

# The Effect of Mental Illness on Language Regression to the Mother Tongue in Bilingual Teenagers

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*Affective disorders in children and adolescents could impair the acquisition of a second language in bilingual individuals. The acute exacerbation of a preexisting mental illness may also lead to a loss of the ability to speak the second language for a period of time and the regression to the first (native) language as the only mode of communication. The effect could be lasting since the second language seems to have a critical period of optimal acquisition and proficiency. The underlying neural mechanisms indicated that the second language was more vulnerable to the effects of mental illness than the native language.*

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The effect of psychopathology in bilingual children and adolescents on the acquisition and the development of a second language, in this case the English language, has not been well documented in the psychiatric literature although it was reported in adult psychiatric patients.<sup>1</sup> Adolescents whose primary language was not English resorted to their mother tongue language—Spanish, Mandarin, and others—when admitted to the inpatient adolescent unit during an acute psychiatric condition and were unable to use English. These adolescents were previously able to speak English, which they had acquired with varying degrees of proficiency. Interestingly, the ability to speak English seemed to be recovered almost completely as the acute psychiatric condition subsided. In this report, we present two cases to highlight this phenomenon. The literature on bilingualism and language acquisition, especially the second language, was reviewed to explore the

different concepts and theories that might explain the characteristics and the sensitivity of the second language to mental illness.

We discuss in detail the current research of the neural mechanisms underlying bilingualism to elucidate the possible vulnerability of the secondary language to the effects of the acute psychiatric condition.

## Case 1

S.N. is a 16-year-old Chinese-American boy with a 3-year history of bipolar disorder and two prior psychiatric admissions. All previous admissions were precipitated by manic episodes associated with psychotic symptoms. The patient was admitted to the hospital against his will, in a very agitated and disorganized state. He had been decompensating for several weeks. His sleep pattern was poor, he was noncompliant with his medications, and his behavior became erratic and violent. On examination, he exhibited pressured speech, flight of ideas, expansive mood, irritability, hostility, auditory hallucinations, and religious preoccupations. There was no history of substance abuse and the family denied a family history of mental illness.

S.N. was an only child. His parents were successful restaurant owners who moved to the United States 5 years ago. S.N. was a junior high school student and his academic performance was average. The parents were involved and supportive. They spoke limited English, but at home they spoke mostly Mandarin. During the admission intake S.N. was agitated, pacing, speaking in his native language, and angrily cursing at his parents. Sporadically, he used the English words “yes” and “no.” The patient was accompanied by his caseworker, who also functioned as an interpreter, during the admission and the hospitalization. The caseworker reported that S.N. usually spoke English well except when he was

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psychiatrically ill. The patient was admitted to the adolescent psychiatric unit. In addition to the initial psychiatric evaluation, S.N. received a medical and neurological assessment by a pediatrician, a nursing assessment, an educational assessment by a special education teacher to ascertain English proficiency in reading and writing, a family assessment, and group therapy assessment by the program director (a psychologist) to evaluate the general communicative ability and assign the appropriate group therapy level suitable for patient. Assessments were attempted first in English; however, it was determined that patient was unable to use English even during spontaneous responses. This was confirmed by his case worker, who had been assigned to the case for the last 3 years to coordinate psychiatric services. The antipsychotic medication risperidone was titrated up to 2 mg at bed time and the mood stabilizer valproic acid was initiated and titrated up to 500 mg in the morning and 750 mg at bed time, with a therapeutic level of 92 µg/ml.

In the first week of the hospitalization, S.N. used Mandarin while talking to himself, communicating with the psychiatrist, or yelling at the staff. He was oblivious to the fact that no one could speak his language; the interpreter was needed for most of the time to facilitate treatment and communicate with the patient. A week later, more English words and sentences began to emerge, especially during the infrequent lucid moments, such as "food," "go home," and "you are the devil." However, he resorted to Mandarin for long conversations. In the third week, his symptoms were subsiding, the lucid periods were increasing, and S.N. began to use English more often. By the fourth week, he had improved significantly and seemed to regain his ability to speak English appropriately, using Mandarin only when talking to his parents. For the fifth and last week of the hospitalization, there was no need to use the interpreter for the daily interactions with the patient, only for the family meetings. He then was able to participate in most therapeutic modalities, including schooling on the unit. The educational assessment using the Wide-Range Achievement Test indicated that the patient was reading English at a 9th-grade level and his math was at a 10th-grade level. This proficiency was similar to school reports provided by the family and case worker.

