

# Bilingualism

The Role of Language in Therapy With the Spanish-English Bilingual Client – Azara L. Santiago-Rivera and Jeanette Altarriba

Bilingualism as a contributor to cognitive reserve: Evidence from brain atrophy in Alzheimer`s disease – Tom A. Schweizer, Jenna Ware, Corinne E. Fischer, Fergus I.M. Craik, Ellen Bialystok

# Outline

- ▣ bilingualism in therapy
  - ▣ bilingualism as the norm
  - ▣ language storage
  - ▣ perspectives of therapy with bilinguals
  - ▣ assessment
  - ▣ future directions
- ▣ bilingualism and Alzheimer`s disease
  - ▣ cognitive reserve
  - ▣ experiment
  - ▣ results and open questions

# Bilingualism in Therapy

# Introduction

- ▣ culturally appropriate treatment
- ▣ language is the primary means of transmitting information about beliefs and cultural traditions
- ▣ main research in Spanish-English communities
- ▣ two broad areas of research
  - ▣ clinical evaluation of psychopathology
  - ▣ dynamics of language use in the treatment

# Bilingualism as the Norm

- ▣ single domain bilinguals – bilingual speaker
- ▣ compound bilingual
  - ▣ only one representational meaning system
  - ▣ languages are learned simultaneously
- ▣ coordinate bilingual
  - ▣ two independent language systems
  - ▣ one language first, second language at some other point in time
  - ▣ degree of interdependence

# Bilingualism as the Norm – cont.

- ▣ how to assess language ability
- ▣ standardized tests
  - ▣ culturally biased
  - ▣ fail to capture implicate knowledge
- ▣ language history questionnaire
  - ▣ ability to speak, read, write
  - ▣ percentage of daily use
- ▣ alternatively assess actual performance on a task

# How Languages Are Stored

- ▣ hard to say – MRI, PET scan
- ▣ model of language acquisition and storage (Kroll, Stewart)
  - ▣ word store – large for L1, smaller for L2
  - ▣ conceptual store – semantic information
  - ▣ words from L2 store are connected to words from L1 store
  - ▣ asymmetrical connections
  - ▣ subsequently connections from L2 store directly to conceptual one

# Conceptual Development

- ▣ experiment by Altarriba and Mathis
- ▣ Stroop color-word task
  - ▣ congruent vs. incongruent trial
  - ▣ responses in English
- ▣ longer naming latencies after single learning session



# Limitations of Model

- ▣ words with unique conceptual meaning
- ▣ concrete words vs. abstract words (emotion words)
- ▣ de Groot`s model
  - ▣ words with large overlap are interchangeable
  - ▣ language specific words
- ▣ language specific element relevant in therapy

# Storage of Emotion Words

- ▣ discussing embarrassing topics
- ▣ Bond and Lai study
  - ▣ Chinese women interviewed in Cantonese and English
  - ▣ two neutral and two embarrassing topics
- ▣ emotion words in the first language have been experienced in many more contexts
- ▣ deliberate and predictable language switching
- ▣ importance of the ability to select the language in therapy

# Perspectives in Therapy with Bilinguals

- ▣ Edith Bauxbaum – 1949
  - ▣ therapy with four German-English bilinguals
  - ▣ one woman chose to not speak English to control feelings
  - ▣ powerful memories were stored in German
- ▣ Ralph Greenson – 1950
  - ▣ role of both languages
  - ▣ Austrian German-English bilingual woman
  - ▣ sleep disturbance caused by conflicts associated with her mother
  - ▣ “In German I am a scared, dirty child; in English I am a nervous, refined woman.”
  - ▣ some sessions only in German

# Perspectives – cont.

- ▣ Eduardo Krapf – 1955
  - ▣ for the first time described language switching to reduce anxiety
  - ▣ it should be used as “a positive rather than a negative defense”
  - ▣ did not elaborate on a strategic switching

# Contemporary Views

- ▣ language independence – Luis Marcos, Rafael Javier
  - ▣ ability to acquire and maintain two separate language codes
  - ▣ separate cognitive and emotional components
  - ▣ memories are stored in language in which they occurred
  - ▣ it can lead to detachment
- ▣ Aragno and Schlachet – 1996
  - ▣ memories are tied with language and stage of development
  - ▣ word in the first language learned in a childhood triggered vivid memories, but it had no significant impact in the second language

# Language Switching in Therapy

- ▣ until 1970s no attempt to investigate the potential
- ▣ Pitta, Marcos, Alpert – 1978
  - ▣ Spanish-dominant female, English-dominant therapist
  - ▣ first sessions in Spanish to establish a relationship
  - ▣ later switch to English to distance herself from emotions
  - ▣ also used as defense mechanism

# Assessment

- ▣ assessment should include both languages
- ▣ Del Castillo – 1970
  - ▣ clients showed greater pathology in the first language (Spanish) than in the second language (English)
- ▣ Marcos, Alpert, Urcuyo, Kesselman – 1973
  - ▣ opposite results
- ▣ conclusion – bilingualism affects the assessment

