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Assessment of bilingual children with *inattention, over activity* and *impulsivity* –Challenges and solutions

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Abstract

ADHD is one of the widespread neurological disorders among children. While a substantial amount of research have addressed the issues related to assessment practices and diagnosis criteria among majority language speaking children, ADHD among bilingual children or linguistic minority children has not yet been addressed and discussed so much in the research circles. The percentage of bilingual children with immigrant background in main stream schools in many countries is quite high. Despite this global demographic tendency, underdiagnostisation and assessment of bilingual children with inattention, over activity and impulsivity are being considered to be a psychiatric, psychological and educational challenge. In this paper we address several critical aspects of the assessment practices and medical diagnosis of bilingual children with immigrant background based on a research project. The paper presents also some solutions as an alternative to one-sided intelligence-test based approaches. We stress the importance of multidimensional, multisource and bilingual assessment model for identifying the knowledge-related and language-related elements of the academic learning gap that these children usually experience prior to and during the assessment period.

Keywords: ADHD and bilingual children, academic learning gap, Swiss-cheese metaphor, solid construction metaphor, adopted bilingual teaching.

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Introduction

This paper is about a project-study in which we choosed *multidimensional, multisource and bilingual approach* for assessment of bilingual children with *inattention, over activity* and *impulsivity*. Our aim was to develop a proper strategy for identification and assessments of those bilingual children with linguistic minority background with ADHD or its companion condition ADD. We consider such strategy as necessary for three reasons:

a) To provide bilingual children a medical diagnose when they have neurological disorders and avoid underrepresentation of bilingual children in medical diagnoses
b) To assess and identify their difficulties in order to provide them proper learning conditions
c) To stress the importance of *'medication + pedagogy' -approach* as an educationally and ethically defendable alternative to *'only medication' -approach* and to the widespread *'underdiagnostisation ' -tendencie*s in the field.

Sample

The sample is consisted of a total of six students. All of them have Turkish as their mother tongue, first language (L1), but they grow up in Norway as bilinguals with Norwegian as their second language (L2). Their parents or grandparents have immigrant background.

These students were assessed through a multidimensional, multisource and bilingual model. In the model we used several but complementary methods and various tests and assessment tools in both Norwegian and the students' native language, Turkish. We also obtained additional information from multiple sources (parents, teachers and students themselves). Various relevant theories, approaches and research results represent the project's theoretical framework.

The Norwegian context

Norway's population is 4.9 million. It has a public compulsory education for children at 6-16 years of age. For youths at 16-19 years of age, high school is a right but not compulsory. The country has very few private schools. Relatively high income-tax rates and V.A.T. (25%) make it also possible to have a free of charge and socialized public health care system and an educational system from elementary to university. By low, all the children and youths in the educational system are entitled to get *special needs education* and *treatment* free of charge if they don't get benefit of ordinary classroom instruction because of any diagnosis like *ADHD, ADD, Autism Spectrum Disorder (ASD), General learning disabilities* (Intellectual

disabilities or mental retardation: mild, moderate or severe), 'Learning *disabilities* (Dyslexia, Dyscalculia-difficulties with reading, writing, understanding math, etc.). This categorizing in Norway may differ from the categorizations in other countries. All of them are neurological based learning disabilities. They affect the brain's ability to receive process, analyze and store information. Diagnoses like ADHD/ADD and ASD are diagnoses given by the *specialist physicians* or *psychiatrists* at the habilitation services at the hospitals or at child and adolescent psychiatric services. As a rule all the diagnoses were given by the mentioned medical specialists on the basis of their own medical evaluation and comprehensive assessment done by what is called in the Norwegian system 'Pedagogical Psychological Counseling Services' (PPCS), thus by Pedagogical Psychological Counselors (PPC). As a role PPCs have specialized masters degree in *psychology* or *pedagogical-psychological counseling*. In many cases the category 'General learning disability' was used by PPCS as synonymous Intellectual disability-mild, moderate or severe or Mental retarded. By choosing this type 'short-way' predominantly IQ-test-based assessment, PPCS can recommend extra resources for special need education *without* referring to medical expertise. Thus in these cases a child can get some special education without properly specified diagnose.

ADHD as a specific disorder

ADHD stands for *Attention-Deficit Hyperactivity Disorder*, and is considered to be one of the most common and most explored developmental disorders among children. ADHD is a neurobiological condition caused by dysfunctional dopamine systems (Sagvolden et al., 2005) and is highly inherited. From the educational point of view, ADHD is a complex difficulty. *Inattention, hyperactivity* and *impulsivity* are the three main symptom clusters that characterize the behavior of those with ADHD.

Barkley (1997; 2006) noted that children with *ADHD inattentive type,* has a subgroup. The children in this subgroup have slow behavior, they often use to have daydreaming and late processing speed which is defined as "sluggish cognitive tempo" (SCT). It is not clear whether the SCT-group is a variant of ADHD or whether it should represent a different diagnosis than ADHD. A challenging issue in this debate is co-morbidity which is very common. In research literature on ADHD, there are several approaches and theories regarding how the different difficulties should be understood.

Russell A. Barkley (1997; 2006) and Terje Sagvolden and his colleagues (2005) have a particular focus on those subgroups of ADHD who are *hyperactive-impulsive* (not those who 'only' are *inattentive*), while Thomas Brown (2000) has his primary focus on *inattention* ("ADD"). On the other hand Barkley and Brown devote a lot of focus on *executive functions*

based on cognitive approach, while Sagvolden and his colleagues use the *operant learning theory* as the basis for their research and analysis of ADHD.

