the Trainers Diploma in *Instrumental Enrichment*, before moving on to obtain her Advanced Trainers Certificate. On reflection, she realized that the years in between training sessions gave her the time and space to consolidate her understanding of Feuerstein's cognitive programs and their applications. After her training, Dr. Seng discovered that contrary to her previous narrow and specific training, which is mainly appropriate for application in practical

³ This is the third in a series of articles highlighting the contributions of our colleagues. The series is under the direction of Joanne Hardman who would be happy to receive suggestions for future articles (joanne.hardman@uct.ac.za).

research in the schools and to the professional preparation programs for educators, the Feuerstein methods and programs can be applied across a wide spectrum in both educational and even non-educational settings such as parent education and pre-school settings, among others. In addition, the Feuerstein method and other related cognitive programs can be a very powerful set of thinking tools in the hands of a well-trained educator, and if applied properly and systematically, Feuerstein's mediational strategies can open up the minds of both the teacher and the students, creating a symbiotic relationship.

When the sixth International Conference on Thinking was hosted by NIE in 1997, Reuven Feuerstein was one of the invited speakers for the keynote address, and for the first time Singapore educators were introduced directly to MLE and SCM. This Thinking conference was pivotal to heighten awareness of cognitive education and also reinforce its importance.

Over the years, Dr. Seng got involved in funded research projects on Feuerstein's theories and other cognitive education programs in the Singapore school setting, applying MLE strategies in a variety of classroom situations such as thinking strategies for mathematics in a primary school, and with physics lessons in a secondary school. It was during a round table discussion at a Conference in Calgary that Dr. Seng was introduced to Professor Carl Haywood and his *Bright Start* cognitive early education program, which resulted in her involvement in implementing the program in the preschool setting. Dr. Seng also participated in implementing Dr. Mogens Jensen's *MindLadder* in some secondary schools as well as Professor

David Tzuriel's methods of dynamic assessment in pre-schools.

In time, interests and involvement in the cognitive programs of Feuerstein, Tzuriel, and others began to grow, and some conferences and training for parents and interested teachers were conducted in NIE since 2007. Dr. Seng was further involved in teaching a post-graduate course and was editor of three books that have been important for cognitive education in Asia and beyond (see Bibliography). In some ways, the baton has now been passed on to MLL, which was launched in 2016 to carry on research and training in MLE.

After each intervention program or teaching event that Dr. Seng had implemented, she would deliver papers, participate, and present her ideas at the bi-annual International Association for Cognitive Education and Psychology (IACEP) conferences. By 2003, she became the Vice-President (Asia-Pacific Rim) of IACEP.

Looking back on her 50 years of teaching in the schools and in preservice teacher education, Dr. Seng observed a remarkable increase in teachers' awareness about cognitive education. With advancements in the field of neuroscience and with teachers attending more training workshops, attachments, and professional development in and outside of Singapore, they are now more cognizant of cognitive education and what our minds are capable of creating.

Dr. Seng's work has not only allowed her to gain an in-depth understanding of the Cognitive Education landscape in Singapore, she was also introduced to a wonderful group of academics and researchers in cognitive education at each IACEP conference that she attended, and some have become her lifelong friends. Dr. Seng

expressed that she hopes to see the introduction of a number of training programs for all levels of teacher education, from pre-service to in-service to further professional development by the MLL, and these practical sessions will be supported by evidence-based practices so that findings are shared periodically with other professionals in the field.

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From 1992 to present: New Frontiers in Cognitive Education for Individuals with Intellectual Disability

Hefziba Lifshitz

Bar-Ilan University

In his article *Elements of Cognitive Education for Mentally Retarded Persons*, Paour (1992/2018) addressed the topic of cognitive education for individuals with mental retardation. He focused on the need for cognitive education for persons in this population, suggesting that it would help prepare them to be more effective and efficient learners. He then described the type of cognitive

education interventions, and identified very specific aspects of cognitive education that are especially applicable for addressing the intellectual deficits of these persons.

As was the practice in 1992, Paour used the traditional terms and classification systems of mental retardation, which revolved primarily around IQ of two or more standard deviations (IQ 70-75) below the population mean (Grossman, 1983), including four levels of classification based on IQ. He identified the intellectual deficits of individuals with mental retardation in information processing, memory, abstract thinking, use of strategies, metacognitive skills, and motivation.