# Assessment – cont.

- ▣ psychologist must distinguish between actual symptomatology and things which are associated with language use
- ▣ Gutfreund – 1990
  - ▣ Spanish-English coordinate bilinguals showed greater affect in the Spanish
  - ▣ English-Spanish bilinguals also showed greater affect in the Spanish
  - ▣ crucial is the language in which the experience is encoded



# Future Directions

- ▣ take the advantage of bilingualism
  - ▣ maintenance of the second language has positive effects on well-being, understanding complex constructions, social sensitivity
- ▣ develop appropriate measure to assess language proficiency
  - ▣ modified language history questionnaire (Altarriba, 1992)
  - ▣ psycholinguistic History – incorporates developmental, psychosocial and cultural dimensions including the language of dreams, fantasies, internal dialogs... (Perez-Foster, 1998)
- ▣ conduct experimentally controlled studies to measure the effects of language switching on the therapy process and outcomes

# Future Directions – cont.

- ▣ study of nonverbal behaviors
  - ▣ gestures, posturing and mannerisms can be language specific
  - ▣ how different would nonverbal behaviors be if the experience is told in other language
- ▣ solve the lack of psychologists adequately trained to work with bilingual clients

# Bilingualism and Alzheimer`s Disease

# Onset of Alzheimer`s Disease

- 30% of individuals shows pathological criteria for AD at autopsy, but no signs of cognitive impairment during life
- what delays the onset of symptoms of AD
- brain reserve
  - features of the brain itself
  - greater brain size, increased number of neurons, larger pyramidal neurons
- cognitive reserve

# Cognitive Reserve

- ▣ abstract term
- ▣ emphasizes functional rather than structural benefits
- ▣ intellectual, social and physical activities
- ▣ studies about delaying AD due to education, occupation, leisure activities
- ▣ what is the relation between brain and cognitive reserve

# Bilingualism and Mental Functioning

- ▣ higher level of attentional control
- ▣ Bialystok et al. – 2007
  - ▣ delay of over 4 years in the onset of symptoms in the bilinguals
- ▣ findings were replicated in other studies
- ▣ how to investigate the relation between brain pathology and CR
  - ▣ match two groups with different levels of CR on degree of brain pathology
  - ▣ match two groups with different levels of CR on cognitive level

# Design of Experiment

- ▣ 40 patients with a diagnosis of probable AD
- ▣ 20 monolinguals, 20 bilinguals
- ▣ matched on the BNA test of cognitive function
- ▣ similar number of years of education, gender mix, age
- ▣ hypothesis
  - ▣ bilingual group would show greater evidence of brain atrophy in the MTLs with little or no difference in measures of frontal or central atrophy

# Characteristics of Patients

**Table 1 – Demographic and behavioral characteristics of monolingual and bilingual patients.**

	Monolingual ( <i>n</i> = 20)		Bilingual ( <i>n</i> = 20)		<i>p</i> -value
	Mean	SD	Mean	SD	
Age at CT scan	77.2	7	78.9	7.6	.45
Age at diagnosis	77.3 <sup>a</sup>	6.8	78.9	7.7	.5
Education (years)	13.6	3.5	11.6	4.5	.12
Occupational status	3.2 <sup>b</sup>	1.2	2.1 <sup>b</sup>	1.2	.007
CDR	1.2	.4	1.2	.4	1.0
Katz ADL index (/6)	5.6	.8	5.6	.8	.91
Overall BNA (/114)	66.4	13.7	64.4 <sup>a</sup>	17.7	.7
MMSE (/30)	23.2 <sup>a</sup>	3	22.1 <sup>c</sup>	5.1	.43
Clock Drawing Test (/15)	10	4.2	10.3	4.8	.83

a *n* = 19.

b *n* = 18.

c *n* = 17.



# Results

**Table 2 – Brain ratios and scores of monolingual and bilingual patients.**

	Monolingual (n = 20)		Bilingual (n = 20)	
	Mean	SD	Mean	SD
Bicaudate ratio	.17	.03	.18	.05
Huckman's number	60.01	7.82	64.30	12.18
Evans ratio	.36	.05	.35	.07
Suprasellar cistern ratio	.20	.02	.20	.02
Temporal horn ratio	.03***	.01	.05***	.02
Third ventricle ratio	.06**	.02	.07**	.01
Radial width of the temporal horn (rWTH) <sup>a</sup>				
Left	4.16***	1.09	7.23***	3.21
Right	4.04*	1.56	6.48*	3.64
Largest	4.69***	1.31	7.87***	3.53

\* $p < .05$ .

\*\* $p < .01$ .

\*\*\* $p \leq .001$ .

<sup>a</sup>  $n = 19$ /group.

# Discussion

- study showed that bilinguals exhibited greater amounts of brain atrophy in regions associated with disease pathology
- differences between the groups in education and occupation work against the hypothesis
- immigration issue
  - 9 of 20 monolinguals and 16 of 20 bilinguals were immigrants
  - delay in onset of AD is not affected by immigrant status – proved by Bialystok et al. (2007) and Craik et al. (2010)

# Open Questions

- ▣ how does CR work
- ▣ does education, social, physical and intellectual activity modify some aspects of brain function
- ▣ does CR act like a highly practiced skill enabling the cognitive system to make more efficient use of impaired cerebral resources
- ▣ is there any difference between cognitive and brain reserve