ADHD and the executive functions

According to Barkley (1997; 2006) the fundamental difficulties of children with ADHD is failure of self-regulation, specifically related to the lack of inhibition ("brakes"). We can mention three main inhibition areas of problem:

1. The ability to restrain behaviors that are reinforced immediately in time ("proponent response")
2. The ability to stop a behavior that is underway, a behavior which is inappropriate.
3. The ability to not let themselves is diverted by irrelevant events or behaviors ("interference control").

Barkley argues that when inhibition mechanism function properly, the following four executive functions also work properly:

1. Nonverbal working memory: self-regulation and control by visual imagery, time perception, to look back and to anticipate events.
2. Verbal working memory: self-regulation and control through the "inner voice".
3. Self-regulation of affect and motivation.
4. Reconstitution: ability to adapt elements of learned behavior flexibly to the situation and ability to act purposefully.

On the other hand, if the three "braking mechanism" are not as they should be, they do not provide time and space for the four executive functions to work properly -and the result is a wide range of functional impairment in everyday life: the typical ADHD symptoms with "cascades" of adverse effects.

According to Brown (2000), one can use the metaphor of "orchestra conductor" to illustrate the role of the executive functions. These functions include the cognitive processes which help the children to deal with complex actions. Executive functions are closely linked with the ability to promote, activate, manage and integrate a variety of tasks and thus solve the problems purposefully and effectively. Brown argues that the failure of attention is a major causing variable that complicates the executive functions. This affects the child's ability:

a) To organize, prioritize and get started with work

b) To focus and stay focused through the work process (sustained attention)
c) controlling and regulating emotion and motivation, for example, reacting suitable for frustration
d) To make use of working memory in order to stay organized and recall previously learned information, to keep information in memory while processing new information and implementing a goal-oriented activity, to make use of internal call
e) To analyze information
f) To organize previously learned information in new ways-constructing new knowledge, generalize and transfer of knowledge.

ADHD and the altering reinforcement mechanisms

Sagvolden et al. (2006) have focused on a variety of reinforcement mechanisms when it comes to ADHD. They found that the ADHD-group in their research had a different "learning style" compared with those without ADHD, and this "learning style" is the basis for the development of ADHD-symptoms with complications. Their arguments were developed on the basis of animal experiments (comparison of "ADHD-rats' and 'normal rats') and the operant learning theory. They also studied children with ADHD and found support for their arguments. Furthermore they refer to similar findings from cross-cultural and comparative studies (Aase & Sagvolden 2006; Aase 2007). They claim that children with ADHD learn the desired behavior when the *reinforcers* (such as reward or feedback) are presented immediate in time. Children without ADHD can learn even when the reinforcers are not presented in time. But children with ADHD learn less or they have huge difficulties with learning if they are not provided immediate feedback.

Children with ADHD have thus in a sense a "shortened time window" for learning: they have less time to learn than others. The time-factor in this approach does not include only the time it takes from the behavior to an reinforcer, but also the time it takes for a signal (for example, an instruction/information) is being presented to the execution of the behavior and to the moment where reinforcers come. The entire chain-signaling, behavior and reinforcers must be short, and the three elements must occur shortly after each other in time.

In practice, this means that children with ADHD, among other things, need positive feedback to the desired behavior as quickly as possible, as and more frequently than normal. Those with ADHD will also have greater difficulties than those without ADHD to learn the long action chains of time. Research literature also reveals that ADHD varies from being of mild to moderate or severe degree. As a rule, those with ADHD have

additional problems –co-morbidity.

ADHD and the additional problems (co-morbid disorders)

Barkley (1997; 2006) argues that children with ADHD frequently have specific learning disabilities. According to Barkley, the incidence of specific learning difficulties in these children as follows: 21% have reading difficulties and 28% have math difficulties Cohen et al. (1998) found that a large proportion of children with ADHD are delayed in their speech-language development in the first years of life, and that they are more expressive than receptive language difficulties. Around 64% of children with language difficulties appeared to have neurological related developmental disorders like ADHD and Autism Spectrum Disorder as well.

Children with *ADHD and language problems* have more academic difficulties in many areas than those with only ADHD. A surveys study conducted by Tannock and Schacher (1996) has shown that children with ADHD also have language difficulties, particularly difficulties with the structural part of the language. They show poor progress on language-based academic skill areas. They are not very competent in terms of verbal problem solving tasks. They have difficulty with organizing and generating conversations related to specific topics. When they are assigned topics, they talk little. They also have difficulties with remembering and retelling a story. This is considered to be associated with failure of the pragmatic aspects of language. It is important to emphasize here that children with ADHD usually can talk a lot in conversational situations in which the topic was decided by themselves (Barkley, 2006). Difficulty with language and language use are believed to be associated with poor executive functions, that is, organization, regulation and monitoring of their own thoughts and behavior.

