



## The Manifestation of Pronoun Use in Turkish Non-Fluent Aphasia

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# The manifestation of pronoun use in Turkish non-fluent aphasia

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## Introduction

Pronouns have been shown to be impacted in speech production of persons with aphasia (PWA). Earlier spontaneous speech studies reflect a general trend across different languages by reporting omissions of pronominal elements (Fabbro, & Frau, 2001; Rossi & Bastiaanse, 2005). Some other studies showed that PWA overuse pronouns in languages with rich inflection paradigms, such as Swedish and Icelandic (Ahlsén, & Dravins, 1990, Magnúsdóttir, & Thráinsson, 1990). Difficulty with pronouns seems to be largely heterogeneous (Ishkhanyan et al., 2017; Martínez-Ferreiro et al., 2019; for reviews: Arslan et al., 2021; Menn et al., 1990). Turkish is a richly inflected language with a large case-marking paradigm, and it allows object and subject dropping. We know so little about the manifestation of pronoun use in Turkish aphasia. This study investigates the appraisal of pronoun variables in Turkish PWA's spontaneous speech production.

## Methods

Narratives from 10 PWA (4 females, aged 43-74) and 10 non-brain-damaged controls (2 females, aged 37-67) reported in Arslan et al. (2016) were used in the current study. The participants were asked to produce narratives based on a personal interview and picture description. For each participant, a 200-word speech sample was extracted and analyzed. The following pronoun variables were evaluated: personal, reflexive, demonstrative, indefinite, possessive, and interrogative as well as the number of pronoun droppings. Pronouns were tallied with regard to the case-marking used (nominative, accusative, dative, locative, ablative) in subsequent analysis.

## Results

Table 1 presents the results from group comparisons for each pronoun variable examined. We found that Turkish-speaking PWA have an elevated number of pronouns, pronoun-to-noun, and pronoun-to-word ratio, but not total number of nouns. Production of the object and subject personal pronouns was found to be within the control norms. The PWA produced an increased number of pronoun dropping in both object and subject positions in comparison to the controls. The PWA produced a larger number of demonstrative and indefinite pronouns. Reflexive and interrogative pronouns were used very infrequently in both groups, however, PWA produced the former less than the controls. Further analysis showed that the PWA produced all case-marked pronouns within the control norms.

## Conclusions

The results show that non-fluent aphasia in Turkish is manifested with overuse of pronouns, evidenced by an increased pronoun/noun ratio. A critical examination into these overuses shows that the PWA overused the so-called empty variables (i.e., demonstrative and indefinite pronouns). These suggest that Turkish PWA overuse pronouns as a strategy to avoid the retrieval of nouns with complex morphology as also evidenced in many languages with complex inflectional paradigms (see Menn et al., 1990). The overuse of pronouns in PWA speaking languages which allow pronoun-dropping is not uncommon (see e.g., Martínez-Ferreiro et al., 2019). Although Turkish allows for dropping of pronouns, the PWA's uses of both object and subject dropping instances were above the control norms. This finding is consistent with general characteristics of non-fluent aphasia in Turkish with reduced complexity and length in utterances produced (Arslan et al., 2016).

## References

- Ahlsén, E., & Dravins, C. (1990). Agrammatism in Swedish: Two case studies. *Agrammatic aphasia*, 545-622.
- Arslan, S., Devers, C., & Ferreiro, S. M. (2021). Pronoun processing in post-stroke aphasia: A meta-analytic review of individual data. *Journal of Neurolinguistics*, 59, 101005.
- Arslan, S., Bamyacı, E., & Bastiaanse, R. (2016). A characterization of verb use in Turkish agrammatic narrative speech. *Clinical linguistics & phonetics*, 30(6), 449-469.
- Fabbro, F., & Frau, G. (2001). Manifestations of aphasia in Friulian. *Journal of Neurolinguistics*, 14(2-4), 255-279.
- Ishkhanyan, B., Sahraoui, H., Harder, P., Mogensen, J., & Boye, K. (2017). Grammatical and lexical pronoun dissociation in French speakers with agrammatic aphasia: a usage-based account and REF-based hypothesis. *Journal of Neurolinguistics*, 44, 1-16.
- Magnúsdóttir, S., & Thráinsson, H. (1990). Agrammatism in Icelandic: two case studies. *Agrammatic Aphasia. A Cross-Language Narrative Sourcebook*. John Benjamins, Amsterdam, 443-543.
- Martínez-Ferreiro, S., Ishkhanyan, B., Rosell-Clarí, V., & Boye, K. (2019). Prepositions and pronouns in connected discourse of individuals with aphasia. *Clinical linguistics & phonetics*, 33(6), 497-517.
- Menn, L., Obler, L. K., & Miceli, G. (Eds.). (1990). *Agrammatic aphasia: A cross-language narrative sourcebook (Vol. 2)*. John Benjamins Publishing.
- Rossi, E., & Bastiaanse, R. (2005). Clitic production in Italian agrammatism. *Brain and Language*, 95(1), 159-160.