## Case 2

V.H. is a 15-year-old girl originally from Puerto Rico, who moved to the United States 3 years ago with her

parents and her 8-year-old sister. V.H. had a 4-year-history of severe recurrent major depression without psychotic features and three prior psychiatric admissions. The first admission was in Puerto Rico at age 11.

The patient was admitted to the adolescent psychiatric unit because of a 4-week history of progressive symptoms of depression: sad mood, frequent crying episodes, hypersomnia, decreased appetite, anhedonia, social isolation, decreased energy, and suicidal ideation. The main stressors were the recent death of her grandmother, failing grades in school, the possibility she might repeat eighth grade, and the family's inability to afford her medication. There was a strong family history of depression on the mother's side.

The admission assessment was done in Spanish with the help of an interpreter because the patient and the family did not speak English. The mental status examination revealed significant depression with psychomotor retardation. The required assessments (medical/neurological, nursing, family, group therapy, and educational) had concluded that the patient was unable to use English. The antidepressant medication fluoxetine was initiated and titrated up to a therapeutic dose of 20 mg at bed time. In the first 3 weeks of the hospitalization, the patient spoke Spanish exclusively, which required the presence of the interpreter for most of the therapeutic activities such as talking to the doctors and participating in group therapy and family meetings. The mother spoke very limited English, the father spoke slightly better English than his wife because he had lived in the United States for a few years in the past, and the younger sister spoke English better than her parents. The family reported that V.H. had struggled with school work and with learning the English language, but she was eventually able to speak well enough to communicate in school. The family added that when she became very depressed, she only spoke Spanish.

The patient made significant improvements in the last week of the hospitalization. The depressive episode subsided, sleep and appetite improved, energy level increased, and the suicidal thoughts ended. Interestingly, she began to use English more each day and was able to communicate with the staff and the doctors well without an interpreter. She began to participate in most therapeutic modalities, and her educational assessment indicated that she was reading English on a 5th-grade level and was proficient at math on a 7th-grade level. These levels were close to the school records prior to admission.

## DISCUSSION

The effect of mental illness on the cognitive processes and the communicative abilities of the first language has been observed clinically and documented in the DSM-IV and other literature.<sup>2</sup> In a manic phase of bipolar disorder, patients exhibit pressured speech and flight of ideas, whereas severely depressed patients may exhibit slow speech and poverty of content of speech. In psychotic disorders, patients may manifest incoherent speech and thought blocking. Psychedelic substances also can affect language processes,<sup>3</sup> under which the subject may revert to primitive thinking, and ability to conceptualize may decrease. In schizophrenia, adult bilingual patients, reportedly, regressed to the mother tongue during acute psychotic exacerbation.<sup>1</sup> However, the effect of mental illness (affective disorders) on the second (non-native language) in bilingual adolescents has not been well documented in the literature. The two case reports revealed that patients had experienced temporary loss of English (their second language) during an acute psychiatric episode. There were different characteristics between the two patients in regard to prior level of function, English proficiency, and language structure (Mandarin versus Spanish).

S.N. came to the United States at age 11, he was an above-average student in his native country, and he did not speak English. Because the onset of his bipolar disorder was at age 13, he had had 2 years to learn English without the interruption of psychiatric episodes. By age 16 and after three psychiatric hospitalizations he managed to acquire a reasonable level of English proficiency (9th-grade level) which was reflected on the achievement tests. V.H. came to the United States at age 12, she was a below-average student who did not speak English, and she had already been diagnosed with major depression at age 11. The psychiatric episodes seemed to interrupt the acquisition of the English language from the beginning. She was only able to acquire a low level of English proficiency (5th-grade level). Mandarin differs from Indo-European languages (English and Spanish) in both its written and spoken forms. Being a tonal language, tones convey lexically meaningful information.<sup>4</sup> Across-linguistic positron emission tomography (PET) study of tone perception in Mandarin and English speakers showed that Mandarin speakers showed additional activation in frontal, parietal, and parieto-occipital regions of the left hemisphere, indicating that lan-

guage experience may influence brain circuitry in the processing of auditory cues.<sup>5</sup>

