Subjectivity and Gradability: on the semantics of the possessive property concept construction in Mandarin Chinese

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(Comments are welcome)

Abstract

This paper examines the semantics of a group of gradable predicates in Mandarin Chinese, which consist of a possessive morpheme *you* 'to have' and a bare NP (e.g., *zhihui* 'wisdom'). We refer to them as possessive Property Concept (PC) predicates, following Francez and Koontz-Garboden (2010, 2015, 2017). Possessive PC predicates in Mandarin are gradable, as they share the same distribution as gradable adjectives (e.g., *gao* 'tall') or verbs (*xihuan* 'to like'): they appear in degree constructions including comparatives, superlatives, exclamatives, etc. The goal of this paper is to examine the gradability of possessive PC predicates and show how it is compositionally achieved. We observe that the gradability of possessive PC predicates correlates to whether the NP inside denotes an abstract quality (e.g., *wisdom*) or a non-abstract substance (e.g., *water*), and it also correlates to whether they express a subjective meaning: a gradable possessive PC predicate is either a predicate of personal taste (e.g., *tasty*) or an evaluative predicate (e.g., *wise*). Based on these empirical observations, we put forward an analysis that makes reference to the taxonomy of measurement types (i.e., nominal measure, ordinal scale, interval scale and ratio scale). We argue that quality NPs and non-quality NPs are associated with two distinct types of measurement scales. Quality NPs are associated with an ordinal scale, which lacks an absolute (or a relative) zero, whereas non-quality NPs are associated with a ratio scale, which contains an absolute zero. It is this distinction that decides the gradability of possessive PC predicates in Mandarin Chinese.

1. Introduction

In Mandarin Chinese, gradable predicates can be classified into two types based on their morphosyntactic features. One consists of adjectival and verbal lexemes like *gao* 'tall' in (1a) and *xihuan* 'to like' in (1b), and the other consists of verbal phrases formed by the verb *you* 'to possess, to exist' and a bare NP like *you zhihui* 'to have wisdom' in (2). While the first type of gradable predicates receives much attention in the literature, the second type goes almost unnoticed. This paper aims to fill up this gap by studying the semantics of the second type of gradable verbal phrases, which I refer to as possessive Property Concept (PC) predicates, following Francez and Koontz-Garboden (2010, 2015, 2017).

(1) a. Zhangsan hen gao. <Gradable adjective>
very tall
'Zhangsan is very tall.'

b. Zhangsan hen xihuan chi mian. <Gradable verb>
very like eat noodle
'Zhangsan likes eating noodle.'

(2) Zhangsan hen you zhihui. <possessive PC predicate>
very have wisdom
'Zhangsan has wisdom.'

The gradability of a predicate in Mandarin can be identified by checking whether it allows modification by a degree morpheme such as *hen* 'very' and whether it can be used in degree constructions like comparatives (3), superlatives (4), exclamatives (5), etc. The examples below together with the examples in (1) and (2) above show that possessive PC predicates share (almost)[1] the same distribution as gradable adjectives and verbs in degree constructions.

(3) a. Zhangsan bi Lisi gao.
COMP tall
'Zhangsan is taller than Lisi.'

b. Zhangsan bi Lisi you zhihui.
COMP have wisdom
'Zhangsan has more wisdom than Lisi.'

[1] Unlike gradable adjectives or verbs, gradable possessive PC predicates cannot be used to form degree questions. In section 4.3, we will address this contrast.

(i) a. Zhangsan duo gao?
how tall
'How tall is Zhangsan?'

b. ??Zhangsan duo you zhihui?
how have wisdom
Int: 'How wise is Zhangsan?

(4) a. Zhangsan zui gao.
SUP tall
'Zhangsan is the tallest.'
b. Zhangsan zui you zhihui.
SUP have wisdom
'Zhangsan has the most wisdom.'