Overrepresentation and underrepresentation of linguistic minority students in special needs education

There have been several debates on overrepresentation and underrepresentation of minority students in special education or remedial programs during the last decades in several countries ADHD among children and youths is one of the area of concerns for parents, educators, medical professionals and policy makers. Figures in USA show that around 2-6% in the 1970-1980s and 6-9% of 4-15 years of age in the last ten years of children are diagnosed with ADHD. According to NHI -Survey which was based on data from 1997-2001, Anglo-American children are more likely to be diagnosed with ADHD than Afro-Americans and children from Spanish-speaking homes in USA (NIH, 2003). A study in 2007 shows that there is 70% likelihood that children from Spanish-speaking homes are lesser

diagnosed with ADHD than the children with Anglo-American background, controlling for income and differences in insurance coverage. In the USA-system socioeconomic status is seen an important factor in diagnostic figures. Children from lower-income households are about 18% more likely to be diagnosed with ADHD than those from the highest income bracket (Botelho, 2007). On the other hand Minnis et al. (2003) found in a restricted British study of mostly young South Asian living in South Glasgow, Scotland, that the linguistic minority children with South Asian parents or grandparents were more likely to be diagnosed with ADHD than the general population. Botelho (2007) explain this by the physicians' lack of cultural and linguistic competence. Several international studies have also shown that assessment of linguistic minority children or children with another first language than the language of the mainstream educational system, is a big challenge, and the diagnostic category 'General learning disabilities' and/or different type of mental retardations are the widespread diagnostic categories, and therefore linguistic minorities are overrepresented in this category (Bailey & Owen 2005; Cummins 1989; Donovan & Cross 2002; Harvey-Jumper 2008; Wagner et. al., 2005).

In a Danish study, Glæsel & Kidde (2005: 22) found that bilingual children were overrepresented among those who were given the diagnosis *'General learning disabilities'*. In one of the bilingual group 42% and in another bilingual group 65% had this diagnosis. Furthermore respectively almost one-fourth and one third of the mentioned children also were diagnosed as *'mental retarded'*. The researchers assert that the main reason for this unbalance in diagnostic categories is the too much rely on test results on the Wechsler Intelligence Scale for Children (WISC). This one-sided and mostly biased assessment procedure does not have cultural sensitivity and lacks linguistic considerations.

Bilingual children with inattention, over activity and impulsivity in Norway

In Norway, a study in 1998 showed that bilingual children with linguistic minority background were overrepresented among those children who receive *special need education* either in ordinary classes or special need education classes or in some cases, in special-need-education schools (Nordahl & Overland, 1998). In a recent study in 2008, the researchers found that the percentage of bilingual children in *special-need-education* is 11%, and thus higher that the percentage of the children with majority-language (Norwegian) background who are represented by 7.7% (Nordahl & Sunnevåg, 2008). The mentioned studies did not identify what kind of diagnosis the bilingual children received. Another Norwegian study in 2005 found that a majority of the diagnoses that was given to bilingual children were *'children with learning disabilities'* and the major part of the assessments done by *Pedagogical Psychological Counselor Services* (PPCS)

were based on WISC (Pihl, 2005). There are several challenging issues in the assessment of bilingual children with *inattention, over activity* and *impulsivity* in Norway. The following two tendencies in the field are important to mention:

a) *The use of norm-based assessment* based on WISC and other assessment tools in the children's weakest language, usually their second language, results frequently in diagnose of '*General learning disability'*.

b) Insufficient assessment of children with *inattention, over activity* and *impulsivity* due to the fact that these deficiencies frequently are being interpreted as a result of their limited language proficiency in the majority language and/or as a trait of their family culture.

These two tendencies use to result in *overrepresentation* of linguistic minority children in the category of 'Children *with learning disabilities' among* the children with special needs. On the other hand they are *underrepresented* in all other *medical diagnostic categories*, like *ADHD* and *Autism,* as we discussed earlier.

A multidimensional, multisource and bilingual approach

The above-mentioned problematic issues suggest that this field requires research and studies to develop a better practices and procedures for assessment of bilingual children with *inattention, over activity* and *impulsivity*. In our project we choosed a *multidimensional, multisource and bilingual approach* to assessment of bilingual children with *inattention, over activity* and *impulsivity*. Our aim was to identify those children with ADHD or its companion condition ADD, and thus to be able to recommend adopted teaching measures to the schools. Based on our experiences (one of us is special education senior consultant, the other is psychologist and the third is professor of education) and observations in the field, ADHD (and ADD as its companion condition) is the diagnostic category which is underrepresented among those who were defined as 'children with special need education'.

In addition to those studies we mentioned earlier, Winsnes (2003) argues that many Pedagogical Psychological Counselors (PPC) in the Norwegian system *do not want* to set up an assessment process with regard to *neurological disorders* because a such assessment process is quite complex and time consuming.

In this argument we can see two important points: a) the complexity of the assessment and b) avoidance of proper assessment. The children's bilingual background is usually seen as a big challenge by Pedagogical

Psychological Counselors (PPC), *Child and adolescent psychiatric services* (CAPS) and Habilitation services at the hospitals (HS), because they themselves do not have the matching bilingual competency when the referred child is bilingual. At the same time the field lacks bilingual assessment tools. The combination of the latter with PPC's lack of bilingual competency and the lack of cultural sensitivity in the system usually ends up with monolingual administration of WISC and other tests in the child L2. The widespread consequences of this practice is *overrepresentation* of bilingual students in the diagnostic categories like '*Children with general learning disabilities'* or '*Children with intellectual disabilities'* and *underrepresentation* of bilingual students among those with medical diagnose ADHD, thus lack of adopted educational programs and treatments.

