

Effects of Post Traumatic Stress Disorder
on Second Language Acquisition

Michael Abraham

Hamline University

This paper is an analysis of the effects of Post Traumatic Stress Syndrome (PTSD) on second language acquisition. Three studies are analyzed in this paper. A common thread between them is that they all feature participants who have been exposed to political and war violence. Two of the three studies deal with participants that are resettled refugees in the United States at the time of their participation. The third one's participants are war veterans of the United States military.

As an ESL instructor in the Twin Cities metro area I was interested in this area of study because PTSD is a common diagnosis experienced amongst the large East-African population of resettled refugees in this area. Many of whom are classified as ESL students in K-12 institutions. Alas, despite the growing numbers of resettled East African refugees throughout the western world and the commonality of PTSD and other mental disorders in this population I was unable to find any study that dealt specifically with the effects of PTSD on second language acquisition of this population. I was surprised to find many studies that dealt with causative factors and inhibitors of second language of this population, but none that took PTSD into account as a possible factor.

Therefore I limited the studies I focused on to ones that dealt with effects of PTSD on second language acquisition, or an important aspect of it, and analyzed participants who had been exposed to war and political violence, as oppose to suffering from PTSD as the result of domestic abuse, neglect, or traumatic incidents like car accidents.

This paper is formatted by using the title of the studies as a subheading preceding the analysis and discussion of the study, the author(s) of the study is also listed after the title. All quotations therein are taken from the text of the study's report unless otherwise noted. At certain points in the analysis of the second and third studies reference is made to the previously analyzed studies and some comparing and contrasting takes place.

Dichotic listening performance suggests right hemisphere involvement in PTSD

ARVE E. ASBJØRNSEN

This study by Arve E. Asbjørnsen of the Bergen Cognition and Learning Group at the University of Bergen, Norway focuses on “language laterality as measured with dichotic listening (DL) to consonant-vowel syllables (CV syllables) in refugees with post-traumatic stress disorder (PTSD).”

A previous study associated PTSD with abnormal or altered cerebral laterality in PTSD, particularly associated with increased alexithymia, which is an inability to identify and describe emotions in one’s self that results in dysfunction in emotional awareness, social attachment, and interpersonal relating [Gerhards, Yehuda, Shoham, & Hellhammer, 1997 – cited by Asbjørnsen]. Others found increased frequency of mixed laterality among combat veterans with PTSD [Spivak, Segal, Mester, & Weizman, 1998 – cited by Asbjørnsen].

Dichotic listening features simultaneous stimulation of the right and left ear by different sounds. It has proven to be effective in the assessment of language lateralization in a broad range of studies (Hugdahl, 1988 – cited by Asbjørnsen). According to Asbjørnsen, “The typical finding is a right ear advantage for verbal stimuli presented dichotically [Kimura, 1961], and a left ear advantage if stimuli are non-verbal [Bryden & MacRae, 1988; Bulman-Fleming & Bryden, 1994].” Previous studies have demonstrated that people with affective disorders frequently exhibit atypical patterns of dichotic listening. For example, “patients with different subtypes of major depression produce a smaller right ear advantage.” Conversely, “patients with anxious depression have been

reported to show *increased* right ear advantage for consonant-vowel (CV) syllables, due to decreased left ear reporting [Bruder, Wexler, Stewart, Price, & Quitkin, 1999].”

Asbjørnsen states that “anxiety and depression are frequently found as co-morbid conditions in PTSD. Therefore he believes that the results from the Bruder study indicate that PTSD victims could be expected to exhibit “decreased left ear reporting, and...an increased right ear advantage.” His study is the first to test brain asymmetry and language lateralization using dichotic in victims of PTSD.

The study features 22 participants with PTSD and a control group with 23 participants without a diagnosis of PTSD, who are referred to as the NPC group (non-psychiatric controls). All of the participants had similar experiences of war and political violence. Participants were from former Yugoslavia, the Middle East (author’s phrasing, countries were not specified), Chile, and Sri Lanka. There were equal members from each place in both the control group and the PTSD group. The researchers determined that differences on age, type of trauma, time elapsed since the traumatic events, and “pre-morbid intelligence” were not of significance, but little detail is made as to how those conclusions were drawn. All the participants were recruited casually through the posting of flyers and holding of informational sessions at public and private health facilities throughout Norway. The participants were not paid for their participation.