(5) a. Zhangsan duo gao ah!
how tall Prt
'How tall Zhangsan is!'
b. Zhangsan duo you zhihui ah!
how have wisdom Prt
'How wise Zhangsan is!

Before examining their semantics, it is important to show that possessive PC predicates are a productive syntactic structure rather than an idiomatic expression. Their syntactic productivity is evidenced by a non-exhaustive list of existing possessive PC predicates in Mandarin Chinese and newly coined expressions. The table in A provides more examples of possessive PC predicates in Mandarin.

Table A: Possessive PC predicates in Mandarin Chinese

you + NP	Gloss	Eng. Trans.
you daoli (有道理)	have reason	make sense
you xuewen (有学问)	have knowledge	Knowledgeable
you qu (有趣)	have fun	Fun
you yongchu (有用处)	have use	Useful
you mingqi (有名气)	have fame	Famous
you jiazhi (有价值)	have value	Valuable
you ke'neng (有可能)	have possibility	Possible
you xiwang (有希望)	have hope	Hopeful
you weidao (有味道)	have taste	Tasteful

In addition, speakers are creatively inventing new possessive PC predicates. (6) and (7) exemplify two newly coined expressions. The first one is *you ai* or *you love* 'have love' which means caring (when used to describe people) (6a) or cozy (when used to describe places) (6b).

(6) New Expression 1: *you ai* or *you love* 'have love': caring, cozy

a. Zhangsan changchang bangzhu wo; ta hen you ai.
often help me he very have love
'Zhangsan often helps me; he is very caring.'

b. Zhe ge fangjian hen you ai.
this Cl room very have love
'This room is very cozy.'

The second new expression is *you ganjue* or *you feel* 'have feel', which means classy or unique.

(7) New Expression 2: *you ganjue* or *you feel* 'have feel': classy, unique
zhe bu dianjing de ge hen you ganjue.
This Cl movie Poss song very has feel
'The songs in this movie are very unique.'

(6) and (7) show that native speakers have an active knowledge of constructing possessive PC predicates, which lends strong support to their productivity.

Interestingly, not all NPs in Mandarin Chinese can combine with the verb *you* to form a gradable possessive PC predicate. The gradability of the possessive PC predicates does not correspond to the mass and count distinction of the NP inside, as shown by (8) and (9).

(8) a. fangzi-li you ren. <count noun>
house-inside have people
'There are people inside the house.'
b. *fangzi-li *hen* you ren.
house-inside very have people
Int: 'There are many people inside the house.'

(9) a. beizi-li you shui. <mass noun>
cup-inside has water
'There is water inside the cup'
b. *beizi-li *hen* you shui.
cup-inside very has water
Int: 'There is a lot of water inside the cup.'

Hence, questions arise: what kind of NPs are allowed in PC possessive predicates? How do they condition the gradability of possessive PC predicates? In the rest of the paper we will address these two questions. Mainly, we show that NPs inside gradable possessive PC predicates are a subclass of mass nouns, which denote abstract quality rather than non-abstract substance. We refer to them as 'quality' NPs. We argue that quality NPs differ from non-quality NPs in that the former are associated with an ordinal scale, which lacks a zero point, whereas the latter are associated with a ratio scale, which contains an (absolute) zero point. It is this difference that conditions the gradability of possessive PC predicates.

The rest of the paper is structured as follows. In section 2, we show that the gradability of a possessive PC predicate correlates to its subjective meaning: a gradable possessive PC predicate is either a predicate of personal taste or an evaluative predicate. Section 3 provides a brief review of Francez and Koontz-Garboden (2015, 2017)'s proposal of the possessive PC predicate in Ulwa (Misumalpan, Nicaragua). We show that directly extending their proposal to Mandarin Chinese encounter difficulties. In section 4, we put forward a proposal that makes reference to the taxonomy of measure types (Stevens 1946, 1975). We show that the gradability of a

possessive predicate (i.e., *you* + NP) is conditioned by different types of scales that quality and non-quality NPs are associated with.