The field of mental retardation has undergone a huge transformation since 1992, across the educational, rehabilitation, social, and human service organizations (Schalock & Luckasson, 2013; Tasse, Luckasson, & Schalock, 2016). These changes are expressed, *inter alia*, in naming, defining, diagnosing, and classifying the disability.

In 2010, the term "intellectual disability" (ID) was adopted by the American congress and President Barack Obama as an alternative to "mental retardation," in accordance with Rosa's Law and the US federal law (S. 2781, 111th Congress: Rosa's Law, 2015). The name of the American Association on Mental Retardation was changed to American Association on Intellectual and Developmental Disabilities (AAIDD). The AAIDD and the Individuals with Disabilities Education Act (1990; United States Department of Education, 2010) and the DSM-5 (American Psychiatric Association, 2013) brought about transformation, not only in terms of the traditional definition (Grossman, 1983), but in

the concepts, orientations and attitudes toward this disability.

The new AAIDD (2002; 2010) and the DSM-5 (APA, 2013) definitions of ID are based on the social ecology model (Berkson & Landesman-Dwyer, 1977; Landesman-Ramey et al., 1997), according to which the limitation or functioning of individuals with ID should be regarded in the context of the support they receive from their environment in three dimensions: the microsystem, the mesosystem and the macrosystem. The *microsystem* includes the individual, the family, and close associates. The *mesosystem* includes the organization providing services and supports and the communities within which people live, work, and recreate. The *macrosystem* includes the larger service delivery system and society. These concepts are expressed in the classification of the sub-levels of ID according to intensity of support (AAIDD, 1992; 2002; 2010) and back to the four levels of ID (mild, moderate, severe, profound) in the DSM-5 (APA, 2013), albeit according to the level of support they need in adaptive behavior (conceptual, social and practical) rather than IQ.

These changes were influenced and anchored in the disability rights movement (Pfeiffer, 1993) and the self-advocacy movement (Buchanan & Walmsley, 2006), which are person-centered and focus on the strengths of individuals with ID, not on their weaknesses. These approaches are in line with the “active modification” approach and the Structural Cognitive Modifiability (SCM) theory of Reuven Feuerstein (Feuerstein, 2003; Feuerstein & Rand, 1974; Feuerstein & Falik, 2010). The basic assumption underlying these theories is that the human organism is by nature a system open to its environment and accessible to change, even in the presence of three

formidable obstacles usually believed to prevent change: age, etiology, and severity of limitations (Feuerstein, 2003; Feuerstein & Rand, 1974). It took 30 years for these claims to gain scientific recognition.

My colleagues and I agree with the need for cognitive education of individuals with ID. In our opinion, the goals of cognitive education for this population go beyond their being good learners. Murray, McKenzie, and Murray (2014) found an association between *g* (general intelligence) and the three factors of adaptive behavior: conceptual, social, and practical. Thus, it is reasonable to expect that improving cognitive functioning of individuals with ID would contribute to their adaptive behavior performance. (b) The *Normalization* (Wolfensberger, 2011), *Quality of Life* (Schalock, 2005), and *Self-advocacy* (Buchanan & Walmsley, 2006) principles are guided by the vision that all individuals with disabilities should be valued members and citizens of their community and society with equal rights and opportunities. Participation, involvement and inclusion in society, whether at educational, vocational, or leisure facilities, requires manipulation of cognitive skills and strategies. (c) Coping with the rapidly changing technology of our digital world influences fundamental areas of everyday life (Shamir, 2013) and requires activation of cognitive skills. (d) Accelerated progress in brain and neuro-psychological science indicates a reciprocal relation between brain and cognitive modifiability. Experiments using functional magnetic resonance imaging (fMRI) reveal neural plasticity of the brain as a result of a cognitively stimulating environment, including

individuals with ID (Head, Lott, Patterson, Doran, & Haier, 2007).

