Age of Acquisition Effects on Phonological and Semantic Fluency in TİD

Verbal fluency tests (VFTs) are the measures of verbal functioning. While semantic fluency tasks are believed to mostly reflect verbal ability, phonological fluency tasks are said to best uncover executive control abilities which have been associated with lexical access speed (Shao et al., 2014). In developing and adapting VFTs for sign languages, previous research focused mainly on deaf signers with neurological disorders (Marshall et al., 2013), modality differences (Marshall et al., 2014; Sehyr et al., 2018) and bimodal bilingualism (Giezen & Emmorey, 2017; Pino Escobar et al., 2018). Very few studies investigated age of acquisition in verbal fluency (Beal-Alvarez & Figueroa, 2017; Sehyr et al., 2018). In this study, we examine the age of acquisition effects on the semantic and phonological fluency of native (n=10) and non-native (n=10) adult TİD signers.

The test included 12 phonological categories, incorporating both the parameters of "handshape" and "location," and 6 semantic categories. We further divided the categories with respect to their level of complexity, as illustrated in Table 1. The phonological complexity was based on our analysis of frequency of occurrence of each handshape and location in the TİD Dictionary (Makaroğlu & Dikyuva, 2017). We based the semantic task on the category norms provided by Van Overschelde et al. (2004). The signers were asked to produce as many novel signs as possible within 60 seconds for each category. We measured the total number of correct responses. The digitally recorded responses were annotated in ELAN and then transferred to SPSS for analysis.

The overall results revealed that the native signers performed significantly better than the non-native signers on the semantic and phonological tasks including both handshape and location ($p<.01$). We then looked at whether the performances of the signers differed as the complexity of the categories changed (see Table 2). In "easy" categories, we found a significant difference between the native and the non-native signers only for semantics and location, but not for handshape. The groups did not significantly differ in any of the "medium" categories and interestingly, we observed a significant difference in "difficult" categories only for handshape and location. The native signers scored higher.

We thus propose that native signers share a similar vocabulary size with non-native signers but have better executive control ability. As the non-native signers performed comparably to the native signers in semantic medium and difficult categories, we do not expect them to differ in their lexical knowledge. However, we attribute the poorer performance of the non-native signers in difficult categories of phonology as well as in easy categories -with the exception of handshape- to poorer executive control abilities which have also been linked to lexical access speed (Shao et al., 2014). We argue that handshape was not inhibited by variation in lexical access speed because of the considerably low number of responses across both groups compared with the other domains; and thus, its easy categories may have remained unaffected by the discrepancy.

(484 words)

Tables

Table 1. Phonological and semantic categories.

Task	Parameter	Easy-1	Easy-2	Medium-1	Medium-2	Difficult-1	Difficult-2
Phonology	Handshape	 - Flat-B	 - 1	 - 2	 - T	 - L	 -8
	Location	Above-shoulders	Hands	Chest	Arms	Stomach	Shoulders
Semantics		Relatives	Fruits and Vegetables	Professions	Something made of wood	Diseases	Sciences

Table 2. Mean number of correct responses of native and non-native TİD signers on phonological and semantic tasks with respect to categorical complexity.

	Easy		Medium		Difficult	
	Native	Non-native	Native	Non-native	Native	Non-native
Handshape	10.9	7.7	8.8	6.8	6.9	4.1
	p=.023		*p=.026*		*p<.01*	
Location	13.6	9.9	9.4	7.3	7.5	5.0
	p<.01		*p=.058*		*p<.01*	
Semantics	18.5	14.6	12.2	9.6	8.4	5.9
	p<.01		*p=.025*		*p=.022*	