2. Gradability and subjectivity

In this section, we show that the gradability of a possessive PC predicate correlates with its subjective meaning. This correlation is supported by four sets of evidence: (i) the faultless disagreement test; (ii) the (dis-)ambiguity test; (iii) their semantic relations to subjective attitude predicates (e.g., *find*), and (iv) morphological evidence.

The most common diagnostic for subjectivity involves truth assessment. It has been often observed that sentences with a subjective predicate have a relative truth, that is, their truth appears to be a matter of opinion rather than a matter of fact (Lasersohn, 2005, 2009; Stephenson, 2007; Bylinina 2016; a.m.o.). Consider the truth-values of the two sentences in (10) and (11).

(10) Context: Anna and Kim argue about whether there is water in the cup.

a Anna: zhe ge beizi li you shui.
this Cl cup inside have water
'There is water in the cup.'

b Kim: bu dui, zhe ge beizi li mei you shui.
not correct this Cl cup inside Neg has water
'No, there is no water in the cup.'

(11) Context: Anna and Kim argue about who has more wisdom.

a. Anna: Zhangsan bi Lisi you zhihui.
COMP have wisdom
'Zhangsan has more wisdom than Lisi.'

b. Kim: bu dui, Lisi bi Zhangsan you zhihui.
not correct, COMP have wisdom
'No, Lisi has more wisdom than Zhangsan.'

In both (10) and (11) Anna and Kim disagree with each other. However, intuitively in (10) only one of the speakers, Anna or Kim, can be correct about whether there is water in the cup, whereas in (11) both of them can be correct. Such an exchange like (11) is known as a faultless disagreement (Lasersohn, 2005, 2009; Stephenson, 2007). Possessive PC predicates give rise to such a linguistic phenomenon, but non-gradable possessive predicates like *you shui* 'have water' in (10) do not.

The second set of evidence in support of the correlation between subjectivity and gradability of possessive PC predicates comes from the behavior of a set of predicates that are ambiguous between a subjective and a non-subjective meaning, as shown in (12).

(12) Zhangsan you wenti.
have question
(i) Zhangsan has a question. (non-subjective)
(ii) Zhangsan is problematic. (subjective)

The example in (12) is ambiguous between two distinct readings: (i) Zhangsan has a question, which is an objective description, and (ii) Zhangsan is problematic, a subjective judgement. This ambiguity disappears once the sentence is embedded in a degree construction, as shown in (13).

(13) a. Zhangsan hen you wenti.
very have question
(i)*Zhangsan has many questions. (*non-subjective)
(ii) Zhangsan is very problematic. (subjective)

b. Zhangsan bi Lisi (geng) you wenti.
COMP (even) have question
(i)*Zhangsan has more questions than Lisi. (*non-subjective)
(ii) Zhangsan is even more problematic than Lisi. (subjective)

In the same vein, NPs like *shendu* 'depth' are conventionally associated with a dimensional sense (e.g., the depth of water) and an evaluative sense (e.g., the depth of love). Possessive PC predicates containing such an NP only have an evaluative reading, as shown in (14).

(14) a. *zheli de shui hen you shendu.
here Poss water very have height
Int: 'The water here is very deep'.

b. zhe ge wenti hen you shendu.
this Cl question very have height
'This question is deep.'

The subjectivity of possessive PC predicates can also be identified through their semantic relation to subjective attitude verbs such as *juede* 'to feel, to find'. A sentence with a non-gradable possessive predicate like (15a) expresses an objective description. Embedding this sentence under the subjective attitude verb *juede* 'to feel' turns the sentence into a subjective statement (15b).

(15) a. beizi li you shui. < Non-gradable >
cup inside have water
'There is water in the cup.'

b. wo juede beizi li you shui.
I feel cup inside have water
'I feel that there is water in the cup.'