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**Table 1.** Mean and standard deviations of pronoun variables produced by the PWA and controls, and outputs from statistical analysis (significant differences are bolded, for normally distributed samples Welch t-tests and for non-normally distributed samples Wilcoxon rank sum tests were utilized).

	Aphasia Mean (sd)	Control Mean (sd)	Statistical outputs	95% CIs
<b>Total number of Pronouns</b>	<b>36.7 (10.18)</b>	<b>28.0 (5.66)</b>	<b><math>t = 2.36, p = .033</math></b>	<b>[0.81, 16.59]</b>
Total number of Nouns	71.5 (18.19)	79.1 (11,76)	$t = -1.11, p = .284$	[-22.17, 6.97]
<b>Pronoun-to-noun ratio</b>	<b>0.55 (0.23)</b>	<b>0.37 (0.11)</b>	<b><math>t = 2.30, p = .038</math></b>	<b>[0.01, 0.36]</b>
<b>Pronoun-to-word ratio</b>	<b>0.18 (0.05)</b>	<b>0.14 (0.03)</b>	<b><math>t = 2.36, p = .033</math></b>	<b>[0.00, 0.08]</b>
Total number of Personal Pronouns	8 (2.94)	9.3 (4.22)	$t = -0.80, p = .436$	[-4.75, 2.15]
Total number of Subject Personal Pronouns	4.6 (2.67)	4.1 (2.81)	$t = 0.41, p = .688$	[-2.08, 3.08]
Total number of Object Personal Pronouns	2.7 (1.70)	3 (2.31)	$t = -0.33, p = .745$	[-2.22, 1.62]
<b>Total number of pronoun dropping</b>	<b>44 (10.02)</b>	<b>32.1 (8.13)</b>	<b><math>t = 2.92, p = .009</math></b>	<b>[3.30, 20.50]</b>
<b>Total number of subject pronoun</b>	<b>29.4 (6.82)</b>	<b>21.3 (5.87)</b>	<b><math>t = 2.85, p = .011</math></b>	<b>[2.11, 14.09]</b>

<b>dropping</b>				
<b>Total number of object pronoun dropping</b>	<b>7.6 (5.08)</b>	<b>1.8 (1.32)</b>	<b><math>t = 3.49, p = .006</math></b>	<b>[2.11, 9.49]</b>
<b>Total number of Demonstrative Pronouns</b>	<b>11.1 (7.68)</b>	<b>3.5 (2.46)</b>	<b><math>t = 2.98, p = .013</math></b>	<b>[1.98, 13.22]</b>
<b>Total number of Indefinite Pronouns</b>	<b>10.2 (5.20)</b>	<b>5.6 (3.57)</b>	<b><math>t = 2.31, p = .035</math></b>	<b>[0.37, 8.83]</b>
Total number of Possessive Pronouns	7.2 (3.85)	10 (3.27)	$t = -1.75, p = .097$	[-6.16, 0.56]
<b>Total number of Reflexive Pronouns</b>	<b>0.1 (0.32)</b>	<b>0.8 (0.92)</b>	<b><math>W = 24.5, p = .024</math></b>	<b>[-1.00, -4.37]</b>
Total number of Interrogative Pronouns	0.4 (0.97)	0.6 (1.58)	$W = 49.5, p = 1$	[-2.05, 2.61]
Total number of Pronouns in Nominative Case	16.6 (7.17)	11.60 (4.60)	$W = 69.5, p = .148$	[-1.00, 11.00]
Total number of Pronouns in Accusative Case	1.8 (1.62)	2.90 (2.23)	$W = 35.5, p = .280$	[-3.00, 1.00]
Total number of Pronouns in Dative Case	2.7 (3.37)	1.00 (1.05)	$W = 67, p = .196$	[-5.99, 2.00]
Total number of Pronouns in Locative Case	5 (4.59)	1.90 (1.20)	$W = 71, p = .118$	[-1.00, 5.00]
Total number of Pronouns in Ablative Case	3.4 (2.01)	1.90 (2.08)	$W = 75, p = .054$	[-3.26, 3.00]