Critical Review:
Does naming in the primary language of bilingual individuals with aphasia benefit from intervention targeting naming in the secondary language? *

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This critical review examines the transfer effect of naming therapy from secondary language to primary language in bilingual individuals with aphasia. A literature search yielded five papers, four of which were single-subject designs, and one systematic review. Overall, the literature reviewed indicates that naming therapy in a bilingual person with aphasia's second language results in equivocal improvements for naming in the first language. The clinical implications of these findings are discussed.

Introduction

Aphasia is an acquired neurogenic language disorder resulting from damage to portions of the brain that are responsible for speaking, reading, listening and writing (Chapey, 2008). Bilingual aphasia occurs when a bilingual individual experiences a decline in one or both languages following damage to the language dominant hemisphere (Edmonds & Kiran, 2006; Kohnert, 2009). Greater than half of the world's population speaks more than one language (Croft, Marshall, Pring & Hardwick, 2011; Edmonds & Kiran, 2006; Faroqi-Shah, Frymark, Mullen & Wang, 2010; Kiran, Sandberg, Gray, Ascenso & Kester, 2013) and therefore, an individual with aphasia may also be bilingual (Faroqi-Shah et al., 2010). Naming deficits are common among persons with aphasia. A variety of naming interventions exist for targeting these deficits (Kiran & Bassetto, 2008) but relatively little is known about the rehabilitation of naming in individuals who are bilingual and subsequently develop aphasia, or what the best course of intervention for these individuals is as compared to monolinguals with aphasia (Edmonds & Kiran, 2006; Faroqi-Shah et al., 2010; Kurland & Falcon, 2011).

Speech-language pathologists (SLPs) must provide intervention for bilingual clients with aphasia with the goal of improving quality of life and meaningful life participation (Faroqi-Shah et al., 2010) as well as providing effective therapy, completed in an efficient amount of time (Kiran & Roberts, 2010). Often it is necessary for clients who speak more than one language to improve the use of both languages in order to achieve the goal of participation and fully regain involvement in all aspects of their life (Faroqi-Shah et al., 2010; Kohnert, 2009).

In Canada, citizens across the country report over 200 different native or first (L1) languages (Language Characteristics of Canadians, 2012). The presence of bilingual clients with aphasia presents a challenge for any SLP who does not share the same L1 as the client and cannot provide therapy in that language (Croft et al., 2011). In order to reach the client's goals for overall life participation, an SLP who does not have consistent access to an interpreter may have to resort to providing therapy in the client's second language (L2). This leads this writer to wonder if providing naming intervention in L2 has any positive effect on naming in L1 or if therapy is language specific, without any generalization across languages. Effects of intervention for bilingual clients following the onset of aphasia are conflicting (Croft et al., 2011). However, it is hypothesized that both languages of a bilingual speaker share common brain pathways and overlapping brain regions (Kurland & Falcon, 2011). Therefore, it would be reasonable to hypothesize that gains in one language may transfer to the other. For providing naming therapy in the L2 of a bilingual client with aphasia to be an ethically valid and reasonable approach to therapy, there must be generalization of therapy outcomes across languages resulting in improvements in L1 (Faroqi-Shah et al., 2010).

Objectives

The primary objective of this critical review is to evaluate existing literature and determine the efficacy of providing naming therapy in L2 in order to measure generalized improvements to naming in L1 for a variety of bilingual individuals with aphasia. The secondary objective is to provide SLPs working with this population with evidence based recommendations regarding implementations of this practice.

Methods

Search Strategy
An online computer database search was conducted using PsycINFO, Scholars Portal and Google Scholar to

find articles included in this review. The search was conducted using the following terms: [((bilingual aphasia) OR (bilingual with aphasia)) AND ((naming therapy) OR (naming intervention))].

<u>Selection Criteria</u>
Articles selected for inclusion in this review examined the influence of naming therapy in L2 on naming outcomes in L1 for bilingual individuals with aphasia. Papers that did not specify the primary language of the participants or that were published prior to 2010 were excluded from this review.

