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Prof. William Bright, 1625 Mariposa Avenue
Boulder, Colorado 80302, USA

Fax: + 303-413-0017, Email: william.bright@colorado.edu

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WRITTEN LANGUAGE AND LITERACY

VOLUME 5 NUMBER 2 2002

Special Issue

*Cross-Linguistic Perspectives
on the Development of Text-Production Abilities
in Speech and Writing (Part 2)*

Edited by Ruth A. Berman & Ludo Verhoeven

The studies reported in this volume of WL&L (5: 1-2, 2002) all derive from a joint project entitled "Developing literacy in different contexts and in different languages", funded by the Spencer Foundation, Chicago. The study encompasses seven languages — Dutch, English, French, Hebrew, Icelandic, Spanish, and Swedish — for which data were collected in Europe, Israel, and the US by graduate research assistants in education, linguistics, and psychology, under the supervision of a project director in each country — each of whom is listed as a first or "lead" author in the articles which follow the introduction to this collection.

John Benjamins Publishing Company
Amsterdam/Philadelphia

Written Language & Literacy

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Propositional attitudes in written and spoken language*

Judy S. Reilly, Elisheva Baruch, Harriet Jisa and
Ruth A. Berman

Université de Poitiers (Reilly) / San Diego State University (Reilly) / Tel Aviv
University (Baruch, Berman) / Université Lyon 2 (Jisa)

This study considers the use of modal expressions (auxiliaries like *should*, *can*), semi-modals (e.g. *have to*, *be likely to*), and adverbials and complement-taking expressions (*maybe*, *it is possible that*) to convey the attitudes and feelings of speaker/writers about the events they describe and the ideas they express. The topic of "propositional attitudes" thus overlaps with the domains of linguistic analysis known as "mood and modality." This paper considers selected facets of linguistic modality in developmental and cross-linguistic perspective.

1. Introduction

The notion of modality (cf. Palmer 1986) typically applies to modulation of the basic referential content of a proposition, in order to express an attitude towards the desirability, necessity, possibility, or likelihood that a particular state of affairs will obtain. In the introduction to their collection on this general topic, Bybee & Fleischman (1995:2) define modality as the semantic domain pertaining to elements that languages use to express the addition of a

supplement or overlay of meaning to the most neutral semantic value of the proposition of an utterance, namely factual and declarative. [As such] it covers a broad range of semantic nuances — jussive, desiderative, intensive, hypothetical, potential, obligative, dubitative, hortative, exclamatory etc.

All these notions have in common the fact that they serve for "expression of the SUBJECTIVE attitudes of the speaker in relation to a situation" (Aksu-Koç 1988: 14).

Linguists and philosophers have proposed a range of different, overlapping, and sometimes contradictory categories in characterizing linguistic modality. Thus Jespersen (1924:313) deals with mood as a "syntactic, not a notional category", expressing "certain attitudes of mind of the speaker towards the contents of the sentence." He divides these into two main subclasses — those which contain "an element of will" (e.g. compulsory, hortative, and jussive), and those which do not (e.g. assertive, presumptive, and dubitative). This is consistent with the subcategorizations proposed in the philosophical tradition, as in the distinction which von Wright 1951 made among ALETHIC modes of truth, EPISTEMIC modes of knowing, DEONTIC modes of obligation, and EXISTENTIAL modes of existence. To these can be added the category of BOULOMAI or VOLITIVE modality, expressing volition, intention, or desirability (Palmer 1986:12, 116–21).

As noted by Lyons (1977:787–849), logicians have been primarily concerned with alethic modality, concerning the necessary or contingent truth of propositions. In contrast, linguists from various perspectives focus on the contrast between epistemic and deontic modality. In general terms, epistemic modality concerns the level of knowledge or degree of belief about the certainty or possibility of a given state of affairs, while deontic modality concerns the obligatoriness or necessity that a certain state of affairs will obtain. For example, Chung & Timberlake (1985:242, 246) say that "the epistemic mode characterizes the actuality of an event in terms of alternative possible situations, or worlds", while "the deontic mode characterizes an event as non-actual by virtue of the fact that is imposed on a given situation."

Texts on interpersonal conflict (the thematic domain of our study) appeared to us to provide an excellent context for examining the expression of such "propositional attitudes." This is illustrated by the following expository text, quoted in its entirety — written by a woman majoring in the humanities, studying in graduate school at a California university. Linguistic forms expressing propositional attitudes are printed in italics, and the semantic type of modality is indicated in curly brackets. Identification of subject and texts is given in square brackets at the end.¹

- (1) *Conflict is a matter that I believe {BELIEF} needs to be handled {NECESSITY/OBLIGATORINESS} in a case-by-case manner. The manner in which people decide to {INTENTION} handle conflict needs to be {NECESSITY/OBLIG} thoughtfully considered, as the person or people with whom the conflict is with [sic] and the reasons for the conflict will warrant {DESIRABILIKTY} a different approach for different instances. Sometimes*

conflict will need to be {NECESSITY/OBLIG} addressed directly since it can harm {POSSIBILITY} an individual's well-being. It may cause {POSSIBILITY} damage emotionally and/or physically. In this case I believe {BELIEF} that the problem must be {NECESSITY} addressed. In other cases I believe {BELIEF} that it may be worked out {POSSIBILITY} within oneself. In this case I only advise it {DESIRABILITY}, if addressing {CONDITION} the conflict will cause {LIKELIHOOD/PREDICTION} additional problems and {PREDICTION+GAP} worsen the situation. Along these lines, addressing some conflicts may put {POSSIBILITY} an individual in danger and should simply be handled {ADVISABILITY} by shrugging it off and/or walking away.