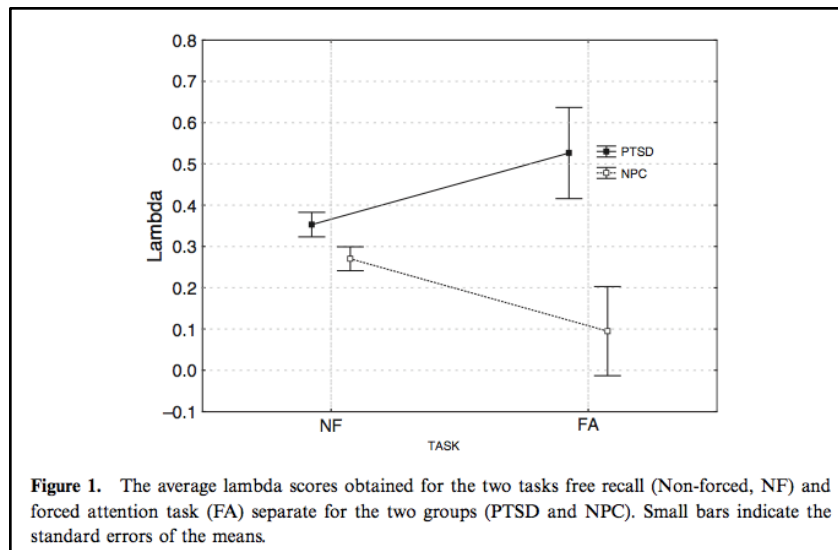
Criteria of exclusion from the study were thorough and guard the studies results against a variety of possible non-PTSD related factors. They were “(a) organic brain damage or other central nervous system disease; (b) torture in the form of electrical stimulation to the head, or head blows resulting in loss of consciousness for more than 30 minutes (men reporting beatings with blows to the head were not eliminated from the sample, because such beatings were commonly experienced by most from the Middle-East); (c) impaired sight or hearing; (d) substance abuse; (e) use of cardiac medications

and other medication known to have a potential impact on cognition; (f) acute pain and other conditions that might affect baseline physiology, such as acute medical illness like myocardial infarction or stroke; (g) including the use of beta- blocking agents, alcohol, or drug intoxication (Gerardi, Keane, Cahoon, & Klauminzer, 1994).”

Participants were diagnosed with PTSD using the Clinician-Administered PTSD Scale for DSM-IV (CAPS). This is a widely-used 30-part structured interview developed used to diagnose PTSD as well as assess the onset and duration of symptoms, subjective distress, impact of symptoms on social and occupational functioning, and improvement in symptoms through questions and rating on a 5-point scale (0-4). Participants were also given a Symptom Checklist-90 Revised to use as a gauge of general discomfort. They were also administered the Montgomery and Asberg Depression Rating Scale test to measure severity of depression. They set a cut-off for inclusion in the NCP group on this scale at 20. The assessment tools were all translated into the language in which the participants reported the highest degree of fluency.

The study used six basic CV syllables, /b/, /d/, /g/, /p/, /t/, and /k/ paired with the vowel /a/, as stimuli for the dichotic listening. The syllables were put into 36 pairs and read by a male voice and recorded onto a CD for participants to listen to. The intonation and intensity of the reader was held constant. It was listened to by the participants through headphones on a recorded cd, all at the same decimal level, whereby the different CV syllables would be read into different ears through the headphones at the same time. There was a “free recall” task (referred to as NF, or non-forced, in the study) where participants were asked to report the CV syllable heard most clearly on each trial. Then there was “forced attention” (referred to as FA in the study) task where they had to report the syllable heard in either the left or right ear.