On the other hand our contact with the practicing teachers showed that many teachers expressed some concerns about the behavioral and social-relational problems that some bilingual students had. At the same time the teachers were very concerned about the lack of proper approaches to assessment of children with *inattention, over activity* and *impulsivity.* Furthermore we also registered that many linguistic minority families with immigrant background

a) had very little knowledge about ADHD

b) had skeptical attitudes toward pedagogical-psychological-services

c) were against ADHD-diagnose and the use of drugs (i.e. Ritalin) because they believed that a such diagnose were risky and stigmatizing.

Culturally sensitive outreach to minority families

On the basis of the mentioned facts, we set up our *multidimensional, multisource and bilingual approach* to assessment of bilingual children with *inattention, over activity* and *impulsivity.* The first step in our approach was sending *bilingual information* to linguistic minority parents an invitation to an information meeting if they experienced and/or believed that their children could have *behavioral difficulties, inattention, over activity* and *impulsivity.* Information and invitation was sent to the families through the schools and Pedagogical Psychological Counselor Services. The result was that we met 47 parents at our bilingual (Norwegian and Turkish) information meeting. After the meeting, the parents voluntarily contacted PPCS-offices and reported 11 children between 6-16 years of age. After a screening with ADHD screening scale based on DSM-IV-criteria, we decided to assess 6 of them further with our multidimensional, multisource and bilingual approach. This is due to the fact that the symptoms that these 6

students showed were consistent with ADHD, but none of them were assessed and given the medical diagnosis ADHD. We decided to include all the 6 students in our project in which we adopted multidimensional, multisource and bilingual approach to assessment of ADHD among bilingual minority students.

The tools we used and the results we found

As mentioned earlier our sample consists of 6 children with Turkish as their home language, who have Norwegian as second language. They were between 8 and 12 years of age. The fictive names of the children are the following: *EmreB, MehmetB, ZekiB, CemilB, IlhanB* and *YelizG*. The letter B at the end of the names indicates that the child is a BOY. The letter G at the end of the names indicates that the child is a GIRL. As one can see, there are 5 boys and 1 girl in the sample. In order to assess the students as proper as possible, we used the following assessment tools in their own language:

Russell A. Barkley's anamneses scheme, adapted to Norwegian by Kvilhaug et.al. (1998): This form was modified slightly in order to make it appropriate to our targeting group. DSM-IV criteria for ADHD were used for screening (ADHD Rating Scale IV) and diagnostic interviews with parents and the school separately. The DSM criteria for ADHD were chosen rather than the ICD criteria for hyperkinetic disorder, because the DSM allows distinguishing between subgroups of ADHD. Due to the facts that problems with executive functions is an essential part of the ADHD -related problems, (see also Barkley and Brown's theoretical model of ADHD), we also used assessment form BRIEF (Behavior Rating Inventory of Executive Function) -both parents edition and teacher edition. BRIEF maps the executive functions in everyday life, and provides a function profile related to the following areas (subscales): Inhibit, Shift, Emotional control, Initiate, Working memory, Plan/Organize, Organization of materials and Monitor. BRIEF was translated in Norwegian by one of the public special education resource centers (Statped West) after approval from the U.S. publisher. Parents were helped to fill out the BRIEF in Turkish. Assessment tool was translated in Turkish (L1) by us. In addition to these, we conducted pre-screening and interview questionnaires related to issues like defiance disorder (ODD, Oppositional Defiant Disorder) or severe behavior disorder (CD, Conduct Disorder) in L1. Furthermore we used observations in teaching/classroom settings at school to establish a picture of the student's behavioral functioning in teaching/classroom situations and in other contexts in the school.

As mentioned earlier in the paper, several research studies suggest that children with ADHD have problems with several aspects of cognitive functioning and language. Sattler (2001)) in his discussion of the use of

cognitive tests in assessment of children, stresses that by using WISC, one can get useful, but restricted information about the cognitive capacity of the children and to what extend they are able to use this capacity in a everyday live. It's necessary to gather more data and information particularly about the child's prior and present teaching-learning conditions at the school, his/her social network and health conditions. We want to add to Sattler's arguments the following: It's also of utmost importance that the tests and the questionnaires one uses in the assessment are in a language which the child and his/her parents can understand. Otherwise it can be a risky and misleading assessment. Therefore we used the following tests in both languages to assess cognitive functioning and language of the children:

Subtests of WISC-III (WISC-IV was adapted to the Norwegian context at a later date): Mapping the verbal comprehension, perceptual organization, attention, working memory and processing speed. The test was administered in Norwegian, but three subsamples verbal (information, similarities and comprehension) were taken in both Norwegian (L2) and Turkish (L1). In order to be able to see the difference between the traditional IQ-focused assessment based on WISC and our multidimensional, multisource and bilingual approach, we also conducted the entire WISC-III in L2 (Norwegian). The result of the traditional monolingual (Norwegian) testing by WISC-III resulted in the following: Only 1 of the 6 students had 100 IQ Std.score and thus only one of the six children had IQ within the average. The rest, five of six, received 76-55 IQ Std.score, which means that they, on the bases of traditional monolingual testing in the child's second language, could be defined as child with 'moderate to low'-level IQ. Thus the most likelihood diagnosis they could get would be 'Children with General Learning Disability' or 'Children with intellectual disability'. We consider this type of practice as insufficient and misleading.