In any case, I feel {AFFECT/BELIEF} that people involved in a conflict need to {NECESSITY/OBLIG} consider thoughtfully {THINKING} the reason for the conflict, how it is affecting them, how it affects the other person or people involved, and how the conflict may best be handled {POSSIBILITY+PREFERENCE} Importantly {EVALUATION} I feel {AFFECT/BELIEF} that it is a valuable exercise {EVALUATION/ADVISABILITY} to not only consider one's own feelings about the problem at hand, but to try very hard {INTENTION} to put oneself in the shoes of the other. This could help {POSSIBILITY} to make for a more pleasant confrontation or resolution, and it could facilitate {POSSIBILITY} a decision about how to approach the situation in the first place.

In sum, conflict must be resolved {NECESSITY} whether directly or indirectly, and these resolutions differ on an incident-by-incident basis. [Ea04fewa]

Nearly every one of the 37 clauses in this text expresses some kind of modification of, or propositional attitude towards, the neutral referential content of the statements it contains. The entire text relates to possible states of affairs, the contingencies surrounding them, the consequences that they might incur, and the author's thoughts and feelings about the decisions or actions that should be taken with respect to these possible states of affairs.

A range of different propositional attitudes also find expression in the following expository text written by a Hebrew-speaking high-school girl (in 5 out of 21 clauses).

- (2) *ani xoshevet she-biglal she-anaxnu xayim bi-medina, she-loh loh mufredet mi-dat, kayemet gizanut be-shefa.*
'I think that because we live in a country [= state] which is not separated from religion, racism exists very widely.'

ve-hayiti menaxeshet she-davka bi-medina asher hitxila me-ratson shel am sanu tiye yoter sovlarit ve-mekabelet mishum she-hi xavta et ha-tsad ha-sheni.
 'And I would assume that just such a country that arose from the need of a hated people would be more tolerant and accepting because it experienced the other side.'

yaxol liyot she-loh me yaxsim lekax maspik xashivut ba-xevra ha-yisraelit?
 'Could (it to) be that (people) don't attribute enough importance to it in Israeli society?'

yaxol liyot she-meuxar miday lexanex yeladim she-horehem xinxu otam she-kvutsa iks ve-iks hi kax?

'Could (it to) be that (it is) too late to educate children whose parents taught them that group X or Y is like that?'

yaxol liyot she-anaxnu nilxamim betoxenu milxama kara she-rak meforeret et ha-xevra ha ravgonit hazo she-anu xayim ba.

'(It) could (to) be that we are-fighting internally a cold war that only tears apart this heterogeneous society in which we live.'

davka biglal she-anaxnu kol-kax shonim; davka biglal ze, tsarix liyot lanu ha-koax ve ha-nisayon liyot sovlanim exad imm ha-sheni.

'Just because we are so different, just for that reason, should to-be to-us [=we should have] the strength and experience to be tolerant towards one another.' [Hh01fewa]

In cross-linguistic terms, the propositional attitudes expressed in Hebrew (2) occur in rather different syntactic constructions than those in English (1), as indicated by elements in parentheses and in square brackets in the English translation of example 2. Most noticeably, except for the first construction (lit. 'was-1.SG.guess-FEM' = 'I would assume'), they occur in subjectless sentences, where English speaker/writers might use *It might be that* or *We should have*. These differences are considered in the analyses presented in §§4.3–4.4 below.

Underlying our present study was the assumption that deontic modality, as defined above, derives from cultural value systems, and so would be more dominant in the attitudes which younger children expressed toward the ideas they discussed and the events they narrated in their texts. With age, we expected a developmental shift towards more cognitively based attitudes, relating to states of knowledge about these ideas and events. The theme of interpersonal conflict affords a rich domain for tracing the development of these propositional attitudes — and for testing our "from deontic to epistemic" hypothesis among children of different ages, writing in different languages, and producing

texts which both describe personal experience with events and discuss issues of interpersonal conflict. In fact, the idea of analysing propositional attitudes emerged as of interest for our study as a result of two independent observations reached by researchers working in different languages. In inter-genre perspective, expressions of modality were far more frequent in the expository than in the narrative texts, across Age and Language. In developmental terms, the expository texts of the youngest group appeared to present highly prescriptive and judgemental attitudes to the issue of interpersonal conflict (§4 below), as opposed to adults, who discuss them in terms of contingencies and possible outcomes.

2. Predictions

Against this background, we made the following predictions.

2.1 Obligations and prohibitions

We predicted that younger children, of grade-school age (9–10 years), would make reference mainly to obligations/prohibitions; i.e., they would favor the deontic dimension of modality, reflecting prescriptively judgemental attitudes toward interpersonal conflict. Older speaker/writers, from high-school age and more markedly in adulthood, would include contingencies or likely states of affairs perceived as possible causes or consequences of interpersonal conflict, and they would express mainly epistemic attitudes that reflect a more abstract or objective view of the topic.

2.2 Inter-genre differentiation

We predicted that inter-genre differentiation would be manifested from the youngest age group, with subjects using more modal expressions in expository than in narrative texts. It was expected that this distinction would be less extreme with age, reflecting a move "from dichotomy to divergence", as discussed by Berman & Verhoeven 2002 (§4.1).