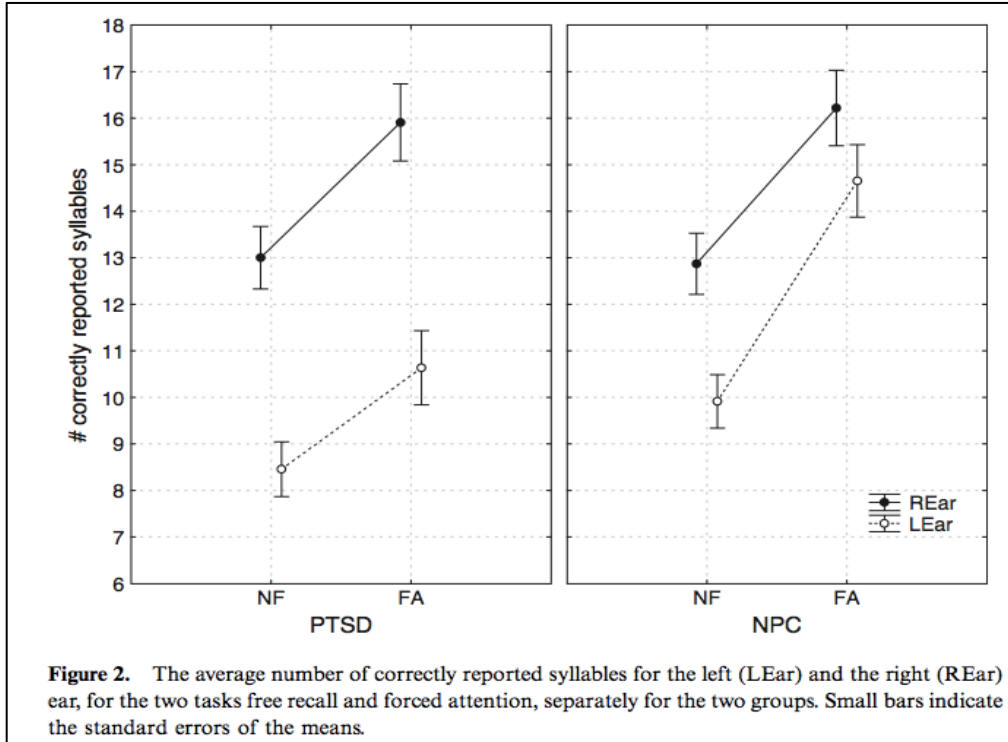
This set up gives the experiment a design of measuring 2 different groups, performing 2 different tasks, with 2 different receptors, a 2x2x2 split-plot design of factors. The researchers used the lambda coefficient based on right and left ear accuracy for both tasks to assess the laterality of the participants responses. Lambda is used to indicate the association between two variables with 0 indicating no association and 1 indicating a perfect, or absolute, association.



The researchers predicted an increased laterality in the PTSD group, as well as an advantage in the right ear, and these were confirmed by the results. The graph above shows the results of an analysis conducted by the researchers “with the lambda as dependent variable in a Group (PTSD vs NPC) x Task (free recall vs attended ear scores) mixed design, with Group as a between factor and Task as a repeated measure within participants.”

Figure 1 from the study, above, shows that there is a greater association between accuracy and inaccuracy in the different ears for the PTSD group than for the NPC group in both tasks, and especially for the forced attention task where participants had to say which ear they heard the a certain syllable in. Figure 2, below, shows that the PTSD group had a higher accuracy, or advantage, with the right ear, as predicted by the researchers. It

is noted in the study that right ear advantage is generally found in dichotic testing. But these results show that the advantage is greater for the PTSD group than the NPC group.



It is especially important for the study that the difference was so stark in the forced attention activity because it has been previously theorized that having directed attention in the experiment will reduce attention as an arbitrary influence upon the results. Also of significance, and shown in table 2 above, is that the PTSD group has a much lower mark for the left ear in the NF activity. This lends support to the argument that PTSD victims experience interference with processing of left ear input as a result of increased activation of the right ear processing.

Post-Traumatic Stress Symptoms, Language Acquisition, and Self-Sufficiency

A Study of Bosnian Refugees - KENNETH CORVO AND JAIA PETERSON

Unlike the previous study this one was not experimental. However, like the previous one it consisted of participants who were refugees and diagnosed with PTSD after experiences of war and political violence. The previous study was attempting to confirm a hypothesis about the nature of the human brain's functioning while carrying PTSD. On the other hand, the objective of this study was to investigate the state of a specific group of refugees (Bosnians in the Syracuse area of New York), their economic self-sufficiency, their ability to learn English, and how these aspects of their lives relate to their mental health status.