WISC-II-Subtests: Information, similarities and comprehension conducted in two languages

In order to avoid misdiagnosis, we decided to pay a great deal of attention to assessment of their language proficiency. Anamneses-interviews with parents and teacher reports showed that these children were academically behind their peers. Whether they would receive medical diagnose ADHD or not, they were in need of adopted teaching. Therefore assessment of their bilingual proficiency was an important step for initiation of adopted teaching based on individualized educational plans (IEPs). The following three figures show the results of the language related subtests of WISC-III which was administered in both languages:

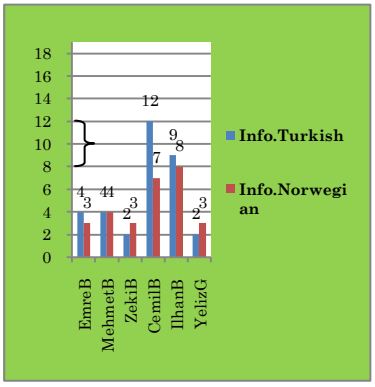


Figure 1: Results of the Subtest WISC-III: Information

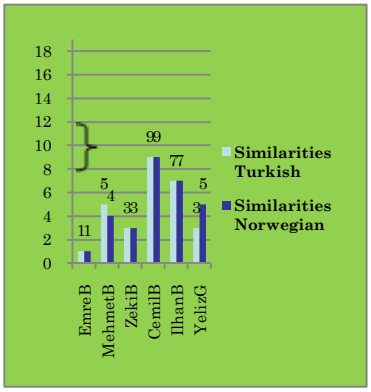


Figure 2: Results of the Subtest WISC-III: Similarities

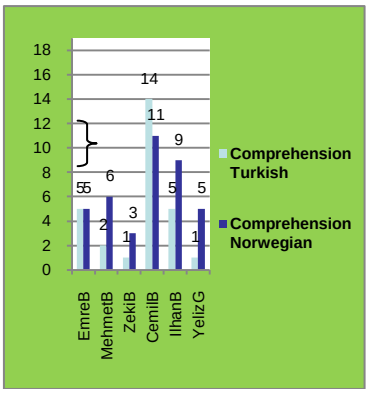


Figure 3: Results of the Subtest WISC-III: Comprehension

As one can see from the figure 1, 4 of 6 children obtained low scores in both languages. 2 of the children obtained scored which are within the *normal-area* in both languages (L1: Turkish & L2: Norwegian). Figure 2 shows that only 1 student is in '*normal area'* (8-12). The majority of them need help to develop their abilities for verbal conceptualization and verbal expression. Figure 3 shows that only 1 of 6 is in *average level* in L1 and L2, and 1 of 6 is at this level only L2. The overall results are not satisfactory at the mentioned three Verbal IQ related subtests of WISC-III. What about the students' Performance IQ related subtests? The following figure shows the results.

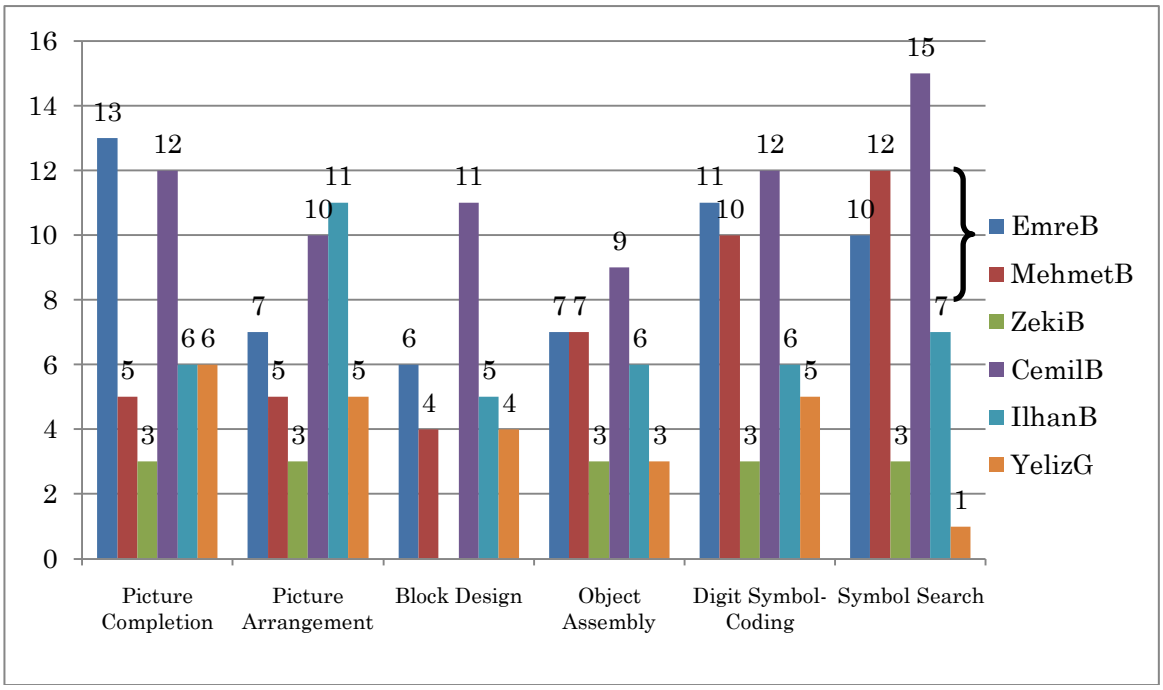


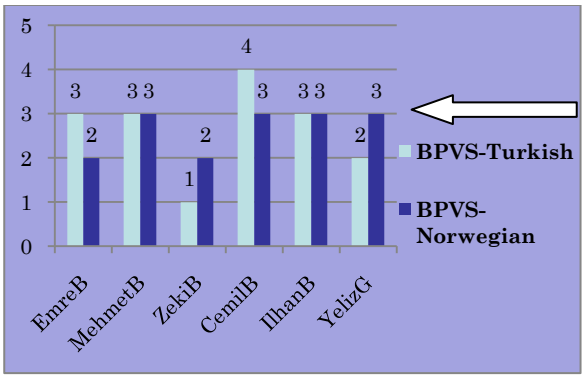
Figure 4. Results of the Performance IQ related subtests