2.3 Subject reference

It was predicted that these inter-genre differences would also be reflected in the type of Subject Reference associated with modalized propositional attitudes.

It was predicted that agent-oriented subjects with specific reference would occur mainly in narrative texts, reflecting inter-genre differences from the youngest age-group, across the sample. However, it was expected that there would be development in the type of non-agent-oriented subjects occurring in the expository texts: Younger children would use mainly generic and occasionally impersonal reference in expressing propositional attitudes; older subjects, especially the adults, would relate their propositional attitudes to more abstract and propositional subjects, reflecting a more cognitive or "topic-focused" approach, rather than a socio-culturally conditioned approach, to issues of interpersonal conflict.

2.4 Form vs. function

It was predicted that, with age, a considerable expansion would occur in the encoding of relations between (linguistic) form and (discourse) function — in both directions. Older subjects would express a broader range of propositional attitudes, and they would use a larger repertoire of forms, including increased lexical diversity and a variety of morpho-syntactic constructions. This broadening would reflect not only increased reliance on advanced vocabulary and higher register usages, but also a multi-dimensional perspective on the issues.

2.5 Expression of modality

In cross-linguistic terms, it was predicted that children would, from the beginning, avail themselves of the lexical forms and morphosyntactic constructions favored for expression of the relevant propositional attitudes in their language. English speaker/writers would rely mainly on verb-associated modal auxiliaries like *should*, *can*; speakers of French, and especially of Hebrew (as well as Spanish), would use more mixed constructions, e.g. both impersonals predicated of a proposition (e.g. *il faut*) and modalities predicated on grammatical subjects, like *should*, *can* or *devoir*, *pouvoir*.

2.6 Developmental patterns

Since expression of propositional attitudes is closely dependent on factors of general social cognitive development, we expected to find similar developmental patterns across the four languages in the sample. However, the special status of modal auxiliaries in English, as a grammaticized subset of morphosyntactic

operators, might make them more accessible and hence more widely used than in the three other languages.

3. Scope of analysis

Propositional attitudes were examined in the expository and narrative texts written in three languages — English, French, and Hebrew — supplemented by examples from Spanish data. Texts were analysed for 20 subjects in each of three age groups: grade-schoolers (G), high-school students (H), and adult university students (A), yielding a total of 60 texts in each of three languages. Detailed analysis was confined to expression of two broad dimensions of modality (§3.1), analyzed in relation to referential scope and to the type of subject nominal with which they were associated (§3.2).

3.1 Dimensions of modality

We selected for analysis propositional attitudes that could be ranged along two broad dimensions, one more clearly deontic and the second more clearly epistemic:

(3) Dimensions of semantic analysis:

Deontic: Obligation/Necessity + Prohibition/Permission

Epistemic: (Im)possibility/(In)ability + (Im)probability

The reason for this deliberate restriction in the scope of our analysis was in part practical: in order to limit the range of variables, given the complexity of a study with Age, Genre, and Language as its independent variables. In terms of coding procedures, it was often difficult to decide whether a given usage should be interpreted as expressing a propositional attitude, or merely as serving a general discourse-marking or segmentational function, e.g. in clauses with "cognitive" verbs like *I think*, *I believe*, or French *je trouve*, *je pense*. Moreover, across the four languages we considered, we found that these two broad dimensions account for a considerable proportion of all expressions of Modality in our sample.

In principle, the two dimensions are highly distinct, and the subcategories in each can be identified as expressing either deontic or epistemic attitudes. Moreover, prototypical forms of expressing these two dimensions (English *should*, *can* and their equivalents (French *il faut*, *pouvoir*; Spanish *tener que* / *deber* and *poder*; and Hebrew *tsarix*, *efshar*) emerge early in both first and

second language acquisition (Giacalone Ramat 1995); so they are well established in our youngest age group. In fact, Silva-Corvalán (1995:67) assigns *poder* and *deber* a special status in Spanish, pointing out that, syntactically, these two verbs (along with *osar* 'dare' and *soler* 'do customarily', neither of which is relevant to the present study) differ from other verbs like *querer* 'want' and *saber* 'know' which are sometimes also treated as "modal verbs", in that "they share the requirement to occur exclusively in construction with an equivalent subject ... [and] semantically, *poder* and *deber* stand apart as the only modals that can make a statement ... about the possibility of [the proposition] *p*."

Both our sets of terms are polysemous, and may express either deontic or epistemic attitudes. For example, English *should* ranges from mild advisability to strong necessity; *can* and *may*, along with their equivalents in the other languages, express both permission and possibility (Silva-Corvalán 1995). As illustrated in our endnote 4 (by examples with French *devoir*), the same terms may serve to express both deontic and epistemic types of modality — so that *must*, like *devoir*, can express either obligation, or an inference about the truth of a state of affairs. A further argument favoring restriction to these two broad dimensions is that each one has a rich range of forms that can be used to express the same general modulation of meaning. For example, for expressing obligation or necessity, English can use the modals and semi-modals *should*, *must*, *have to*, *need to*, *ought to*; French has *falloir*, *devoir*, *être obligé*; and Hebrew has *tsarix*, *xayav*, *muxrax*. Finally, in cross-linguistic terms, the languages considered differ in the syntactic constructions which they favor for expressing these dimensions of modality. English relies very largely on the special morphosyntactic system of modals, as a highly grammaticized, closed class of auxiliaries; but French is more mixed, in that it uses the impersonal *il faut* as a favored device for expressing obligation, as compared with the subject-directed modal verb *pouvoir* for possibility. Spanish too has not only impersonal expressions of obligation like *hay que*, but also the modal verbs *deber* (or *tener que*) and *poder*. Hebrew tends to rely very largely on impersonal constructions with *tsarix* 'must, have to', *asur* 'be prohibited, not be allowed', and *efshar* 'be possible' followed by infinitival or 'that' clauses.²