In 2015 I developed the Compensation Age Theory (CAT, Lifshitz-Vahav, 2015). This theory focuses on two compensation mechanisms that open new frontiers for persons with ID. Through the lens of the CAT, chronological age serves as one of the compensatory mechanisms and plays an important role in determining the cognitive ability of individuals with ID beyond their mental age. Based on empirical findings, the CAT holds that adults with ID can be cognitively modified at an advanced age, and can even acquire abstract cognitive skills that were previously absent from their cognitive repertoire, such as analogical reasoning (Lifshitz, Tzuriel, Weiss, & Tzemch, 2011) and metaphoric language (Shnitzer-Meirovich, Lifshitz, & Mashal, 2017). There is a myth that individuals with ID cannot benefit from direct learning experience. Findings of studies by my colleagues and me indicate that crystallized (Vocabulary, Similarities, WAIS-III) and fluid (Block design, WAIS-III; Raven's Progressive Matrices) intelligence of adults with non-specific ID and with Down syndrome exhibit a continuous development trajectory from adolescence (16 -21) to their mid-forties (25-45) (Chen, Lifshitz, & Vakil, 2017; Lifshitz, Bustan, & Shnitzer-Meirovitz, in press) without intervention. According to the CAT, maturity and cumulative life experience help adults with ID to acquire cognitive skills without any type of mediation. This suggests that they are able to benefit not only from mediated learning experience but from direct learning experience as well. Furthermore, the Cognitive Reserve (Stern et al., 2005) and Cognitive Activity (Wilson & Bennet, 2003) theories, which deal with compensation mechanism in adulthood of the

general population, were found to be applicable to the population with ID. Head et al. (2007) suggested that genes that are over-expressed in individuals with Down syndrome (APP, DSCAM, MNB/DYRK1A, RCAN1) produce proteins critical for neuron and synapse growth, development, and maintenance and provide further evidence for the activation of plasticity mechanisms in this etiology. These genes may lead to developmental cognitive deficits in younger ages, but paradoxically, with aging may participate in molecular cascades supporting neuronal compensation.

The second mechanism, beyond chronological age, is cognition itself. I describe elsewhere in this paper the essence of cognition in the population with ID. There are individual differences *within* the ID classification. At my university we therefore offer cognitive education programs tailored to and focused on the strengths of those with fewer cognitive difficulties (mild and moderate ID) as well as for those with greater cognitive difficulties (severe and profound ID).

The international community recognizes the social and economic benefits that continuing education offers for employment and full participation in society (Plotner & Marshall, 2015). As a consequence, enabling access to postsecondary university education for people with disabilities, particularly those with ID (Grigal, Hart & Weir, 2012), has increased significantly in recent decades.

The Empowerment Project at the School of Education of Bar-Ilan University provides three models of university inclusion for adults with ID. In the *separate model*, students with ID attend the School of Education and study Psychology,

Sociology, Geography, Self-Advocacy, adapted to their functional level. In the *hybrid model*, students with ID are included in a typical undergraduate research seminar together with students with typical development, but the material is also adapted to their level. In the *full inclusion model*, 10 students with ID are included in undergraduate courses (two with Down syndrome, one with Williams syndrome, one with Kabuki syndrome and two with non-specific etiology). The students are registered through the university as auditors (for these specific courses), which allows them to receive academic credits if they fulfill the course requirements. A special education teacher accompanies them during the courses and for each academic hour they receive an additional hour of mediation. They have passed the examinations and performed class work that has so far earned them 15 academic credits (out of 64 credits needed for the baccalaureate degree). To the best of our knowledge, there are three adults with Down syndrome in the world who have succeeded in completing a bachelor's degree, in Japan, Spain, and the United States. The empowerment project at Bar-Ilan University follows this direction.

Only after two years of running the project, we decided to administer tests of crystallized and fluid intelligence, using the WAIS-III and Hebrew abstract-verbal tests. In Study 1 (Lifshitz, Nissim, Shnitzer-Meirovich, 2016), which focused on the students with ID in the separated and the hybrid models, we examined the effects of participating in post-secondary academic courses on crystallized and fluid intelligence of adults with ID with and without Down syndrome. Regression analysis indicated that participation of students with ID in PSE contributed to their scores in

semantic fluency, homophones (verbal crystallized tests), and even to the Raven matrices test (a test of fluid intelligence). Study 2 (Lifshitz, Verkuile, Shnitzer-Meirovich, & Altman, in press) examined whether crystallized and fluid intelligence and cognitive tests can serve as screening tests for determining the appropriate placement of students with ID for the adapted enrichment model versus the full inclusion model. The sample included 31 adults with ID: students with ID who were fully included ($N = 10$) and students with ID who participated in the adapted enrichment model ($N = 21$). Crystallized and fluid intelligence were examined (WAIS-III, Wechsler, 1997) as well as Hebrew abstract verbal tests (Glanz, 1989). The most prominent differences between the groups were in vocabulary, knowledge, and digit span (subtests of the WAIS). ROC analysis, a fundamental tool for diagnostic test evaluation, was used to determine the students' eligibility for appropriate placement in the two models. The general IQ and idioms test seem to be best determiners for appropriate placement of students with ID to one of the two models.

