# Graphematic representation in Japanese braille and print: Implications for grapholinguistics

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Braille is a system of tactile signs formed by raised dots. It is used by blind and visually impaired individuals worldwide to read and write in numerous languages. While braille can be used for sign-by-sign transliteration of print texts (e.g., English Grade 1), the actual braille representation of a language often contains structural features absent from the print representation of the same language (e.g., English Grade 2). Hence, braille and print constitute related but distinct writing systems. Nevertheless, braille remains largely underexplored in grapholinguistics, despite growing recognition that it deserves focused research (Englebretson et al. 2023; Iyengar 2024).

This paper aims to compare the graphematic representations of Japanese braille and print to demonstrate the significance of such cross-modal comparisons for the linguistic analysis of writing systems. Drawing on the conventions of the Braille Authority of Japan (2018), it will highlight two key structural features of Japanese braille representation. First, the braille signs are segmentally encoded and moraically organised (1a), differing from the moraic *kana* signs (1b) and the morphographic *kanji* signs (1c) employed in print. Second, the braille words use blank spaces to separate lexemes as well as trimoraic or longer compound constituents (2a), unlike the unspaced representation in kana (2b) and kanji (2c).

(1) Example: /teN/

a. ⠿⠄⠄ ([を /t/ + え /e/] + ん /N/)

b. てん (て /te/ + ん /N/)

c. 点 (点 {teN} ‘point’)

(2) Example: NIHON+TENJI ‘Japanese braille’

a. ⠇⠄⠄⠀⠿⠄⠐⠾ (⠇⠄⠄ NIHON + ⠀ <BLANK> + ⠿⠄⠐⠾ TENJI)

b. にほんてんじ (にほん NIHON + てんじ TENJI)

c. 日本点字 (日本 NIHON + 点字 TENJI)

The comparison suggests that Japanese braille is a lesser-known type of phonographic writing system. The paper will elaborate on this point and explore the benefits and challenges of incorporating such analysis into grapholinguistics.

Braille Authority of Japan. (2018). *Nihon tenji hyōkihō 2018-nen ban* [日本点字表記法 2018 年版 ‘Japanese braille notation, 2018 edition’]. Hakubunkan Shinsha.

Englebretson, R., Holbrook, M. C., & Fischer-Baum, S. (2023). A position paper on researching braille in the cognitive sciences: Decentering the sighted norm. *Applied Psycholinguistics*, *44*, 400–415. https://doi.org/10.1017/S0142716423000061

Iyengar, A. (2024). *Braille as writing: Evidence and lessons for grapholinguistic theory* [Conference presentation]. Grapholinguistics in the 21st Century, 2024, Università Ca’ Foscari, Venice, Italy. https://youtu.be/LkwfCXVfB78?si=-zJl6ZDdeoIbculp