As a result of our focus on two specific dimensions of modality, we excluded from consideration the following dimensions, all of which can in some sense be said to express "propositional attitudes":

- a. State of knowledge, belief, and degree of certainty, expressed by mental state verbs (*think*, *know*, *believe*);³ speech act verbs (*claim*, *deny*, *insist*);

hedging, lack of commitment to a belief, and/ or inferencing (*seem*, *appear*, *assume*, *presumably*).⁴

- b. Intentionality or Planning (*try*, *decide*, *mean*, *hope*, *expect*).
- c. Volitional (or Volitive) modalities (*want*, *wish*, *prefer*, *be better*, *be preferable*).
- d. Affective attitudes (*like*, *be fond of*, *dislike*, *hate*, *despise*).
- e. Evaluative attitudes (*it's not good*, *difficult*, *c'est bête*).

We also excluded all expressions of what is traditionally treated under the heading of *MOOD*—specifically imperative, conditional, and subjunctive clauses. We disregard these expressions of different kinds of *IRREALIS* contingencies, regardless of whether they are grammatically marked by specific verb inflection, as in French or Spanish, or merely by use of tense/aspect forms that serve other functions as well, as in English and Hebrew.

3.2 Referential scope: Classes of subject nominals

One means of distinguishing the intended meaning of a modal expression is to consider the subject nominal with which it is associated. The second facet of our analysis thus concerns the question of to whom, or to what, the propositional attitude refers — or, in syntactic terms, the grammatical subject construction with which a given modal expression occurs. Compare, for example, these two occurrences of *could*:

- (4) a. She [=the bride] said my boyfriend could come for dessert and dancing. [Ea04fnw]
- b. If people with a conflict or problem would try and consider the other person's point of view, perspective, and reason for being at the opposite side of the problem as them, then maybe a resolution to the problem could be easily reached. [Ea01mew]

In 4a, the modal *could* has the sense of *PERMISSION* and is predicated of a specific person (the narrator's boyfriend) who was being allowed by another specific person (the bride) to attend her wedding. This is a typical example of what is sometimes called "root" modality — often, though not necessarily, identified with what we have termed "deontic" modality" (Coates 1995), and in other cases "subject-oriented" (Palmer 1985:103).⁵ Following Heine 1995, we adopt the term "Agent-oriented", by which the modal refers to a *SPECIFIC* entity (e.g. *my boyfriend*), and that entity is potentially an agent — in this case, of the act of coming for dessert and dancing. It is no coincidence, as we hope to show

our analysis, that this use of the modal *could* occurs in the NARRATIVE text of woman telling about the conflict involving herself, a friend who was getting married, and the narrator's boyfriend. In contrast, as used in the EXPOSITORY, the same modal *could* expresses POSSIBILITY, predicated of the abstract nominal *a resolution to the problem* — which, moreover, has the thematic role PATIENT, since the modal is embedded in a passive construction. Example 4a could be paraphrased as *She allowed my boyfriend* (= *gave my boyfriend permission*) *to come*, while 4b is paraphrasable as having a generic referent, *People/We/One could reach a solution*; or it could be couched in Impersonal terms, *would be possible to reach a solution*. Similar contrasts are revealed by the following comparison:

- (5) a. *I should clarify that I interpret conflict to be a negative term.* [Ea02mnwa]
 b. *Addressing some conflicts may put an individual in danger and should simply be handled by shrugging it off and/or walking away.* [Ea04fewa]

Again in 5a, the “agent-oriented, specific reference” of the modal *should* occurs in the context of a narrative text; the man producing it is making a “sidestep” metacognitive comment concerning how he, the writer, interprets the topic of the text he is in the process of writing — referring to himself in first person. Here *should* has the sense of OBLIGATION; the writer feels that it is incumbent upon him to clarify his attitude to the topic at hand. In 5b, the modal *should* also expresses obligation, necessity, or desirability; so, in principle, it lies on the “deontic” side of the modality scale. But in contrast to 5a, it has an abstract, nominalized PATIENT subject in a passive construction: *Addressing some conflicts should be handled by ...* As in 4b, this could be paraphrased either by generic reference to a non-specific universe of humans, *People/We should simply handle the problem by ...*, or by an impersonal construction, *It is necessary to handle the conflicts by ...*

As a further instance of the interaction between the use and interpretation of modal predicates and their associated nominal subjects, consider the different uses of *let* and *allow* in the following.⁶

- (6) a. *Now I do not let anyone use those terms, but I tend to solve problems verbally as opposed to physically.* [Eh12mnw]
 b. *I don't believe the experience was anything more than his rage and my unwillingness to let it affect all of the people around him.* [Eh05fnw]
 c. *Some solutions on how to avoid these conflicts would be to express your views in a non-aggressive manner and not allow your ignorance to get in the way of seeing the other person's side. By confronting the person*

non-aggressively, you are allowing yourself to stay calm and clearheaded. [Eh13few]

- d. *Language ... not only allows us to preserve knowledge, but it allows us through commonly understood symbols to reduce unnecessary conflict.* [Ea0mew]