Following these trends, it would be unreasonable to say that declarative (*accumulation of learning* that may lead to understanding) and procedural (*applying knowledge* in the course of problem solving) abilities of individuals with ID are fixed or that individuals with ID exhibit less structured, and therefore less efficient, organization of empirical knowledge. Furthermore, qualitative interviews indicate a higher level of intrinsic motivation and self-determination of these students to continue in the program despite the burden it places on their shoulders.

At Bar-Ilan University we have developed the CAB (Cognition, Affect, and Behavior program, published earlier as the MISC approach; Klein, 1992; Lifshitz & Klein, 2007; Lifshitz, Klein, & Fridel, 2010), which aims at introducing cognition, literacy and behavior during daily life activities to individuals with severe and profound ID. Mediation of these components is conveyed by teachers, paraprofessionals and direct staff or caregivers through their interaction with their students or workers with ID, not in formal lessons, but during meal time, domestic skills, work, and leisure activities.

Finally, recent developments in genetic engineering and brain science focus on the production of transgenic mice models of various ID etiologies (i.e., Down syndrome, Rett syndrome, fragile X, and others). Scientists have succeeded in finding pharmaceutical inhibitors of the damaged genes *in vivo*. Studies using fMRI indicate that environmental stimuli influence the strength of synapses in the prefrontal cortex and the hippocampus (Das & Reeves, 2011; Head et al., 2007).

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PLAY AND COGNITIVE EDUCATION⁴

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Play is commonly recognized as a universal phenomenon of childhood and one of the most important ways that children learn about the world around them. Through early sensorimotor experiences with objects that are hard or soft, that roll or bounce, that rattle or shine, children learn to piece together general concepts about the world. They learn about movement and space through their reflexes and their senses of sight and sound. Play also contributes to the developing child's social and emotional growth. The bond between infants and their parents is strengthened by their first and continuing playful encounters. Feelings of success that children experience through play provide them with increased confidence as they attempt new and more challenging learning tasks. Play becomes a medium through which young children practice skills and solve problems, becoming increasingly independent as well as increasingly able to cooperate and play with others.

Early childhood educators have long recognized the value of play in children's learning. Almost without exception, preschool programs have traditionally included opportunities for play. In *Bright Start* (Haywood, Brooks & Burns, 1986; 1992) there are opportunities for children to play throughout the day. The classroom schedule includes several free play periods as well as a period of directed free choice during which children choose from a number of activities that

focus on cognitive, affective, and other developmental goals that are to be presented in the context of what is essentially object play. The mediational teaching style, a key component of both *Bright Start* (Haywood, Brooks, and Burns, 1992) and *Instrumental Enrichment* (Feuerstein, Rand, Hoffman, & Miller, 1980), implies that naturally occurring, child-initiated opportunities for mediating the cognitive functions that are taught can be the most effective teaching interactions. These interactions occur most readily during play periods, but teachers as mediators must be alert for the teaching opportunities that play affords.

CHARACTERISTICS OF PLAY

Researchers and theorists have difficulty establishing a common definition of play because it takes so many different forms. Fewell and Kaminski (1988) pointed out that the great variability of play has led to difficulties with its definition, but that most theorists agree on the following characteristics:

1. Play is intrinsically-motivated. It is done for its own sake and as its own reward.
2. It is undertaken by choice. It is spontaneous and voluntary.
3. It involves enjoyment and does not occur when the person is in a state of anxiety.
4. Play is self-generated and includes active involvement on the part of the player.

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THEORIES OF COGNITIVE DEVELOPMENT AND PLAY

Piagetian theory provides a framework for the study of children's play, especially in terms of its cognitive and developmental aspects (Piaget, 1962). In this framework children's toy play is rated in terms of its complexity: simple infantile sensorimotor schemas (hitting, banging and mouthing, for example) and combining toys (stacking, filling, for example) are at a sensorimotor level. At the pre-operational level, "appropriate" use of toys directed at self, other person, or doll (feeding, dressing, covering with blanket) begins to develop. In symbolic play, objects are represented by other objects or by reference and gesture (pretend play).