As one can see in the figure 4, the results that the students achieved at Performance IQ related subtests are not satisfactory even they are to

some extend slightly better than the results they achieved at Verbal IQ related subtests as it was shown in the earlier figures. On the bases of these results, we want to say that the widespread belief that bilingual/linguistic minority students score significant better in Performance tests than Verbal tests does not get enough support in our research. The overall picture is satisfactory neither in verbal subtests nor in performance subtests. Our interpretation of these results is this: Not only Verbal subtests, but also Performance subtests prerequisite systematic school-based learning and/or systematic home/environmental academic support. One cannot perform logically and correct in performance subtests if he/she does not have prior knowledge and/or prior experience which are relevant for the tasks of the subtests. The educational interpretation of the results from Verbal IQ-related and Performance IQ-related subtests of WISC-III is that these children have problems with language and prior knowledge. Their tasks-related language skills and background knowledge are weak. These language and prior-knowledge related problems are both environmental and school related. At the same time their ADHD reinforces these problems. As a group they need social and cultural opportunities and enriched language environment in both languages. They are also in need of extended reading opportunities and teaching-learning opportunities at school in which they can have comprehensible input and thus opportunities for meaning construction and learning. This argument is in accordance with the comments made by American Psychiatric Association in DSM-VI-TR (2000): *"Inadequate schooling can result in poor performance on standardized achievement tests. Children from ethnic or cultural backgrounds different from prevailing school culture or…* [school in which the medium of instruction is not the primary language] *and children who have attended class in schools where teaching has been inadequate may score poorly on achievement tests" (p.51)*

BPVS: Vocabulary

British Picture Vocabulary Scale (BPVS): The test maps the impressive vocabulary. This test was translated and adopted to Norwegian context by the Department of Special Education (University of Oslo). In our project we administered the test both in Norwegian and Turkish.



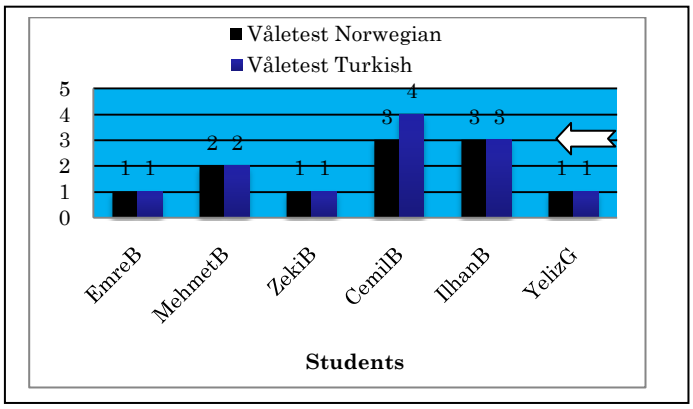
BPVS:
5: Very high
4: Moderate high
3: Moderate
2: Moderate weak
1: Very weak

Figure 5: Results of BPVS

The tendency is the following: No one has bilingual vocabulary above *moderate level*. Only one (CemilB), has vocabulary level *above average*-only in L1. Almost all of them need environmental and educational opportunities for vocabulary development, verbal conceptualization, verbal expression, extended reading and abstract thinking which is closely related to vocabulary and conceptual development.

Våletest: Auditive learning by repetition

Våletest: This is a Norwegian test that maps the ability for auditive learning by repetition which is closely related to verbal learning and memory. The test may also give an indication of attention problems when learning curve is variable or falling. This test was also administered in two languages. The Turkish version included some other words than the Norwegian version, but the words had the similar vocabulary complexity and all the words are in the same word-category as in the Norwegian version.



4: Higher level within normal area
3: Average
2: Lover level within normal area
1: Very low level

Figure 6: Results of Våletest: Auditive learning by repetition

As one can see in the figure 6, only 2 of 6 students are at *average level* and 4 of 6 are at *lover level* or *very low level* with regard to *verbal learning capacity*. These results indicate that the majority of the children need help for *verbal conceptualization, conceptual development and extended reading opportunities* in both of their languages (L1 and L2). As one also can see in the figure, except one student (CemilB), all the other students have similar vocabulary weaknesses in both languages.

NEPSY: Wordflow-Semantic/Word mobilizing

- *Wordflow test:* A subtest of the NEPSY neuropsychological test battery. This subtest maps the word-mobilization and word finding/word flow at semantic and phonological area. This test was also given in both languages.
- *Memory for retelling:* a subtest of NEPSY. This subtest assesses the free recall of a story being read to the student, and recall by the help

of the control questions. It was administered in both languages, but the Turkish version had another story with the same length, aim and complexity.

