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Title: Time perception, Executive functions, Temporal organization and Participation among students with and without learning disabilities.

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Abstract

University students have to cope with complicated demands. In addition to their academic tasks, they still have to fulfill assignments relating to their work, family and friends. In order to function efficiently at different life situations, the students have to develop skills that contribute to efficient use of time (Dahan, Hadas-Lidor, & Melzar, 2006; Dahan, Hadas-Lidor, Melzar, & Roitman, 2008), including an adequate time perception and temporal organization (Rosenblum, Accepted).

Many students with learning disabilities (LD) have experience significant difficulties in time perception (Dahan et al., 2008) and temporal organization (Vogel, 1989). Difficulty in time perception can be associated with deficiency in performing executive functions (Ustun, 2007; Brown, 2009), which according to several studies characterize LD (Brosnan, et al., 2002; Helland & Asbjornsen, 2000; Lazar & Frank, 1998; Roitman, 2009). Other studies reach different conclusion (Horovitz, 2004; Moores, Nicolson & Fawcett, 2003 ; Reiter, Tucha & Lange, 2005 Sluis, Jong & Leij, 2004). It is, therefore, not entirely clear if deficiencies in time perception associated with executive functions, and if both of them characterize LD.

The “International Classification of Functioning, Disability and Health” (ICF) (World Health Organization- WHO, 2001) and the “Occupational Therapy Practice Framework” (OTPF) (American Occupational Therapy Association- AOTA, 2002) are the theoretical frameworks of this study. These sources describe how disorder, such as LD, impairs body functions and structures, limit activities and restrict participation. It is still, however, not entirely clear weather impaired time perception and executive functions characterize LD, and how those deficiencies impact time organization and participation.

Study objectives: (1) Examine whether students with LD experience difficulties in time perception ability, executive functions, temporal organization and participation, compare to students without LD; (2) Examine the correlations between temporal organization and time perception ability, executive functions and participation, within each of the research groups.

Study hypothesis: (1) differences between students with LD and the members of the control group will be found in the performance scores of time perception ability, executive functions, time organization and participation; (2) Significant correlations will be found between certain aspects of temporal organization and time perception ability, executive functions and participation.

Participants: the reaserch population comprised 64 BA students from several academic institutions in Israel, age 20-30. The students were divided into 2 groups; 33 students were diagnosed as LD and 31 students without LD, according to their own observation and report. The two groups matched by age and gender.

Means of research: (1) demographic questionnaire, (2) time perception activity, (3) Time organization and participation questionnaire (TOPS) (Rosenblun, Accepted), (4) Behavior Rating Inventory of Executive Function- Adult Version (BRIEF-A) (Ruth, Isquith, & Gioia, 2005) and (5) participation questionnaire (Sherfi & Rosenblum, in process).

Procedure: the participants were asked to fill the questionnaires and perform time perception activity, at the order above. Each participant got a link to website, which enabled him to fulfill the questionnaires and perform the task anonymously.

Data analysis: Differences between the students with LD and the members of the control group were analyzed through t test and MANOVA test. Man-Whitney test and Chi-Square distribution were used to examine specific significant differences. Correlations between those variables were evaluated by Pearson coefficient.

Results: (1) significant differences were found at time perception ability, executive functions and time organization, between the two reaserch groups; students with LD coping with significant difficulties at those abilities. No significant differences were found in the extent of participation.

Significant differences were found, however, in students' attitudes toward participation.

More students with LD preferred to avoid participation in Instrumental Activities of Daily Living (IADL) and social-cultural leisure activities. Significant differences were also found in students' attitudes toward participation in specific activities. (2) Significant correlation was found between aspects of time organization and executive functions, in each one of the research groups. No significant correlation was found between most aspects of time organization and time perception ability. Significant correlation was found between difficulties to organize in time under various stimuli and reduced participation in social-cultural leisure activities, and between difficulties to organize in time during changes in routines and reduced participation in IADL activities.

Conclusions: the findings of this study indicate that students with LD meet more with deficiencies in time perception ability, executive functions, time organization and negative attitudes toward participation at specific areas of occupation. These findings support the basic assumption of the ICF (WHO, 2001) and OTPF (AOTA, 2002), concerning the implications of body functions impairment on activity and participation. They help us understand the impact of learning disability on participation and daily performance of students with LD. The identifying of meta-cognitive skills as the source difficulties in performing executive functions, together with time organization deficiency, helps to direct and focus the occupational therapy evaluation and intervention in adults with LD.