<u>Data Collection</u>
Results of the search generated five articles that met the previously described criteria from the last five years. Four papers examined the effect of naming treatment in L2 on naming outcomes in the L1 using a single-subject design. One qualitative systematic review examining the effects of cross-language transfer following treatment for bilingual individuals with aphasia was also included.

Results

Kurland and Falcon (2011) conducted a single-subject design with a bilingual individual with aphasia to examine the within- and cross-language effect of semantic naming treatment in L1, L2, and both L1 and L2. The participant was a 65 year old Spanish (L1) and English (L2) speaker who was 10 months post-onset of a cardiovascular accident (CVA) in the left hemisphere. The participant underwent two and a half hours of treatment per day, 5 days a week for 2 weeks, followed by a 2 month washout period before beginning the next phase. Treatment was conducted first in Spanish, then English, and finally in both Spanish and English. Treatment consisted of intensive verbal naming, picture matching, and categorization. Results were measured using accuracy for trained and untrained pictures, as well as subtests for naming and repetition on the <u>Bilingual Aphasia Test</u> (BAT), the <u>Boston Naming Test</u> (BNT) and <u>The Boston Diagnostic Aphasia Examination</u> (BDAE) between phases. Results showed improved performance in Spanish naming outcomes regardless of which language treatment occurred in, suggesting generalization from L2 to L1. However, greater improvements were noted in Spanish following treatment in L1.

It is important to interpret results cautiously while being mindful of the study's limitations. No statistical measures were reported in the study. Rather, conclusions were drawn from the raw scores and percentile ranks of the administered standardized tests. It is impossible to determine if the improvements noted in the participant's Spanish naming ability following

treatment in English had any statistical significance. The participant was given multiple standardized tests of a similar procedure in a short period of time, creating a threat to the internal validity through testing effects. Furthermore, it is important to remember that single subject n-of-1 designs are restricted by the sample size, which limits the generalizability of the results to the overall population.

Kurland and Falcon (2011) offer equivocal evidence in support of L2 naming therapy for improving L1 naming due to the poor quality of the research design and reduced generalizability.

In 2012, **Miller Amberber** conducted a single-subject n-of-1 research design with a 59 year old French (L1) and English (L2) speaker five years post onset of a left hemisphere temporal-parietal CVA to determine the effect of treatment in L2. The participant received 48 hours of therapy over 45-minute sessions, 4 times per week for 16 weeks exclusively in English. Therapy was focused on improving access to everyday vocabulary and included multi-modal access to naming and conversation, including <u>Promoting Aphasics' Communicative Effectiveness</u> (PACE) and explicit wordfinding tasks. Naming outcomes were measured pre- and post-treatment using the BAT. Overall, the participant improved in the language of treatment, showing a significant improvement in naming ability in English. However, there was no improvement of naming in L1 (French) following therapy in L2 (English).

An appropriate Wilcoxon matched paired test was used to determine that there was no treatment effect as determined by measures taken at baseline and post treatment on the BAT. However, the participant was already at maximum proficiency for naming in L1 on the BAT pre-treatment measure. This was not an appropriate measure for determining naming improvements, as there was no way to measure these improvements had they occurred.

Considering limitations of the pre-treatment and post-treatment measurements, this study provides equivocal evidence that providing therapy in L2 does not improve naming abilities in L1.

In a single-subject multiple baselines design, **Kiran and Roberts** (2010) explored the generalization of treatment from one language to the other through targeting naming in four participants, two Spanish-English speakers and two French-English speakers. All four participants were at least six months following a single stroke in the left hemisphere and L2 English speakers. Treatment consisted of five sets, two in L1, two in L2,

and one control set. Each participant completed treatment in one set from each language, with baseline data measured using the remaining sets. Seven-step semantic feature analysis treatment continued until participants reached 80% accuracy or 20 sessions, at which point treatment then began in the opposite language. The initial language of treatment was decided prior to obtaining participants and was then balanced across participants. Participants completed relevant subtests of the <u>Western Aphasia Battery</u> (WAB), <u>Psycholinguistic Assessment of Language Processing in Aphasia</u> (PALPA), BNT and BAT prior to treatment, and post-treatment measures were taken on the WAB and PALPA. Baseline data from both languages were taken from three initial sessions to determine the number of stimuli each participant was consistently unable to name. Results from treatment probes indicated that one of the four participants showed improvement in French naming after receiving treatment in English. Of the three remaining participants, one was never treated in L2 due to a vast improvement in L2 after treatment in L1, while the final two participants showed no generalization from L2 to L1 naming ability.