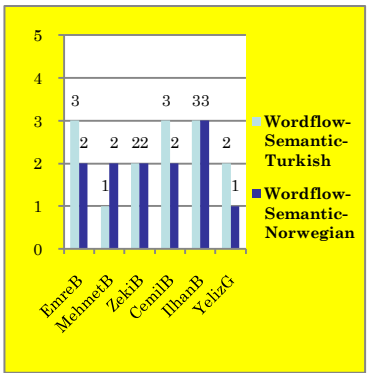


Figure 7: Results of Wordflow-semantic

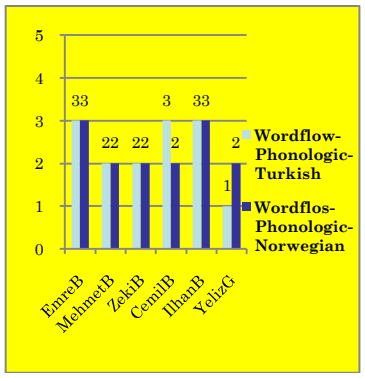


Figure 8: Results of Wordflow -phonologic

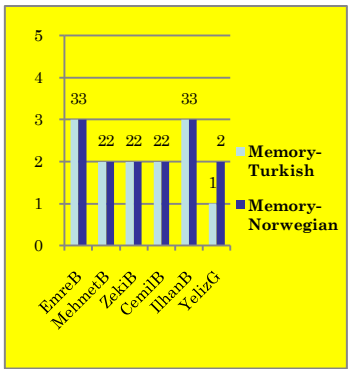


Figure 9: Results of Memory for retelling

Levels of the scores: 1: Extreme weak, 2: Weak, 3: Average, 4: Strong and 5: Very Strong

As one can see in Figure 7, 3 of 6 students are at *average level* only in L1; one of them is at this level in both languages. 5 of 6 are at *weak* level in L2 with regard to word mobilizing. None of them is at *strong* or *very strong* level in both languages. When it comes to wordflow phonologic, Figure 8 shows that 3 of 6 are at *average* level only in L1, two in both languages. 3 of 6 are at *weak* or *extreme weak* level in L1, and 4 of 6 are *weak* in L2. None of them is at *strong* or *very strong* level in both languages. Figure 9 shows that only 2 of 6 are at *average level*. 3 of 6 are at *weak* level in both languages. Furthermore we see that 1 of 6 is at *weak* level in L2 and *extreme week* level in L1.

Findings, discussions and conclusion

Parallel with our *multidimensional, multisource and bilingual assessment* efforts, we collaborated with specialist physician. Based on DSM-IV-criteria, 5 of 6 members of our sample were given the medical diagnosis of ADHD/ADD. One of the boys, CemilB, did not receive any medical diagnose even he also had problems in several areas of his language development, conceptual development, word mobilization and memory in two languages. We, as a research team and specialist physician concluded that the reason for the signs of inattention, over activity and impulsivity that this boy (CemilB's) had, was due to family-related problems and his short background in Norway. He only had lived in Norway only two years when we initiated the project. The other 5 students were born in Norway.

Our educational interpretation of these results is the following: These 5 students with the medical diagnoses ADHD/ADD, as a group, are quite

weak with regard to language related skills such as word mobilization/word flow and word finding at the semantic and phonological area in two languages. They, as a group, have difficulties with memory for retelling. In order to help them, environmental factors in general and teaching-learning conditions at the schools in particularly must be improved. Educational measures and/or intervention initiatives must create adopted teaching and learning conditions in which the bilingual students who have problems with *inattention, over activity* and *impulsivity* will be able to develop their abilities for verbal conceptualization, verbal expression, short term memory and long term memory. They must be provided with linguistically enriched environment, access to books and other cultural opportunities, and last but not least adopted teaching conditions in two languages. These educational measures must ensure an age adequate improvements in the developmental areas such as v*ocabulary, verbal expression, general knowledge, conceptual knowledge, auditory learning, retelling and comprehension and reasoning.* Learning and development in these areas cannot be left to coincidence. Medication helps them to be open for and receptive to learning but it's the school that can create learning conditions in accordance with their difficulties and the *academic learning gap* that these children usually ascribed. Therefore we suggest that *medication + adopted bilingual teaching* must be seen as a viable educational strategy. *Academic learning gap that these children already have ascribed* indicates that they already have, what we want to call, *knowledge- conceptual-vocabulary-holes* in their common underlying *prior knowledge* and *academic language proficiency base* for further development of L1 and L2.

Cummins (1984) and Cummins and McNeely (1987) use the *Dual iceberg* metaphor to illustrate the common underlying proficiency for the language development of bilingual children.

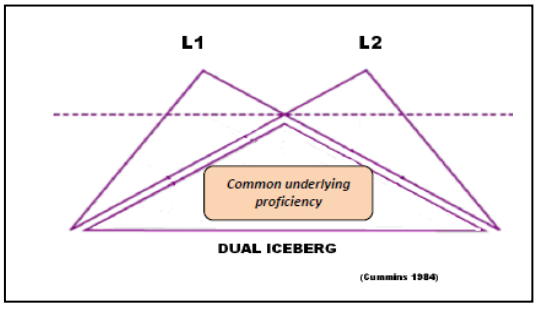


Figure 10: Dual iceberg model

Our argument is that while these children are experiencing problems with *inattention, over activity* and impulsivity, they at the same time have missed learning opportunities and thus experienced *academic learning-gap* compared to their classmates.