While the study is looking at a specific refugee group it still aims to find generalizable results about mental health status's relation to language acquisition and economic self-sufficiency in refugees. Despite the fact that this study is exploratory in nature, the researchers still approach it with a hypothesis. Which is that "there would be inverse relationships between trauma-related symptoms and language acquisition." The researchers also anticipated further that increased language acquisition would also relate positively to lengthier employment.

The study participants were 34 Bosnian refugees in New York State that had arrived in the United States from 1 to 15 months prior to the time of the study with an average of arrival time of 8.7 months prior. Their average period of previous education was 10.6 years. They were asylum seekers from the Bosnian/ Herzegovina war of the 1990s. They were recruited for the study by a Catholic refugee resettlement program. Their participation in the study consisted of undergoing several different diagnostic and evaluative interviews, all of which were done in they year 2000.

The participants were diagnosed with PTSD using the Hopkins Symptoms Checklist (HSCL-25), which has a list of 58 symptoms and asks "How Much Are You

Bothered By...” before each symptom and the respondent chooses an answer on a scale of 1-4 (not at all-extremely). There may be some question as to whether or not HSCL-25 is the best tool for diagnosing PTSD as many other studies report using it as a measure of depression severity (though, as previously mentioned, PTSD and depression do often go together) and it also seems that later studies tended to use the CAPS assessment. The total data gathered by the researchers were “HSCL-25 scores for overall trauma symptoms and depression, number of jobs held, months of employment, and measures of English proficiency and English as a second language (ESL) success. The relationships between age, years of education, length of stay, sex, and marital/ residential status; and mental health measures, language, and employment were also assessed.”

The final result of the study was that “using both mental health cutting scores to compare differences in language skill (Mann-Whitney U) and correlation statistics with actual HSCL-25 scores (Spearman’s rho), no association between mental health indicators and English language acquisition was found.” They also found that there was no association between mental health and employment. These results are in contrast to what the researchers had hypothesized. However they did find “several significant relationships...between language skill and employment and what had been intended to be the control variables of length of stay and age.”

There appears to be several issues with this study. First of all, the reliability of the study could be questioned by the relatively small sample size of participants, only 34, the International Crisis Group estimated in 1997 there are roughly 1.2 million Bosnian refugees spread throughout the world (Kibreab, 2003). Furthermore, it is odd that the study never describes the assessments or methods used to measure English proficiency. They mention that participants are assigned a rating of 1-4 on an ordinal scale of their English proficiency, but there is no mention of the particular measurement tool used to

rate the participants. The exclusion of such pertinent information seems odd and makes it impossible for one to assess the validity of their results.

Also, both the precise objective and something of the methodology appear to be somewhat muddled. On one hand the summary and introduction of the study state that it is being undertaken to “explore the nature of the relationship between mental health status, English language acquisition, and economic self-sufficiency among recent Bosnian refugees,” but while the study is self-stated to be exploratory in nature it also proposes to be testing a specific hypothesis. These things are not necessarily mutually exclusive, but the primary objective is a little unclear. Part of that lack of clarity is due to the fact that the researcher’s hypothesis is explained and articulated but the methodology of testing that hypothesis is not made entirely explicit. The only mention of a control against the hypothesis is in the quote above from the “Discussion” portion of the report when they mention that there were, ““several significant relationships...between language skill and employment and **what had been intended to be the control variables** of length of stay and age.” This is the only mention that length of stay and age were being used as control variables and there is no elaboration as to the reasoning behind choosing those as control variables.

Longitudinal effects of PTSD on memory functioning

KRISTIN W. SAMUELSON, THOMAS C. NEYLAN, MARYANNE LENOCI, THOMAS J.
METZLER, VALERIE CARDENAS, MICHAEL W. WEINER, and CHARLES R. MARMAR

There appears to be an abundance of literature and studies on the relationship between PTSD and memory, more so than studies analyzing the relationship between PTSD and language acquisition. Memory, however, is a key component of second language acquisition and processing. From *Understanding Second Language Process* edited by

Zhaohong Han:

“Baddeley (2003: 189) defines working memory as ‘the temporary storage and manipulation of information that is assumed to be necessary for a wide range of complex cognitive activities’. The amount of activation needed to support processing or storage is limited and varies from person to person (Just & Carpenter, 1992). Whenever such capacity becomes insufficient to maintain the level of activation necessary to perform a specific task, processing will slow down and/or storage will decrease. Thus, people with larger working memory capacity will process linguistic information more quickly and effectively than those with smaller working memory capacity.”