Piaget conceptualized cognitive development as a dynamic process in which stimuli that have not been encountered before result in a kind of restructuring of the child's current understanding. Through complementary processes of assimilation and accommodation (called equilibration), children advance through the stages that are seen when they play. Of key importance to those who plan play environments for young children is the notion from Piagetian theory that in early childhood, during the sensorimotor and preoperational stages, the ability to conceptualize meaning and restructure understandings is highly dependent on the opportunity to explore, manipulate and observe concrete objects. Thus, a wide variety of toys and other physical objects will increase the likelihood that a child will develop the necessary concepts to proceed to the next stage.

In general, developmental and cognitive psychologists have emphasized the importance of the social environment for young children.

The idea that the physical/object environment is also critically important for optimal cognitive growth is key for practitioners who are working with children on a prelinguistic level. Wachs (1985) pointed out that little attention has been focused on whether toys as a part of the physical environment actually influence development. Rather, the assumption is that either toys serve as a diversion, or they contribute to learning and development, but the processes through which this contribution is made have seldom been examined. Wachs asserted that not only is it possible that there is great organismic specificity in the effect of the physical or social environment, but that there must be great complexity between individual children and their social and physical environment. In addition, certain children may actually be more responsive to the physical environment and others to the social environment.

Wachs pointed out that while many intervention programs demonstrate overall gains, there is a great deal of variation among children and that the common strategy of applying a standard set of intervention strategies to what is essentially a heterogeneous population will ensure that a certain percentage of the children will not benefit. When applying intervention strategies, considerations about the nature of the play environment should include considering the level of stimulation children can tolerate. Some children require a calming environment, and others need more stimulation in order to focus attention and engage in activities that will promote cognitive growth. Individual differences can be as important in determining play needs as in prescribing approaches to learning to read. Certainly bringing attentional resources to bear on cognitive tasks is a primary developmental

issue during the early childhood years and needs to be taken into account when planning play environments.

Research on the relationship between toys and cognitive development has produced data that are largely inconsistent, in part because of the individual differences referred to by Wachs. Two stimulus dimensions, variety (both short- and long-term) and responsivity, appear to be most salient in influencing subsequent development (Wachs, 1985). The common practice of changing play materials in preschool classrooms finds support in empirical data. Such practices are indeed associated with growth over a variety of developmental parameters including language, cognitive development and exploration. Responsivity of play materials (that is, to what extent they "act back"), according to Wachs, is also associated with cognitive growth. This finding has particular implications for the use of microcomputers in preschool settings where children's interactive attempts are assured of a response. With young children who have physical handicaps, the benefits of such practice seem especially promising.

Vygotsky proposed a theory of learning and development that is especially useful for practitioners as they consider the value of play as a learning medium. According to Vygotsky (1978), during the second year of life a unified system of speech and eye-hand coordination appears, and is useful in solving problems. Tools (which may include play materials), according to Vygotsky, are used as instruments to accomplish some activity, and thus become parts of the "object environment." As mediators of activity, they are linked to more advanced intellectual functioning, such as language. Thus, according to Vygotsky, children's cognitive development is

linked to their opportunities (provided through play, especially with use of tools) to develop a normal language system as well as a responsive, varied and manipulable object environment.

Vygotsky (1978) introduced the concept of the *zone of proximal development* (ZPD). The ZPD is the "distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (p. 86; emphasis mine). Play environments may provide especially rich opportunities for children to operate and expand these zones of proximal development when adult guidance or collaboration is readily available. The implication for practitioners is that mixed age and developmental groupings may afford these opportunities for collaboration. Further, a mediational teaching style suggests that "free" play does not preclude teacher guidance and interaction but that interaction should remain a child-adult partnership rather than being either completely unguided or totally adult-directed.

"Mediational" teaching has been delineated by Feuerstein (Feuerstein & Rand, 1974; Feuerstein, Rand, & Hoffman, 1979) who expanded Vygotsky's notions regarding the importance of social interaction in children's early learning. Feuerstein acknowledges that learning certainly occurs through direct exposure (interaction between children and their physical environment), but that mediated learning experiences that involve a child and a more cognitively competent peer or an adult caregiver are important in bringing about structural cognitive change and are essential to adequate cognitive development of children. The

implications for practitioners who work with young children have been elaborated by the authors of *Bright Start* and are manifest in the mediational teaching style (Haywood, 1987; Haywood, Brooks and Burns, 1986, 1992). Children who experience handicapping conditions or are at risk for developmental delay may require more than the average amount and intensity of mediational teaching. Such teaching takes account of the criteria for MLE, which include (Feuerstein, et al., 1979):