However, for possessive PC predicates, the situation is different. Both (16a) and (16b) are subjective statements. (16b) differs from (16a) in that *juede* 'to feel, to find' relates the statement to a judge; (16b) means that in my opinion, Zhangsan has a lot of wisdom.

(16) a. Zhangsan hen you zhihui. < Gradable >
very have wisdom
'Zhangsan has a lot of wisdom.'

b. Wo juede Zhangsan hen you zhihui.
I feel very have wisdom

'I feel that Zhangsan has a lot wisdom.'

Lastly, morphological evidence also points to the correlation between subjectivity and gradability of possessive PC predicates. The suffix *gan* 'a feel of, a sense of' in Mandarin expresses a subjective feeling. all NPs with this suffix can combine with the verb *you* 'to possess, to exist' to form a gradable possessive PC predicate. Table B below provides some examples of this kind.

Table B: NP bearing the suffix *gan* 'a feel of, a sense of'

	NP-gan	**Gloss**
hen you	youmo-**gan** '幽默感'	humor-feel
	xingfu-**gan** '幸福感'	happiness-feel
	juli-**gan** '距离感'	distance-feel
	anquan-**gan** '安全感'	safty-feel
	qinqie-**gan** '亲切感'	friendliness-feel
	shuxi-**gan** '熟悉感'	familiarity-feel

To summarize, two empirical generalizations arise from the examples above. First, there is a clear correlation between the gradability of possessive PC predicates and their subjective meanings: possessive PC predicates are either predicates of personal tastes (e.g., *tasty*) or evaluative adjectives (e.g., *wise*). Second, there is a sense that the NP inside the Possessive PC predicate are 'abstract nouns of sensory quality' (Parsons 1955)—they denote abstract quality (e.g., wisdom) rather than concrete objects (e.g., water). These empirical facts raise two theoretical questions: what is the semantic distinction between quality (e.g., wisdom) and non-quality NPs (e.g., water) that conditions the gradability of a possessive predicate? What underlies the correlation between gradability and subjectivity in possessive PC predicates? Before answering these questions, in the following section we briefly review Francez and Koontz-Garboden (2015, 2017)'s proposal of possessive PC predicates in Ulwa (Misumalpan, Nicaragua). We show that directly extending their analysis to Mandarin Chinese does not provide a satisfactory answer for the questions we raised.

3. Existing proposal and its extension to Mandarin Chinese

3.1 Francez and Koontz-Garboden (2015, 2017)

Francez and Koontz-Garboden (2010, 2015, 2017) observe that crosslinguistically there are many languages like Mandarin Chinese which has two types of Property Concept (PC) lexemes: PC adjectives (e.g., *wise*), and PC nominals (e.g., *wisdom*). The latter often trigger 'possessive strategies of predication', in which PC nominals combine with a possessive or an existential morpheme to form a PC predicate.

TYPE	LANGUAGE	PARAPHRASE
Nominal possessive marking	Ulwa	—
'have'	Ulwa, Huitoto, Hausa	She has strength.
		She is with strength.
Existential: BEARER pivot	Hausa	There is her with strength.
Existential: PROPERTY pivot	Hausa	There is strength at her.
Existential: possessive NP pivot	Bisa	There is her strength.

TABLE 1. Possessive strategies of predication.

(Francez and Koontz-Garboden 2015, 542)

Francez and Koontz-Garboden (2015, 2017) propose that PC nominals (e.g., *wisdom*) are semantically distinct from other mass nouns (e.g., *water*). The former denote a set of 'portions' of substances. For instance, *wisdom* has the semantics in (17); it denotes a set of portions of wisdom.