Effect sizes were calculated by comparing the mean from treatment and maintenance measures to the baseline mean and dividing it by the standard deviation of the baseline. This measure appropriately allows outcomes between and within individuals to be compared (Beeson & Robey, 2006). Strengths of the study include controlling for type of stroke, onset of stroke, health status and sex. The study clearly defined treatment methods to allow for replication of the procedures and included more than one type of bilingual for better generalization to different bilinguals who speak different languages. Reliability was monitored by recording sessions and scoring completed by two individuals who had greater than 90% agreement. The most important caveat to the effects of intervention in L2 on improvement in L1 was the lack of replication of across participants.

This study took measures to control their patient population and provided a detailed explanation of methods and results, as well as participant differences. It provides subjective evidence in support of using naming therapy in L2 to improve naming in L1.

Croft et al. (2011) investigated the effect of naming treatment for five Bengali-English bilingual individuals with aphasia and whether generalization would occur from L2 to L1 in this repeated measures, double baseline single-subject design. All participants were at least seven months post-onset of CVA. Twenty healthy controls, bilingual in Bengali (L1) and English (L2), were tested on naming of 150 pictured nouns in Bengali

and English in order to develop baseline tests for the bilingual individuals with aphasia to ensure items were of comparable difficulty across languages. Controls scored at ceiling on the naming tests with no differences between Bengali and English scores, while the participants with aphasia demonstrated a wide range of abilities. Each participant selected a vocabulary of 150 words which was assessed five times throughout the study. Therapy consisted of ten one-hour sessions twice a week. Vocabulary was divided into five groups of 30 items (two in Bengali, two in English, and one untreated control set) for treatment. The language for phase one of treatment was selected by the participant, and phase two was completed in the opposite language. Two baseline measures were taken before treatment, one after phase one of treatment, one following phase two, and again 4 weeks post treatment. Improvement was measured in L1 following treatment in L2 in one participant, but this participant failed to maintain the statistically significant improvement four weeks after treatment.

An appropriate McNemar Chi-square test with one degrees of freedom was used to determine the effects of naming therapy and cross-linguistic generalization with a p-value of <0.05. The methods for administration of therapy were clearly explained for ease of replication. The authors chose to conduct a case series rather than a group design due to the variability in language ability of the participants, however baseline data was taken for all participants. The authors failed to control for this confounding factor, as language proficiency may have had an effect on the results after treatment. The authors also failed to control for type of CVA, which could have an impact on the participants' response to therapy and overall naming ability.

Considering the strengths of this study, including appropriate statistical measures and controlling for appropriate treatment stimuli across languages, it provides compelling evidence against using naming therapy in L2 to improve naming in L1 because no participants maintained treatment gains.

Faroqi-Shah et al. (2010) published a systemic review that evaluated the research available from 1989 to 2009 addressing the question of whether there is an effect of treatment provided by an SLP in L2 on expressive language skills in L1 for bilingual clients with aphasia. Thirteen articles were chosen for inclusion in the review following the elimination of 161 citations. These citations were excluded due to a lack of intervention provided, a lack of original data, not being published in a peer-reviewed journal, not including the correct age or population, or an inability to obtain full-text articles. Overall, participants included 45 bilingual individuals with aphasia ranging from 21-80 years. Of the 13

articles reviewed, 11 studies examined L2 treatment and its' effect on L1 language outcomes. Five of these 11 studies found cross language transfer, indicating improvements in L1 following treatment in L2. Of these five studies, three focused on naming therapy and naming outcomes and reported an improvement in L1 naming following naming treatment in L2. The remaining two articles did not use naming as an outcome measure following treatment in L2. The authors concluded that there is some evidence for cross-linguistic transfer in naming treatment for bilingual individuals with aphasia in the second language.