The process of language acquisition has remained a fascinating and controversial topic among linguists, psychologists, and philosophers. Chomsky<sup>6</sup> hypothesized that humans have a cognitive specialization for learning language. He proposed the term "language acquisition device" to refer to the child's strategy for constructing grammar. Lenneberg<sup>7</sup> suggested a biological "critical period" of brain development as a time window in which the language acquisition device is available to a child.

Elissa Newport<sup>8</sup> refined the thesis of a critical period, showing that fluency in second language acquisition correlated inversely with the age at which one started to learn. On average, children who start at age six get better than children who start at 12, and still better than children who start at age 18; after 18 years old the curve flattens out to adult levels of incompetence.

Several studies using psycholinguistic techniques<sup>9-11</sup> have suggested that the mental processes involved in processing the second language are qualitatively different from those used in first language processing and subserved by different brain regions. According to these studies, grammatical processing in the first language is assumed to depend on "implicit" knowledge stored in procedural memory; as a result parsing is fast, unconscious, and automatic. On the other hand the procedural memory system is less available for processing the second language and instead is assumed to rely mainly on declarative memory sources for storing knowledge about the second language, largely as "explicit" (conscious) knowledge which renders processing less automatic. Bilingual research<sup>12</sup> has also shown that among young bilingual individuals the use, domain, and preference of the first language is different from that of the second language. The first language seemed to mediate personal, intimate, and emotional mental activities, such as thinking, dreaming, praying, and talking to siblings. However, that may change once the second language becomes the dominant language.

Recent studies using functional MRI (fMRI) have shown differences between the first language and the second language in their cortical representations, pattern of brain activations, and functional organizations.

While the first language is known to be mediated mostly through the two main localized cortical regions, Broca's area of the frontal lobe and Wernicke's area of the temporal lobe,<sup>13</sup> the second language seems to be

mediated through a wider network of cortical regions that are not localized. For example, cerebral activation of the second language has shown a tendency toward a more extensive recruitment of the areas activated in the primary language and the activation of a greater number of other cortical regions, such as bilateral inferior frontal region and left middle temporal gyrus.<sup>14</sup> Other studies indicate that the two languages are functionally separated and that the second language is underrepresented in several perisylvian language zones.<sup>15</sup> In a study of the neural mechanisms underlying semantic and orthographic processing in Chinese (first) and English (second) bilinguals, the differences support the hypothesis that second language usage causes more right hemisphere activation than native language usage.<sup>16</sup> Another recent study of the structural plasticity in the bilingual brain showed that learning a second language increases the density of gray matter in the left inferior parietal cortex and that the degree of structural reorganization in this region is modulated by the proficiency attained and the age at acquisition.<sup>17</sup>

The process of learning and maintaining a second language and switching between languages involves increased general executive processing,<sup>18</sup> which requires attention, concentration, and sustained mental effort.

## CONCLUSION

The second language, depending on the duration and level of acquisition, seems to be more vulnerable to the effect of mental illness than the first language in teenagers, and since the second language seems to have a critical period during teenage years for optimal acquisition and fluency, the effect could be lasting through adulthood. Because of the wider and newly developed cortical representation, the second language requires more sustained mental effort and concentration, which are usually compromised in severe psychiatric conditions. The vulnerability of the second language might explain the tendency to return to the first language and the temporary loss of the ability to speak the second language during the severe mental distress caused by the acute psychiatric disorders. Early detection and prompt treatment of mental illness in bilingual children and adolescents may enhance the acquisition of the second language (English), and optimize their academic and learning achievements.

Further studies are needed to assess the long term effect of acute and chronic mental disorders on the acquisition of the English language and the learning abilities of many bilingual children and adolescents whose first language is not English.

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