(17) $[[wisdom]] = \lambda p_p.\ \text{wisdom}(p)$

Portions are a primitive entity (of type *p*).[2] They are subject to a total preorder ≤ (smaller than or equal to). As such, the semantics of *wisdom* is distinct from that of *water*, which is a set of water substance partially ordered by a mereological part-whole relation (Link 2002).[3]

(18) $[[water]] = \lambda x_e.\text{water}(x)$

Given its semantics in (17), *wisdom* cannot serve as a predicate of an individual. It combines with the possessive morpheme *have* to form a Possessive PC predicate. The function of *have* is to relate individuals to portions, as shown in (19).

(19) $[[have]] = \lambda P_{<p,t>}\lambda x\lambda D.\exists^{D}z[P(z) \wedge \pi(x, z)]$

In (19), P is variable over (abstract) substances. π is a possessive relation. D is a variable over sets of portions; it provides a domain restriction for the existential quantifier such that the value of *z* is restricted to portions that count as 'big enough' in the context. Composing *have* with the quality NP *wisdom* and the subject *John* yields the truth-conditions for the sentence *John has wisdom*, as shown in (20).

(20) $[[John\ has\ wisdom]] = \exists^{D}z[\text{wisdom}(z) \wedge \pi(\text{John}, z)]$

(20) says that the sentence is true iff there is a portion of wisdom that counts as 'big enough' in the context and John possesses it.

Extending Francez and Koontz-Garboden's analysis directly to possessive PC predicates in Mandarin Chinese encounters a difficulty. In Mandarin Chinese, possessive PC predicates and gradable adjectives share the same distribution in degree constructions (ex.1-5). On the standard degree-based analyses, gradable adjectives denote relations between individuals and degrees.

[2] Francez and Koontz-Garboden (2015, 548) on footnote 19 observe: "We take portions to be a sort of individual, that is, a subtype of type *e*, the type of simple individuals".

[3] Francez and Koontz-Garboden (2015, 454) also proposes that the preorder ≤ preserves the mereological part-of relation, so that given a substance *P*, and two portions $p, q \in P$: $p \subseteq q \rightarrow p \leq q$.

For instance, gradable adjective *gao* 'tall' in (21a) denotes a relation between an individual *x* and *x*'s heights (of type <*d, <e, t*>>). It would be ideal if we could give PC predicates the same semantics as gradable adjectives (21b).

(21) a. [[*gao*]] = λdλx. height(x) ≥ d
b. [[*you zhihui*]] = λdλx. [wisdom(d) ∧ π(x, d)]

In the following section, we reinterpret Francez and Koontz-Garboden's portion-based analysis under a degree-based framework, and show that such an analysis still does not provide a satisfactory explanation for the Chinese data.

3.2 A degree-based interpretation of Francez and Koontz-Garboden (2015, 2017)

On a degree-based analysis, we assume that PC nominals are scale denoting. *Wisdom*, instead of denoting a set of portions, denotes a set of degrees on a scale of wisdom (22a). The role of the possessive morpheme *you* is to relate individuals to scales (23b).

(22) a. [[*zhihui*]] = λd. wisdom(d)
b. [[you_{gradable}]] = $\lambda P_{<d,t>}\lambda d\lambda x.[P(d) \wedge \pi(x, d)]$
c. [[*you zhihui*]] = λdλx. [wisdom(d) ∧ π(x, d)]

Moreover, we need an interpretation for the non-gradable possessive morpheme $you_{non\text{-gradable}}$ such that when it combines with a mass noun like *shui* 'water', the result is a non-gradable possessive predicate, as shown in (23)

(23) a. [[*shui*]] = λx_e.water(x)
b. [[$you_{\text{non-gradable}}$]] = $\lambda P_{<e,t>}\lambda x.\exists z[P(z) \wedge \pi(x, z)]$
c. [[*you shui*]] = λx.∃z[water(z) ∧ π(x, z)]

Although this degree-based analysis accounts for the gradability of possessive predicates, it leaves several important questions open. First of all, the presence and absence of the degree argument in the semantics of *you* in (22b) and (23b) seems stipulative. There is no clear explanation for how the degree semantics of the quality NP inside decides the gradability of the whole phrase. Second, this degree-based analysis fails to capture the correlation between gradability and subjectivity as we have seen in section 2; neither does it address why such a correlation exists.

