Demographic diversity and variation in spatial behaviour within language communities

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Considerable diversity in linguistic and non-linguistic spatial behaviour is well established (Levinson 2003). However, much research treats languages as individual data points, typologizing them on preferred Frame of Reference (FoR). For Majid et al (2004), for example, Mopan Mayan, is an "intrinsic language", providing intrinsic and absolute FoR, with intrinsic preferred and absolute used in restricted contexts. Conversely, Tzeltal Mayan provides the same two FoRs, but is an "absolute language", with absolute preferred and intrinsic dispreferred. Yucatec Mayan is a "relative language", despite providing all three FoRs, with intrinsic and relative equally preferred. This approach fails to address several key issues. With multiple strategies available, what governs speaker choice of one strategy over another? When and why is a dispreferred or restricted strategy used? Crucially, it does not allow for variation in strategy preference among speakers of one language. A handful of studies have found that individuals use multiple strategies (Bohnemeyer 2011), but strategy preferences vary (Palmer et al. 2017). In Yucatec, all speakers use intrinsic extensively, and absolute and relative are used, but rarely by women (Bohnemeyer 2006:307-309). In Mopan, women and men use intrinsic and egocentric strategies (Danziger 1999), but women show a two to one preference for intrinsic over egocentric, while men show the opposite. Diversity has been observed on the basis of occupation (Ancash Quechua, Shapero 2016), and age (Gurindji, Meakins & Algy 2016). In Ancash and Yucatec, occupation and gender are proxies for nature of interaction with environment. These studies point the way, but variation in strategy choice between individuals, and the extent of and basis for that variation, remains largely uninvestigated.

This paper focusses on diversity in spatial language and non-linguistic behaviour *within* languages. We present findings from a recent large-scale study of spatial behaviour in the Marshallese (Marshall Islands) and Dhivehi (Maldives) communities. Following our study of variation based on location (Palmer et al. 2017), here we model the spatial strategy preferences of individual speakers. Using a set of systematically applied experimental tasks we find that all speakers employ multiple strategies, but significant variation occurs between speakers in strategy preferences. We correlate these preference with individual demographic factors including occupation, gender, age, education, literacy, and English bilingualism, along with group-level cultural practices (e.g. dominant subsistence mode) and environment (e.g. urban density). We find that individual strategy preferences pattern with each factor. We synthesise our findings with those of previous studies showing intra-community variation, and apply Sociotopography (Palmer et al. 2017) to model the interaction of individual demography with language, environment, and cultural practice. Our model reveals spatial behaviour that is considerably more flexible and nuanced than previously recognized, in a way that enables humans to respond effectively to diverse spatial communicative demands. We conclude that variation within languages is as important as diversity between languages, but is significantly under-investigated, and that any attempt to model human spatial cognition must account for diversity within as well as between communities, and for the role of the environmental, individual, and community-level factors that correlate with that diversity.

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