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Discourse production of mandarin-speaking children with high-functioning autism: The effect of mental and action verbs' semantic-pragmatic features

Yiqi Song[a], Zhongheng Jia[b], Shunhua Liu[c], Dandan Liang[a,*]

[a] Nanjing Normal University, PR China
[b] Tongji Zhejiang College, PR China
[c] Anshun University, PR China

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ABSTRACT

The present study investigated the syntactic and pragmatic performance of children with high-functioning autism (HFA) during a discourse production task with mental verbs. Children with HFA and typically developing (TD) children were matched by chronological age, verbal IQ (VIQ) and full-scale IQ (FIQ). We found that children with HFA tended to select a nominal object given a mental verb with either a nominal or clausal object. They committed few syntactic errors but generated syntactic stereotypes with mental verbs. However, this behavior was not observed with action verbs. Thus, children with HFA were specifically impaired in the argument structures of mental verbs. In pragmatic performance, children with HFA produced significantly fewer clauses or sentences with lower syntactic complexity for mental verbs than TD controls. This result might be due to the semantic-pragmatic impairment of children with HFA in the use of mental verbs. This study concludes that children with HFA were able to acquire the syntactic frames of mental verbs but were nevertheless impaired in the acquisition of pragmatic information inherent in those verbs.

1. Introduction

Mental verbs are a subset of verbs that are semantically defined and subjective by nature. They express feelings, intentions, cognition, sensations and other mental activities or states. They are atypical members of the verb category, such as *xiang1xin4* (*believe*; hereafter, Chinese words are in *pinyin,* a transcription of Chinese in the Roman alphabet) and *hai4pa4* (*fear*) in Chinese. In contrast, action verbs are of an objective nature. They denote actions, behaviors, or a series of observable activities and readily arouse concrete visually representative images, such as *ding1zhe0* (*stare*) and *da3sao3* (*sweep*). With regard to semantic features, the meanings of mental verbs may be less immediately accessible due to the subjectivity of the activities they denote. The classification of action verbs in Chinese is definite and generally accepted, but this is not true of mental verbs (Wang, 2004). For instance, Li and Zheng (1990) regarded *kan4* (*look*), *ting1* (*listen*) and similar stating verbs as mental verbs, but Lü (1982) posited that the stating verbs cannot be categorized as either mental verbs or action verbs. Furthermore, mental verbs differ from action verbs in their acquisition, which is a much more prolonged process. By age 4, children can understand simple mental verbs (Moore & Furrow, 1991), but they cannot fully grasp advanced ones such as *wonder*, *guess*, *infer*, and *assume* until they reach adolescence (Astington & Olson, 1990). In contrast, due to the visibility of the activities they denote, the earliest age for acquiring action verbs is approximately 1 year old, and

* Corresponding author.
E-mail address: ldd233@163.com (D. Liang).

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many advanced action verbs can be grasped when children are 6 years old (Boulenger, Decoppet, Roy, Paulignan & Nazir, 2007).

Studies have reported that children with autism universally have difficulty understanding their own and others' mentality (Baron-Cohen, Leslie, & Frith, 1985; Frith & Happer, 1999). Hence, the ways in which they understand and use verbs describing inner mental activities or states constitute a concern in the field of autism research. Based on arguments in theoretical linguistics that the differences in semantic features between mental and action verbs lead to a specific syntactic and pragmatic performance of mental verbs (see details in Section 1.1), the present study aimed to investigate whether children with HFA show such specific syntactic and pragmatic performance with mental verbs.

1.1. The impact of semantic features on the syntactic and pragmatic features of mental verbs

With regard to the impact of semantic features, the syntactic features of mental verbs include their tendency to select a complex argument structure. The argument structure, as a level of the subcategorization of verbs (MacDonald, Pearlmutter, & Seidenberg, 1994; Trueswell, Tanenhaus, & Kello, 1993), is an important syntactic indicator of verbs. Syntactically, the verb is the core of a sentence and governs its dependents, primarily NPs or subordinate clauses. Semantically, the predicate verb (the main verb that comes after the subject) and its obligatory arguments constitute its argument structure, which determines how sentences are generated (Hare, McRae, & Elman, 2003). The argument structure of a verb is linked to its meaning, some components of which determine the syntactic behaviors of the verb. Thus, differences in semantics between verbs strongly determine their differences in syntactic behaviors (Argaman & Pearlmutter, 2002; Grimshaw, 1990; Owen & Leonard, 2006). For example, the two verbs *da3* (*hit*) and *gei3* (*give*) differ considerably in their semantic components: *da3* contains the components of "[+Agent] [+Patient] [+Strike]" with an argument structure of "Argument (agent) + *da3* + Argument (patient)", whereas *gei3* contains [+Agent] [+Recipient] [+Theme] [+Cause] [+Move] with an argument structure of "Argument (Agent) + *gei3*+ Argument (Recipient) + Argument (theme)".