4. Proposal

In this section we propose an analysis that makes reference to the taxonomy of measure types (i.e., nominal-scale, ordinal-scale, interval-scale and ratio-scale measures) (Stevens 1946, 1975). We argue that PC nominals (e.g., *wisdom*) and non-quality mass nouns (e.g., *water*) are related to two different measure types: the former are related to an ordinal-scale measure, while the latter are related to a ratio-scale measure. The distinctions between these two measure types underline

the many differences between gradable and non-gradable possessive predicates in Mandarin Chinese.

4.1 Taxonomy of measure types

Measurement theory offers four-level classification of measure types: nominal-scale, ordinal-scale, interval-scale and ratio-scale measures (Stevens 1946, 1975). Below we briefly look at each type and explain their main differences.

The first level in the classification is the nominal-scale. The main function of this measure type is to indicate the equality and inequality of two entities. No ordering is imposed on the values of a nominal scale. Examples include the truth-values {T, F}(or {1, 0}), gender selection {F, M}, and lexical categories {Nouns, Verbs, Adjectives, etc.}

The second level in the classification is the ordinal-scale. The ordinal-scale measure indicates not only the equality and inequality of entities but also their ranking (e.g., 1^{st}, 2^{nd}, 3^{rd}, etc.). Differences between values on an ordinal scale are not meaningful. Examples include the ranking of participants in a swimming competition (i.e., first prize, second prize, third prize, etc.).

The third level in the classification is the interval scale, where in addition to all the features of an ordinal scale, equal differences between values represent equal intervals. Also, the zero point on the scale is arbitrary and negative values can be used. Examples include the year date in calendars and temperature in the Celsius or Fahrenheit scale. The fact that the water freezing point is mapped to the 0◦C is arbitrary. The freezing point does not correspond to non-existence of temperature, in fact it corresponds to 273◦K.

The fourth level in the classification is the ratio scale, which has all the functions of an ordinal scale and a meaningful non-arbitrary zero. Examples are most conventional measurement scales including length, weight, age measures.

4.2 Measurement theory and gradability of possessive predicates

In light of the measurement theory above, we propose that PC nominals (e.g., *wisdom*) and non-quality mass nouns (e.g., *water*) are related to two different measure types: the former are related to an ordinal-scale measure, while the latter are related to a ratio-scale measure. Both scales permit a total ordering of degree values, but only a ratio-scale contains an absolute zero point.

We further propose that the semantics of the possessive morpheme *you* 'to have' makes reference to the (absolute or relative) zero point on a scale. It indicates that the quantity of the relevant substance denoted by the NP is greater than (absolute or relative) zero. This semantics is spelled out in (24).

(24) $[[you]] = \lambda P_{<e,t>}\lambda d\lambda x.\ \exists z[P(z) \wedge \pi(x, z) \wedge |z| \geq d \wedge d > 0_{a/r}]$

In (24), *you* composes with *P*—a set of substance, and yields a relation between individual *x* and degree *d* such that *x* possesses some *P*-substance whose quantity is greater than an absolute or a relative zero--$0_{a/r}$. Below we consider how *you* composes with a PC nominal like *zhihui* 'wisdom' and a non-quality noun like *shui* 'water' to derive gradable and non-gradable possessive predicates.

Let us start with the non-gradable possessive predicate like *you shui* 'have water'. We assume that NPs like *shui* are associated with a ratio scale, which contains an absolute zero point.

The possessive morpheme *you* indicates that the quantity of the relevant substance is greater than the absolute zero, as shown in (25b). Composing the denotation of water in (25a) with that of *you* in (25b) returns the semantics in (25c)—a relation between individual *x* and degree *d* such that *x* possesses a non-zero quantity of water.