- 1) Intentionality: The interaction is intended to bring about cognitive change in children.
- 2) Transcendence: The change must be generalizable to new learning situations.
- 3) Communication of meaning and purpose: The mediator explains why one is doing a particular activity in terms of its cognitive/developmental objectives.
- 4) Mediation of a feeling of competence: Feedback includes praise for what is done correctly as well as precise identification of the correct and incorrect aspects of the child's performance. All of the effort is accepted, and as much as possible of the product.
- 5) Regulation of behavior: This includes assisting the child in marshalling attentional resources, by inhibiting impulsive responding and facilitating the expression of blocked responses.
- 6) Sharing: The notion in this criterion is that the mediators are partners in the learning enterprise, each with a defined role.

"Mediational teaching is characterized by awareness of the criteria of MLE and of the developmental needs of the children, by structural-cognitive goals rather than

immediate-correct-answer goals, by attempts to elicit process responses from the children, by challenging of both correct and incorrect responses, and by the use of extremely varied content material as vehicles for the teaching of cognitive processes and strategies" (Haywood et. al., 1992, p.13). This style of interacting with young children is particularly adaptive for interacting with children during play because it focuses on an interactive process between children and mediators. It is important to note in this context that two of the criteria for mediated learning experience include mediation of a feeling of competence and shared participation. If practitioners agree that what we describe as play must be activity that is self-generated, voluntary, and spontaneous, then intervening with the cognitive or affective processes occurring in play can only be accomplished in the interactive, shared participatory sense that mediational teaching implies.

PLAY AND THE DEVELOPMENT OF INTRINSIC MOTIVATION

Theorists and researchers recognize the importance of children's motivation in the development of their learning processes. Vygotsky (1978), Haywood and Burke (1977), and Bradley (1985), as well as many others, have argued that objects that have novelty, surprise, or complexity increase arousal, which leads to engagement in activities that not only contribute to cognitive development but also lead to a motivational orientation to engage in activities for their intrinsically motivating essence. Mastery motivation or effectance motivation, as described by White (1959) and others (Harter, 1978, Yarrow, MacTurk, Vietze, McCarthy, Klein and McQuison, 1984), suggest that children are

inherently motivated to engage in challenging experiences. As children encounter success in these experiences, they experience themselves as causative agents in the environment, which leads to feelings of self-worth and pleasure and makes continued engagement with challenging activities more likely. Yarrow and his colleagues have demonstrated an association between early cognitive development and such mastery motivation (Yarrow, MacTurk et. al., 1984; Yarrow, Morgan, Jennings, Harmon, and Gaiter, 1982). Haywood and Burke (1977) suggested that failure to achieve success in challenging activities is likely to lead to an extrinsic motivational orientation and then there is less likelihood of continued engagement in challenging cognitive activities. Thus, the match between children's development capabilities and the play materials available to them needs to be carefully considered by practitioners. Material that is too challenging will lead to frustration and failure, but material that is not challenging enough is unlikely to engage children and the outcome will be equally disadvantageous. The teacher as mediator in this setting will be alert to opportunities to assist children in finding effective means to solve challenging cognitive problems as well as asking children to reflect on the effectiveness of their problem solving strategies.

PLAY OF CHILDREN WITH HANDICAPS

Studies of the specific characteristics of play of young children with handicaps have been infrequent and often methodologically flawed (Quinn and Rubin 1984, Fewell and Kaminski, 1988). This dearth of sound empirical data, according to Fewell and Kaminski (1988), is related to the relative recency of interest in play as a medium for intervention with young

children with handicaps. As Rogers (1988) has pointed out, while early childhood education has valued play as a primary mode for children's learning, present-day early childhood special education seems to have been influenced by methods developed from work with older severely handicapped children. These methods are characterized by massed- practice, operant teaching procedures that focus on the development of skills across developmental domains. Play, from this perspective, was likely to be viewed as a free time or reward activity rather than an instructional or developmental tool.