Examples 6a–b are the concluding lines (in fact, the codas) to narratives written by an English-speaking high-school boy and girl, respectively. In 6a, the verb *let* is used with the basic sense of *allow, permit, give permission to* (corresponding to French *laisser, permettre*; Spanish *dejar, permitir*; Hebrew *latet* lit. ‘to give’, *leharshot*). Relatedly, it is agent-oriented, and it makes specific reference to the narrator/protagonist as surface subject, writing his story in the 1st person. In 6b, although the same verb occurs with an abstract derived nominal *unwillingness* as subject, it can still be interpreted as having specific reference to the 1st person narrator, and can be paraphrased as *I was not willing to allow it to affect the people around him*. In contrast, the possessive pronoun in 6c, unlike *my* in 6b, does not refer to deictic *you* as a specific addressee; rather, it expresses generic 2nd person, in the sense of *You (= one) should not allow ignorance to ...* The combination of a generic subject with an abstract derived nominal as object yields an interpretation not of permission, but of ENABLEMENT: *You should not make it possible for ignorance to get in the way ...* This sense is even more marked in the adult's use of *allow* in the expository text of 6d: Here no paraphrase is possible with *permit*; rather, this man is saying that language *makes it possible* for us to ... preserve knowledge, and it also *enables* us to reduce conflict.

Examples 4–6 demonstrate that interpretation of a modal expression — and deciding whether it in fact expresses a propositional attitude — depend critically on the subject of the clause in which it occurs. Accordingly, as part of our analysis, we examined the distribution of grammatical subjects in clauses expressing the dimensions of modality that we analysed. This yielded a scale of five classes of subjects, ranked from the most agent-oriented and specific (often in narratives, although not necessarily deictic) to the most abstract and propositional:

- (7) Classes of subjects occurring with modal predicates
- | | |
|------|--|
| {AG} | Agent-oriented, specific reference: e.g. <i>I, my girlfriend, his teacher</i> |
| {GN} | Generic: GNn = Refer to a general class of nouns (<i>people, kids, teachers</i>);
GNp = Generic pronoun (<i>one, we, you</i>) |
| {IM} | Impersonal: Expletive <i>it, there</i> ; French <i>il</i> ; Spanish, Hebrew \emptyset |
| {AB} | Abstract: <i>conflict, issues, resolution of problems, quarrels</i> |

- {PR} Propositional: referring to clause(s): *it, this*; French *ce, ça*; Hebrew *ze*

As these listings indicate, each language has a different range of devices for the three non-lexical, non-specifically referential categories. All four languages can use both 1PL (*we, nous, nosotros, anu/anaxnu*)⁷ and 2SG (*you, tu, tú, ata*) for non-specific, generic reference. Spanish and Hebrew differ from the other two languages, since they use subjectless constructions for making impersonal reference to propositional attitudes, where English and French require an expletive pronoun (as in *it is possible, il faut*). Another way of achieving non-agent orientation is use of modals in passive constructions, where the surface subject has patient status, as in 4b and 5b (cf. Keenan 1985, Budwig 1990). These constructions are most common in English, less so in French, and still less in Hebrew and Spanish. This reflects the generally wider reliance on passive voice in English and French, and the fact that Hebrew and Spanish have a range of other rhetorical options for downgrading agency (Jisa et al. 2002).

3.3 Forms: Lexico-grammatical encodings

We considered four classes of linguistic forms as possible means of encoding the functional dimensions in question:

- a. *Modal auxiliaries*: Modal or semi-modal terms that are obligatorily preverbal. In English, modals occur in morphologically defective paradigms and are followed by a base form of the verb (e.g. *can, must, should*), while the semantically corresponding semi-modals are followed by the infinitive (e.g., *be able to, have to, ought to*). A few of these terms are grammatically mixed in this respect, with variation between dialects of English, e.g. *need, ought*.
- b. *Modal predicates/operators*: Terms which include (i) verbs expressing modality that are followed by a same-subject infinitival complement in SVO constructions (e.g. English *need to*; French *devoir, pouvoir*; Spanish *poder, deber*; Hebrew *tsarix, yaxol*); and (ii) expressions that occur in impersonal constructions, and are followed by a complement clause on which the modality is predicated, e.g., French *il faut*, Spanish *hay que*, Hebrew *efshar* '(it is) possible'.
- c. *Predicating adjectives*: Terms such as *possible, likely, necessary* and their counterparts in other languages — used in their predicative, but not their attributive function, e.g. *it is possible to/that...*, but not *a possible/likely candidate*.

- d. *Adverbials*: Expressions that modify the proposition with respect to the relevant dimensions of modality, e.g., *perhaps, possibly, necessarily, probably*.