(25) a. $[[shui]] = \lambda x_e.\text{water}(x)$
b. $[[you]] = \lambda P_{<e,t>}\lambda d\lambda x.\ \exists z[P(z) \wedge \pi(x, z) \wedge |z| \geq d \wedge d > 0_a]$
c. $[[you\ shui]] = \lambda d\lambda x.\ \exists z[\text{water}(z) \wedge \pi(x, z) \wedge \mathbf{|z| \geq d \wedge d > 0_a}]$

However, a careful examination of the formula in (25c) reveals that the last two conjuncts--$|z| \geq d \wedge d > 0_a$ are in fact redundant, as their semantics are already entailed by the logical existential quantifier: $\exists z$ means that there is some z whose quantity is greater than (absolute) zero. It follows that there is no need for the semantics of *you shui* to project a degree argument as the conjuncts involving the degree variable are not indeed necessary. Without the degree argument, (25c) and (26) are truth-conditionally equivalent.

(26) $[[you\ shui]] = \lambda x.\ \exists z[\text{water}(z) \wedge \pi(x, z)]$

Turning to the gradable possessive PC predicate, let us consider the semantics of *you zhishui* 'have wisdom'. We assume that *zhihui* 'wisdom' in (27a) denotes a set of substance parallel to that of the NP *shui* 'water' in (25a). Assuming that *zhihui* 'wisdom' is associated with an ordinal scale that does not contain an absolute or a relative zero point, when it composes with the possessive morpheme *you*, it forces the scale to contain a relative zero point—0_r, whose value is set to be an arbitrary point on the scale decided by the judge, as shown in (27b-27c).

(27) a. $[[zhishui]] = \lambda x_e.\ \text{wisdom}(x)$
b. $[[you]] = \lambda P_{<e,t>}\lambda d\lambda x.\ \exists z[P(z) \wedge \pi(x, z) \wedge |z| \geq d \wedge d > 0_r]$, where 0_r is an arbitrary point on a scale decided by the judge.
c. $[[you\ zhihui]] = \lambda d\lambda x.\ \exists z[\text{wisdom}(z) \wedge \pi(x, z) \wedge |z| \geq d \wedge d > 0_r]$, where 0_r is an arbitrary point on a scale of wisdom decided by the judge.

In (27c), the last two conjuncts--$|z| \geq d \wedge d > 0_r$ are not entailed by the logical existential quantifier due to the relative zero--0_r, which results in the obligatory presence of the degree argument. Also, because the value of 0_r can be any arbitrary point on an ordinal scale decided by the judge, it accounts for the correlation between gradability and subjectivity.

4.3 Consequences

Our analysis makes several predictions. First, given that a ratio scale starts with an absolute zero point, it is not possible to define negative values on a ratio scale. A nominal scale, on the other hand, contains no absolute zero point; negative values can be defined as values that are ordered below a relative zero. Assuming that quality and non-quality NPs are associated with an ordinal scale and a ratio scale respectively, it is predicted that for non-gradable predicates like *you shui* 'have water', it is not possible to specify or modify their negative values, as shown by the ungrammaticality of (28b). However, for gradable possessive PC predicates, it is indeed possible to do so, as shown by (29b).

(28) a. beizi-li mei you shui.
cup-inside Neg has water
'There is no water inside the cup'

b. *beizi-li hen mei you shui.
cup-inside very Neg has water
Int: 'this cup lacks water

(29) a. Zhangsan mei you zhihui.
Neg have wisdom
'Zhangsan has no wisdom.'

b. Zhangsan hen/feichang/tai mei you zhihui.
very/extraordinarily/too Neg have wisdom
'Zhangsan lacks wisdom to a great extent.'