Rogers (1988) observed that young children with handicaps demonstrate the same basic developmental sequence across sensorimotor and symbolic stages of play as do normally developing children. While these sequences remain the same, however, handicapping conditions that young children experience appear to lead to differences in the quality and quantity of their play. Young children with handicaps represent a heterogeneous group whose play varies as their capabilities vary. Odom (1981) observed preschool-age moderately and severely mentally retarded children during periods of free play and concluded that play development is usually similar to cognitive developmental age. Thus, the more severe the handicap, the greater the effects on both play and cognitive development.

Children with language delays and hearing impairment demonstrate generally normal patterns of development in the sensorimotor stages of play development, but they also have been found to engage in symbolic play less and solitary play more often (Gregory, 1976). Delays in representational play seem to be primarily

related to the lack of development of a language system. Both Darbyshire (1977) and Mogford (1977) reported that hearing-impaired children who acquired hearing aids early in their development exhibited more advanced play skills than did those whose hearing aids arrived later. Interestingly, in a study by Terrell, Schwartz, Prelock and Messick (1984), language-impaired children demonstrated symbolic play skills that were superior to those of nonhandicapped peers who were chronologically younger but who had the same language age. Thus, there seems to be a maturational component in symbolic play that is relatively independent of language.

Li (1981) characterized children with mental retardation as having a restricted play repertoire, as limited in the play materials selected, and as restricted in language use, compared to children who are developing normally. Similarly, Hill and McCune-Nicolich (1981), Mahoney, Glover and Finger (1981), Krakow and Kopp (1983), and others have found that children who experienced developmental delays demonstrated play skills that were likely to be delayed in frequency and length of speech utterances and in length of attention span, as well as less sophisticated in representational play.

The play of children with physical handicaps is restricted in fairly obvious ways. Poor head and body control limits the children's ability to look at, track, or explore their environment visually or motorically. They appear to be less attentive to the play environment, more passive, and more likely to engage in solitary play than their peers (Greenberg and Field, 1982). Jennings, Connor, Stegman, Sankaranarayan, and Mendelsohn (1985) reported that the presence of a physical

handicap appeared to be related to the underdevelopment of mastery motivation. Particularly in situations where children need to structure their own activities, children with physical handicaps were less likely to show persistence and curiosity and more likely to spend time blankly staring or aimlessly wandering than were children with normal physical development.

Children who have visual impairments are delayed in exploring their environment and objects, engage in less complex play routines, and engage in role-playing and imitation later in their development than do children who have normally developed visual systems (Sandler and Wills, 1965). Such children characteristically explore objects close to their bodies by biting, licking, or rubbing objects against their faces. This stereotypic behavior can negatively affect social interactions and result in increases in solitary play.

Children with autism present a confounding picture, since these children frequently have compound diagnoses (may be also identified as mentally retarded, language impaired, psychotic, or behavior disordered). Such children commonly display behavior that lacks spontaneity and thus is antithetical to play. Such behavior precludes meaningful interactions with others or play objects and thus results in severe delays in the development of play skills. Rogers (1988) reported significant deficits in the area of symbolic play when children with autism were compared to children of equivalent mental age. She suggested that the presence of some receptive language skills and nonverbal communication skills is related to earlier levels of symbolic play skills and to more complex themes in the play of children with autism. Several

authors (Curcio and Piserchia, 1978; Sigman and Ungerer, 1984; Wetherby and Prutting, 1984) have reported that the play of children with autism is in general characterized by: delays in imitation, less play related to dolls or other persons, and a higher proportion of immature or stereotypical play compared to the play of normally developing children or to children with mental retardation.

SUMMARY

A review of general characteristics of the play of children with handicaps reveals that the quality and quantity of their play is predictably affected by their handicaps. Symbolic play and social interactions are commonly affected, as are certain types of sensorimotor play, although there is great variability among handicapping conditions as well as across persons within diagnostic categories. Practitioners interested in facilitating play as an important means of intervention for young children with handicaps must examine carefully the play capabilities of the children, and provide activities as well as an environment that will facilitate the development of play. An understanding of the potential influence of the handicap on the cognitive development of children will lead to strategies that can reduce that effect.

Only recently have special educators begun to examine play as an educational tool with young children with handicaps. For teachers as mediators, play has been largely an unexplored domain for involving children in activities that can bring about important cognitive change. Play presents opportunities for children and teachers to address the goals of cognitive education including developing representational thought and intrinsic motivation. Play affords


opportunities to develop language, motor, cognitive, and social-emotional processes. Finally, play is simply fun for children. It improves the quality of life, and perhaps that is the best rationale of all for including it in preschool programs for children with handicaps.

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