Where a marker of modality governs several (typically non-finite) clauses, each successive clause in the "stacking" is counted, but it is marked as "+GAP". Propositions that contain two or more expressions of modality are coded as "double-marked":

- (8) a. *People can get hurt being lazy. Maybe they can help out more.* [Eg19ew]
 b. *An open mind and a desire to think the situation through rationally might possibly have prevented the confrontation from occurring in the first place.* [Eh18mew]
 c. *Il faudrait peut être en parler moins et [GAP] faire plus.* [Fh03mew]

We disregard English *will, would* when they are used to express Future Tense rather than Modality, or in the consequence clause to a conditional. That is, we treat these grammatical "modals" on a par with the inflected forms of the future tense in the three other languages. This decision was also applied to Hebrew — even though in this language, because of its impoverished system for grammatical marking of aspect and mood (especially compared with the other languages in this sample), future forms are used for a range of irrealis functions, including conditional, subjunctive, and hortative (Berman & Neeman 1994). We have also disregarded, as noted, the use of the imperative mood for expressing injunctions and prohibitions, even though these notions interact intimately with the propositional attitudes under study here. In English, these take the base form of the verb (preceded by *do not* or *don't* in the negative), as in the following example from a grade-schooler:

- (9) *If you have a problem, go to a parent a teacher or another person you know. If something is wrong, do not get in a fight, tell a grown-up.* [Eg09mew]

Across the English texts, even among the younger children, there were very few examples of such imperatives, occurring here in the consequent clause to a conditional. In contrast, the Spanish and Hebrew samples — particularly, but not only, among the grade-school children — make wider use of infinitives to express injunctions and prohibitions, in something akin to imperative mood (even though both these languages have grammatically inflected imperative forms, unlike English):

- (10) a. *Como por ejemplo no echar papeles al suelo, no discutir entre ellos, y por supuesto no pelearse por nada, y no matar a nadie y no charlar, y*

estudiar mucho y atender a los profesores ... y todos aprendían qué era la amistad... y ayudarse y pensar bien de sus compañeros.

'Like for example not to throw [= don't throw / you shouldn't throw] papers on the floor, not to argue among yourselves, and of course not to fight with one another for anything (at all), and not to bother anybody and not to gossip, and to study hard and to listen to the teachers ... and everyone will learn what friendship is ... and to help one another and to think well of your classmates.' [Pg04few]

- b. *La película va sobre el comportamiento en el colegio de los niños, de no hacer chuleta, no pelearse entre ellos, no tirar el teléfono, ni romperlo, no poner los cuernos en una foto, devolver el dinero a la profesora.*

'The film is about the behavior in a school for kids, to not have fights, not to quarrel with one another, not to pull the telephone, not to break it, not to make horns in a photo, to return the money to the teacher.' [Pg16mew]

Similar chainings of infinitives are used to encode injunctions and prohibitions in the Hebrew texts written by two 9-year-old girls:

- (11) a. *she-asur la-morim lits'ok al yeladim, asur la-morim leharbits la-yeladim. loh latet la-yeladim leha'atik mivxan le mivxan, lehityaxes el kulam, ve loh rak le-kama yeladim ve-le kama loh.*
'That (is) forbidden to-teachers to-shout at kids, (is) forbidden to-teachers to-hit kids. Not to-let kids to-copy from one test to another, to relate to everyone, and not only to some kids and to some not.' [Hg11few]
- b. *ma tsarix la'asot kedey loh lehagia le-makot ve-klalot: loh leha'atik, loh lignov mashehu shel mishehu axer ve dvarim kaele.*
'What must to-do [=what should one do] in-order not to-get to beatings and curses: Not to copy, not to steal something from somebody else and things like that.' [Hg12few]

These "bare infinitives" — i.e. infinitives used alone in a clause, with no preceding, tense-marked modal operator of some kind — express propositional attitudes that are closely akin to the topic of this paper. However, in order to facilitate cross-linguistic comparisons, we decided to confine analysis to clauses which contain overt LEXICAL marking of such attitudes (e.g. *asur* 'forbidden' in 11a, and *tsarix* 'must' in 11b) — except, as noted, in cases of syntactic gapping.

4. Data analysis and interpretation

As noted above, the original motivation for studying propositional attitudes in our sample was the observation that the youngest group of children, when asked to give a talk and write an essay discussing the topic of "problems between people", tended to express highly judgemental and prescriptive attitudes to the theme of interpersonal conflict. As shown by Tolchinsky et al. 2002, grade-schoolers tended to interpret the topic in thematic terms closely related to the contents of the video they were shown at the outset. Across different languages, children in this Age group appeared quite similar to each other (and distinct from the older age groups) in the moralizing tone they adopt. The fact that this is not an idiosyncratic, individual phenomenon is shown in the following expository texts written by four different English-speaking grade-school children. Each text represents a different order of task presentation; thus 12a, the written exposition, was the first of four texts produced, 12b was the second, 12c the third, and 12d the fourth.

- (12) a. *I do not think fighting is good. You do not make friends that way. If you do not fight, you can have many many friends. But when you fight, you can hurt the person's feelings you are fighting with. You should always be nice and respectful to other people, and if you are not nice, you will end up not having any friends. That is why you should not fight.*⁸ [E16few]
- b. *Some things you should not do are cheat and do drugs. If you cheat, you will get in trouble, you will also not learn anything. The reason you should not do drugs are because they can kill you. They will also make you dumb.* [Eg12few]
- c. *If you have a problem, go to a parent a teacher or another person you know. If something is wrong, do not get in a fight. Tell a grownup.* [Eg09mew]
- d. *If you see someone in a conflict, then you should not get into them. You should tell an adult and use that as a lesson to not get into conflicts like those. You should also never get into conflicts yourself. If you were to find money that you know whose it is, then you should give it to them and not keep it, otherwise you will feel guilty and get yourself into a conflict.* [Eg01few]

These texts are not peculiar to English-speaking Californian 4th-graders. The same general attitudes are expressed by children from France, Spain, and Israel:

- (13) a. *C'est bête de se battre pour une chose ou pour une autre. Le plus intelligent c'est celui qui arrête le premier. Quand on se fait racketter, c'est une exception. Il faut s'éloigner le plus possible de la personne. Quand on refuse la paix, c'est qu'on a envie de se battre. Les bagarres peuvent commencer à partir de très peu. Il faut toujours et toujours pardonner.* [Fg01mew = the 4th of 4 texts]
 'It's stupid to fight for one thing or another. The smartest is the one that stops first. When someone gets extorted, that's an exception. It is necessary [= one should] keep as far from that person as possible. When someone refuses to make peace, it's because they want to fight. Quarrels can start from very little. It is necessary [=one should] always always forgive.' [Fg01mew = the 4th of 4 texts]
- b. *No es bien lo que hay en el video porque hay muchos niños que se fijan de los demás y tienen que mejorar su actitud porque está mal insultar a la gente que no te ha hecho nada, no te ha pegado* [Pg07few]
 'It's not good what is in the video because there are lots of kids that notice others and must that [they should] improve their attitude because it is bad to insult people that haven't done anything to you, that haven't hit you.' [Pg07few]
- c. *lefi da'ati alimut ze ha-davar haxi nora she-yesh, she-ravim kol hazman, ve she- marbitsim ve tso'akim ve xadome. Kol yom roim be-beyt hasefer beayot she-marbitsim ve mekalelim ve kol miney dvarim she-lefi da'ati xayavim lehipasek. Im anaxnu rotsim xayim tovim yoter, anaxnu xayavim lehafsik et ha-alimut hazot bimhera ...*
 'In my opinion violence is the worst thing there is, that (people) fight all the time, and hit and yell and so on. Every day (you) see at school problems that (kids) hit and curse and all kinds of things that in my opinion must stop. If we want a better life, we have to stop this violence right away...' [Hg13few]

These texts illustrate a shared, quite general DISCOURSE STANCE; this term, as discussed by Berman et al. 2002, refers to "the speaker/writer's general attitude towards the topic under discussion". Examples 12–13 rely on a range of linguistic forms of expression; but the propositional attitudes which they encode tend, all together, to give voice to a similarly prescriptive and judgemental perspective on the over-all topic of interpersonal conflict. Within this broad frame of an over-all discourse stance, the analyses which follow focus on two major classes of propositional attitudes, as expressed in the expository and narrative texts written in English, French, and Hebrew. (Note is made where

these are supplemented by findings from Spanish-language texts.) Texts were analysed for 20 subjects in each of three Age groups: grade-schoolers, high-school students, and adult university students, yielding a total of 60 texts in each of three languages. The variables considered are Genre (expository vs. narrative, §4.1), Age (§4.2), Language (§4.3); each of these is then reviewed with respect to referential scope of the propositional attitudes that were identified (§4.4).

4.1 Comparisons by Genre: Exposition vs. narrative

Expression of propositional attitudes, as defined and analysed in the present context, proved to be a criterial indicator of inter-Genre distinctions. Across Age and Language, expression of propositional attitudes was confined largely to the EXPOSITORY texts. The narratives included very few examples of modal expressions, calculated as proportion of clauses which contained at least one lexical encoding of the relevant modalities. As shown in Figure 1, these ranged from an average of some 3% of all clauses, in the narratives written by English-, French-, and Hebrew-speaking school-children (with the same low range from 1% to 4.5% in both the grade-school and high-school populations) to 7.5% of the adults (from 5.7% to 9.4% in the three languages). The main development evident in this respect was the number of subjects who used at least one such expression in their narratives, from a very low average of 3 out of 20 subjects at grade school, to 9 out of 20 at high school, and to 16 out of 20 among adults.