Secondly, as our analysis of possessive PC predicates makes reference to a relative zero point whose value is determined by the judge, it is predicted that degree constructions involving possessive PC predicates are evaluative. This prediction is indeed borne out. The comparative in (3a) that involves the gradable adjective *gao* 'tall' does not entail that either Zhangsan or Lisi is tall, but (3b) does--(3b) entails that both Zhangsan and Lisi have wisdom.

(3) a. Zhangsan bi Lisi gao.
COMP tall
'Zhangsan is taller than Lisi.'

b. Zhangsan bi Lisi you zhihui.
COMP have wisdom
'Zhangsan has more wisdom than Lisi.'

Thirdly, as an ordinal scale does not specify differences between values, our analysis predicts that possessive PC predicates are not licensed in degree constructions that express differences between two values. These degree constructions include differential comparatives that express differences between two entities under comparison and degree questions that expresses differences between the maximal value an entity has and an absolute or a relative zero. This prediction is also borne out.

The two examples in (30) demonstrate how differentials are used in adjectival and verbal comparatives. In (30a), an adjectival comparative, the differential *hen duo* 'a lot' immediately follows the adjective *gao*. In (30b), a verbal comparative, the differential *duo* appears after the reduplicative verb *xihuan* and the functional morpheme *-de*. The ungrammaticality of the two sentences in (31) show that comparatives involving possessive PC predicates do not admit differentials, no matter in which form.

(30) a. Zhangsan bi Lisi gao hen duo.
COMP tall very much
'Zhangsan is a lot taller than Lisi.'

b. Zhangsan bi Lisi xihuan kan-shu xihuan-De duo.
COMP like read-book like-De much

'Zhangsan like reading a lot more than Lisi.'

(31) a. ??Zhangsan bi Lisi you zhihui hen duo.
COMP have wisdom very much
b. *Zhangsan bi Lisi you zhihui you-De duo.
COMP have wisdom have-De much
Int: 'Zhangsan has a lot wisdom than Lisi.'

The examples in (32) show that degree questions are formed by placing the question word *duo* 'how' in front of a gradable adjective or a gradable verb. However, placing *duo* in front of a possessive PC predicate does not yield an acceptable degree question, as shown in (33).

(32) a. Zhangsan duo gao?
how tall
'How tall is Zhangsan?'
b. Zhangsan duo xihuan kan-shu?
how like read-book
'To what extent does Zhangsan like reading?'

(33) ?? Zhangsan duo you zhihui?
how have wisdom
'How much wisdom does Zhangsan have?'

5. Conclusion

In this paper, we examined the semantics of a group of gradable predicates in Mandarin Chinese which consist of a possessive morpheme *you* 'to have' and a bare NP (e.g., *zhihui* 'wisdom'). We refer to them as possessive Property Concept (PC) predicates, following Francez and Koontz-Garboden (2010, 2015, 2017). Possessive PC predicates are gradable as they share (almost) the same distribution with gradable adjectives (e.g., *gao* 'tall') and gradable verbs (e.g., *xihuan* 'to like') in degree constructions.

We show that the gradability of possessive PC predicates does not correlate to the mass-count distinction of the NP inside, but to whether the NP denotes an abstract quality or a non-abstract substance, and it also correlates to subjectivity: a possessive PC predicate is either a predicate of personal taste or an evaluative predicate. Based on these empirical observations, we propose that quality and non-quality NPs are associated with different measurement scales: quality NPs are associated with an ordinal scale, while non-quality NPs are associated with a ratio scale. Among many differences, an ordinal scale differs from a ratio scale in whether they contain a zero: the former does not, while the latter does. The semantics of *you* is sensitive to this distinction; it indicates that the quantity of the relevant substance is greater than (an absolute or a relative) zero. When *you* combines with a quality NP, it forces a relative zero point on an ordinal scale associated with the NP, and this relative zero can be any arbitrary point decided by the judge.

If our analysis is on the right track, it provides evidence to show that natural language is sensitive to taxonomy of measurement types, and gradable predicates may be associated with different types of scales (Sassoon 2011).

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