The systematic review by Faroqi-Shah et al. (2010) identified all the appropriate studies and eliminated inappropriate studies to address the research question with a thorough search of appropriate databases. The present systematic review reports on the quality markers of each citation that was included. The study reports limitations, including the quality of the research that was reviewed as it lacked random sampling, blinding and evaluation of fidelity. The greatest limitation for the research question remains the limited number of articles that specifically included naming therapy and explicitly measured naming outcomes in L1 after treatment in L2.

Considering the results obtained in this review, it provides equivocal evidence for providing naming therapy in L2 in order to obtain improvements in naming ability in L1.

Discussion

The primary objective of this paper was to review the current literature on the effect of naming therapy in L2 on naming outcomes in L1 for bilingual individuals with aphasia. Overall, there is limited transfer of naming improvements from L2 to L1 in this population. Of the five articles, Kiran and Roberts (2010) conducted a study with the highest level of evidence and clear well-designed treatment implementation. They reported suggestive support for naming therapy in L2 showing improvement in L1 naming outcomes in one out of four bilingual participants with aphasia. Faroqi-Shah et al. (2010) also provided equivocal evidence suggesting that there is a possibility for the improvement in L1 naming following L2 naming therapy. The remaining articles (Croft et al., 2011; Kurland & Falcon, 2011; Miller Amberber, 2012) do not support the use of naming therapy in L2 to improve naming in L1. However, these articles were of lower level clinical evidence (Croft et al., 2011) and of poorer research method and reporting quality (Kurland & Falcon, 2011).

Some evidence supports that there may be benefits to providing naming therapy in L2 for gaining improvements in naming in L1. It is important to note that the design of the present studies are limited by small sample sizes. Two of the five studies were conducted using a single-subject design with only one participant, while the other studies contained a maximum of five participants. These results should be cautiously generalized to a greater population.

A number of important considerations should be addressed before inferring the quality of the evidence and the efficacy for providing naming therapy in L2 with the goal of improving naming in L1 for bilingual individuals with aphasia.

First, the studies included in this appraisal differed in protocol for administration of naming intervention. Naming therapy for aphasia encompasses many different techniques and protocols. The studies reviewed in this appraisal differed in the administration, scoring and intensity of therapy. Differences in administration may have affected results and this limits the ability to make comparisons between studies.

Second, many of the studies reported on, but failed to control for differences in the proficiency of bilingualism between participants as well as differences in type and severity of aphasia, except for Kiran and Roberts (2010). This included differences in age of acquisition of L2, as well as proficiency of L2 and language dominance. Many studies relied on self-report to determine the level of proficiency with both languages of the bilingual language users. There is no reports on the validity of self-report of language proficiency as compared to standardized measures of proficiency, as self-reports only reflect the participant's subjective judgments. (Kiran & Roberts, 2010), and therefore reports from the participants may be inaccurate. Proficiency in language may have an effect on the connection shared between both languages of a bilingual speaker and lead to differences in cross-language transfer (Kurland & Falcon, 2011).

Future research considerations:
It is recommended that further research be conducted to replicate the effectiveness of providing naming treatment in L2 for generalization of effects to naming abilities in L1. To strengthen the evidence, future research designs may consider the following recommendations:

    1.1 Including a larger population size with consistent inclusion criteria to increase the confidence for implementing treatment in a clinical setting.

    1.2 Implementing a consistent treatment protocol to systematically explore which components of naming therapy are

imperative to the effectiveness for bilingual individuals with aphasia for more reliable comparison between studies.

1.3 Using standardized measures to determine proficiency in language rather than self-report.

Conclusion & Clinical Implications

Based on the findings of these studies, the evidence is equivocal and requires further research before implementing the use of naming therapy in L2 for the goal of improving naming in L1 into clinical practice. Clinical application of this type of intervention should be used with extreme caution considering the individual differences in the population and proficiency levels in both languages.

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