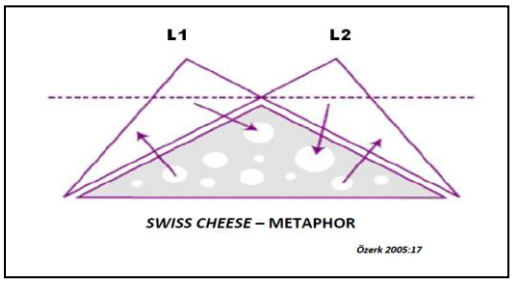


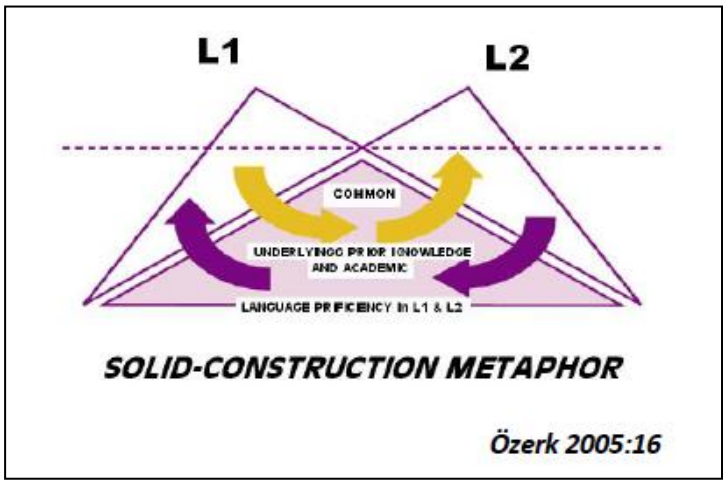
Figure 11: Swiss Cheese-metaphor

Özerk (2005: 17) presented *Swiss cheese*-metaphor to illustrate the *holes* in many bilingual children's conceptual knowledge, prior knowledge and vocabulary-base when they are not provided culturally sensitive bilingual teaching.

As one can see in the *Swiss cheese-metaphor*, externally it appears to be a w*hole,* but it has many *holes* in their conceptual knowledge, prior knowledge and vocabular -base.

These children were not provided by proper social and educational opportunities to utilize their two languages to strengthen their conceptual, knowledge and vocabulary development. A development may in turn contribute to their development of cognitive academic language skills. We want to argue that through bilingual teaching and training, they can strengthen and utilize common underlying *prior knowledge* and *academic language proficiency* in L1 and L2. The positive outcome of this educational approach, in our view, most likely will be creation of learning condition that can help them to utilize L1 and L2 and improve the *common underlying prior knowledge* and *academic language proficiency* in L1 and L2.

As Figure 12 shows, by utilizing L1 and L2 in education, one can provide the students with the conditions in which L1 and L2 can reciprocally support each others development through a solid constructed common underlying prior knowledge and academic language proficiency.



We suppose that teaching-learning and training conditions for bilingual children with ADHD will help them to catch up their classmates by reducing and eliminating the academic learning gap. Such pedagogical process will create and strengthen a solid fundament for their future learning.

Figure 12: Solid-construction metaphor

We will add another figure (Figure 13) below to illustrate the most likely result of such pedagogical approach**.** Our multidimensional, multisource and bilingual model for assessment of linguistic minority children with ADHD/ADD suggests that traditional monolingual and IQ-centered assessment of these children can cause misdiagnosis and/or lack of proper teaching and training for those children.

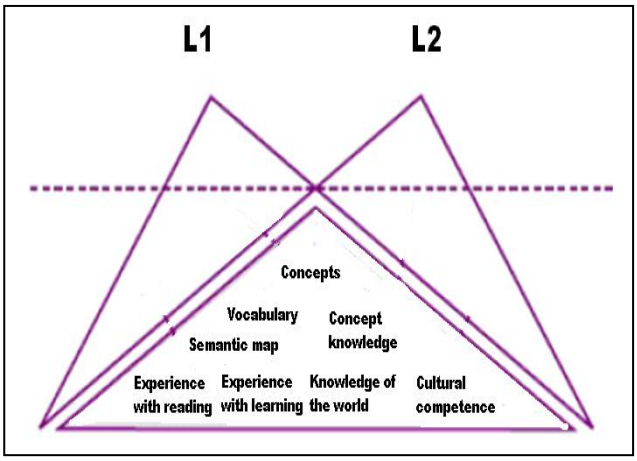


Figure 13: Constructing bricks of the fundament of bilingual development

It's a widespread phenomenon that late diagnosis and late intervention cause *academic learning gap* for these children. Assessment takes time. Academic learning gap is in many cases is inevitable. But improper diagnosis and late intervention can have serious consequences for those children. Through a *multidimensional, multisource and bilingual assessment*, one can identify the strengths and weaknesses, thus the needs of the bilingual children with ADHD. Our project suggests that several *learning-dependent elements* must be in place in order to ensure an age adequate development by those children. Figure 13 illustrates the *necessary language related, knowledge related* and *conceptual development related elements* that must be in place for an age adequate development. Medication of children with ADHD is not an aim, but a mean. Medication makes most of the children with ADHD more receptive for learning, more attentive and less impulsive. These factors are important contributors for learning, but adopted bilingual education is needed to utilize these positive factors as well as the children's bilingual potentials. Therefore we want to conclude that '*medication + adopted bilingual pedagogy'* is a way to go when the bilingual children receive medical diagnosis based on a multidimensional, multisource and bilingual assessment.

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