Many studies have found that PTSD victims experience deficits in working memory. This study stands out as one of the few that assesses longitudinal changes in memory functioning of PTSD victims. This study examined 47 war veterans, the majority of which were veterans of the Vietnam War, who had all partaken in one of two prior studies. On average the participants were reassessed 34 months after the previous study they had partaken in, with a range of 24 to 60 months.

In both the previous studies and this one PTSD was diagnosed using the CAPS scale. The participants were also assessed for their lifetime drinking history and other mental health symptoms. At the time of both studies the participant’s verbal memory was tested using The California Verbal Learning Test (CVLT), which measures the ability to recall word lists. Short and long-term visual memory were assessed using the Faces I, Faces II, Family Pictures I, and Family Pictures II subtests of the Wechsler Memory Scale-Third Edition (WMS III). These tests essentially consist of being shown photos or pictures of people and scenes and then being asked to recall information about them. The Digit Span and Spatial Span subtests of the WMS-III were given to test both verbal and visual-

spatial working memory. In the Digit Span subtest, the respondent has to repeat back a series of digits in the same sequence the proctor presented, and in the reverse order as well. In the Spatial Span subtest, the proctor taps cubes on a board in a certain sequence, and the respondent has to tap the blocks in the same sequence, and also in the reverse order. To assess baseline intellectual functioning the participants were given the Vocabulary subset of the WSM-III. There was also a thorough and comprehensive exclusion criteria that whittled the participants down to 47 and the participants were instructed not to consume alcohol before testing and were administered breathalyzer tests and had urinalysis for toxicology done beforehand to assure sobriety. The results of two participants were excluded due to the presence of toxicology.

Amongst the 47 participants 25 were diagnosed with PTSD and 22 were not. The non-PTSD group acted as the study's control. The researchers analyzed the data using paired *t* tests for each group separately from the first time point of testing (one of the two previously done studies) to the second point of testing (the current study). Following that, in order to assess whether or not changes in memory performance were different between the two groups, the researchers analyzed data of the measures repeated in the two studies using "random intercept linear mixed-effects regression models, with each primary neuropsychological variable as the outcome."

It appears the researches made were careful to consider the possible effects of many different variables in their analysis in an effort to isolate PTSD as a causative factor of memory decline. Because a previous study had found a longitudinal effects of age in a study of elderly participants (holocaust survivors) the researches used their date to test whether or not cognitive decline in PTSD victims was influenced by age by testing for an interaction of age x group x time. Additionally, "potentially confounding demographic variables (e.g., education) that were found to be different between the two groups were

entered into each model as covariates.” This was important because the non-PTSD group had an overall higher education level than the PTSD group; they note that other studies have frequently found education level to related positively to memory performance. To ultimately test if memory change was related to PTSD severity they “conducted Pearson product correlations, correlating CAPS symptom change score with each memory measure change score. For all analyses, in order to control for multiple comparisons, we used a more conservative significance level of $p < .01$.”

The study found that from the previous study participated in PTSD participants demonstrated a decline in delayed visual recall and delayed facial recognition. The study also found that the PTSD participants did not experience an improvement in symptoms over time and also that age did not have an effect on memory decline, heavily suggesting that the memory decline of the PTSD participants is due to PTSD.

The study was careful to isolate the effects of PTSD from other causative factors. Still it may not be enough to determine definitively that PTSD victims suffer a decline in delayed visual recall and delayed facial recognition, or that those are the only memory functions that may be affected over time by PTSD. The verbal memory and vocabulary scores of the two groups were not of significant difference. It is possible that increase in time and age from the first study actually helped increase these abilities. Also, the participants who could be contacted and recruited for a second study were generally the ones of a higher education level, lending to bias of strong performance in those areas. Since the participants in this study averaged 16 years of education the findings are not likely to be generalizable to populations with less years of education. The participants in the study of Bosnian PTSD victims discussed above averaged almost 6 years less of education.

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