To use a verb correctly, a speaker must have adequate knowledge of its argument structure. Differences in semantic type affect the selection of argument types. Hare et al. (2003) claimed that verbs with both concrete action and abstract mental meanings could generate different types of accusative arguments. For example, the verb *find* in English contains both a meaning of a concrete and actional nature—to visually *discover* a concrete object—and a meaning of an abstract and mental nature—to *discover* a mental event or an attitude. When *find* means "*discover an object*", the verb takes only a nominal object, as in "He *found* the book on the table". When *find* means "*discover a mental event or an attitude*", it has alternate argument structures: it takes either a nominal object, as in "He found *nothing but confusion*", or a clausal object, as in "He found *the plane had left without him*". Nevertheless, this verb is more likely to take a clausal object to describe an event or situation. More importantly, Hare et al. (2003) showed that the abstractness of their meanings may be the reason that mental verbs tend to select complex accusative arguments. If mental verbs and action verbs take either a nominal or clausal object, is the tendency for mental verbs to select complex accusative arguments more apparent than it is for action verbs?

A pragmatic feature of mental verbs is that mental verbs require more evidentiality to support their use (Lao, 2007; Yin, 2013). Evidentiality expresses the speaker's attitude or supporting evidence for the factuality of the proposition conveyed by the main clause. Formally, it is realized by a discourse of one or more utterances that precede or follow the main clause. Language functions as the most important tool for human communication, and its main purpose is to transmit information or propositions, which may be true or false. Therefore, when it is necessary for an individual to verify the information he or she conveys (regardless of its truthfulness), the individual usually tries all means to do so. Pragmatically, evidentiality functions to further convince the hearer of the truthfulness of the proposition expressed by the main clause. Mental verbs perform covert, weak and inner speech acts, and the hearer cannot readily determine the truthfulness conveyed by the sentence containing these verbs. Therefore, mental verbs require evidentiality more than their action counterparts do. The speaker usually needs to provide auxiliary material to facilitate comprehension of the main proposition. Lao (2007) analyzed corpora containing mental verbs and found that people tend to provide a motivation for using mental verbs. For instance, in the utterance *Wo3 xi3huan0 ping2guo3, yin1wei4 ta1 hen3tian2 (transliteration: I/like/apple, because/it/very/sweet;* translation: *I like the apple because it tastes very sweet*), the main clause *Wo3 xi3huan0 ping2guo3* (*I like the apple*) containing the mental verb *xi3 huan0* (*like*) expresses a main proposition, whereas the subordinate clause "*yin1wei4 ta1 hen3tian2* (*because it tastes very sweet*)" provides the reason why the experiencer is in the state of *xi3huan0* (like) and thus supports the proposition. Analysis of the corpora indicates that the provision of the effect caused by the mental verb can also support the proposition. For instance, in the utterance *Wo3 xi3huan0 da4hai2, mei3ge0 zhou1mo4 dou1 qu4 kan4 hai2 (transliteration: I/like/sea, every/weekend/all/go to/watch/sea;* translation: *I like the sea, I go to watch the sea every weekend*), the clause *mei3ge0 zhou1mo4 dou1 qu4 kan4 hai2* (*I go to watch the sea every weekend*) shows the effect caused by the mental verb *xi3huan0* (like), which can equally enhance the truthfulness and support of the proposition *Wo3 xi3huan0 da4hai2 (I like the sea)*. Therefore, utterances that express "cause" or "effect" around the main proposition and thus improve the trustworthiness of the latter are called "pragmatic clauses or sentences". Although the clauses *Wo3 xi3huan0 ping2guo3* (*I like the apple*) and *Wo3 xi3huan0 da4hai2* (*I like the sea*) are correct both syntactically and semantically, a skillful speaker will readily add a pragmatic clause or sentence to promote the evidential function of the utterance. Evidentiality is not required by action verbs as much as by mental verbs because action verbs denote overt external acts that are objective, observable and verifiable.