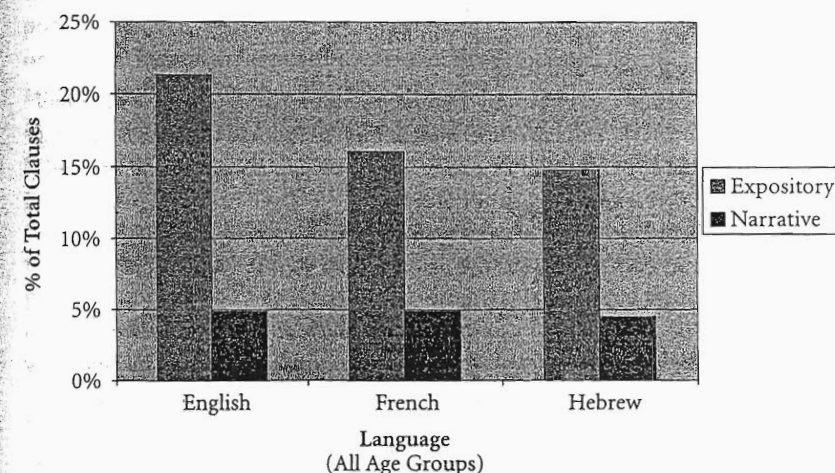


Figure 1. Clauses containing modal expressions

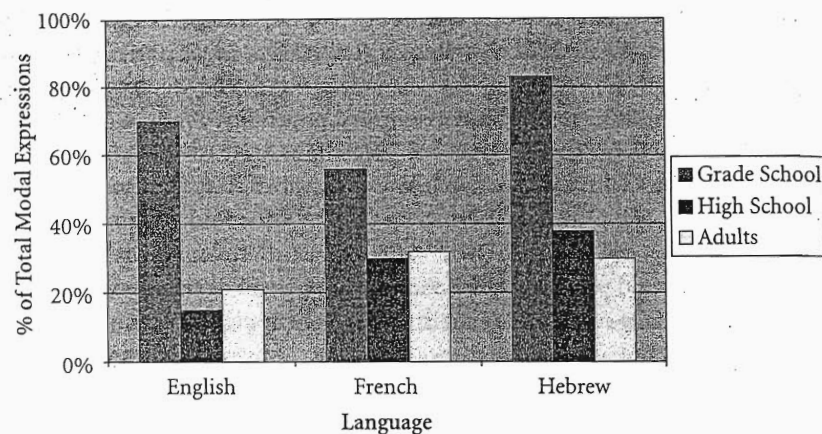


Figure 2. Expository writing: Deontic modal expressions

contrast, high-schoolers and adults relate to topics of social relevance from a more reasoned, cognitively anchored or objective point of view, taking into account possible causes and consequences of such states of affairs.

A major cut-off point in this respect emerges, as noted, between grade-schoolers in young childhood and high-school adolescents. This is clearly consistent with Piagetian and neo-Piagetian characterizations of cognitive and moral development (see Hersh et al. 1979; and see also references to this general developmental trend, and discussion of it in relation to “discourse stance”, in Berman et al. 2002, §5.9). It almost exactly mirrors the stages of moral development articulated by Kohlberg (cf. Power et al. 1989:9–10), where our younger subjects are still at the Level I or “pre-conventional” phase of “avoiding breaking rules”, when “reasons for doing right” are defined as “avoidance of punishment and superior power of authorities.” These are exactly the attitudes expressed by a variety of children in our sample, regardless of their native language (as illustrated by the grade-school texts in examples (9–11)). In contrast, the adolescents in our population have typically progressed to a maturely principled level of socio-cognitive and moral development, of “being aware that people hold a variety of values and opinions, that most values and opinions are relative to your group”. This characterization is also illustrated clearly by the text of an Israeli high-school girl given in example 2. The following text from a Californian high-school boy also reflects this stance.

- (15) *The primary cause for problems and conflicts between individuals today would stem from the lack of communication between people of varying viewpoints. Everyone is unique in their own way. Thus it comes as no surprise that people would have differing opinions on a variety of issues. The problem arises when we decide not to observe the other person's opinion with an open mind. Conflict arises out of someone not willing to listen to what the other has to say, as shown in the video during the scene in which the two boys fought. An unwillingness to listen can often escalate to both verbal and even physical aggression. An open mind and a desire to think the situation through rationally might possibly have prevented the confrontation from occurring in the first place. Therefore confrontation from conflict stems from a lack of communication and the unwillingness to analyze a different viewpoint. If we humans approached a situation more objectively without all our preconceived notions, then the world would experience far fewer conflicts.* [Eh18mew]

This text gives overt lexical expression to the propositional attitudes focused on in this analysis in only two instances — those signaled by underlining. Nonetheless, it clearly demonstrates the relevance of this type of analysis to the more general domain of socio-cognitive and moral development.

Although we have identified a major cut-off point between grade-school and adolescence, the texts of the adults also differ from those of the high-schoolers in three respects. First, although by and large adolescents and adults express epistemic rather than deontic attitudes to much the same extent, only adults relate to the semantic dimensions of probability (as in English *it is likely that*, Hebrew *yitaxen*) and of enablement (as illustrated in 6d, to the effect that “language allows us to do certain things”).⁹

Second, while high-schoolers use a broader range of modal expressions than grade-schoolers (e.g. not only English *should*, but also *must* and *need to*), it is mainly among the university-graduate adults that one finds a really rich and varied range of linguistic encoding of propositional attitudes. This is illustrated by the following examples from English and Hebrew adult texts.

- (16) a. *Whether in the political, career, or interpersonal realm, discussions must be managed carefully in order to avoid the appearance of condescending or belittling judgement. Even with groups with significant differences in viewpoint ... a polite civil discussion is key. This is a difficult goal, but is absolutely essential in preventing misunderstanding, conflict, and communication breakdown.* [Ea05mew]

- b. *Open and thoughtful communication has the potential to reveal each person's needs and desires to those with whom he or she interacts.* [Ea07mew]
- c. *It is exhilarating to imagine a world devoid of class conflict, to picture a world in which the majority of the major problems did not fester. This ideal is not utopian, it is something concrete with the possibility of coming into fruition.* [Ea08few]
- d. *ha-dereẖ letafked be-matsav shel konflikt nitenet le-limud. yesh mispar draxim efshariyot lifor beayot.*
 'The way to function in a situation of conflict given to-learning [= is susceptible to study = can be learned]. Be [= there are] several possible ways to solve problems [= problems can be solved in several ways].' [Ha03few]

Only the adults in our sample make use of these kinds of predicating adjectives and nominalizations to express ideas that can also be encoded by the modal auxiliaries *should*, *can*, *might*. We found such formulations among the adults, but hardly at all before that, in each of our languages; and the examples occurred not only in expository texts, as in 16, but also in narratives, as in 17.

- (17) a. *Essentially we had planned to spend three weeks together, but she felt it necessary to leave for home after only a few days.* [Ea07mnw]
- b. *It was my argument ... that the school had an obligation to rigorously enforce its own policies as well as ensure its own reputation.* [Ea05fnw]

Third, only adults embed propositional attitudes in metalinguistic commentary — often in the context of mentalistic verbs — in a way that differs from anything one finds among school-children:

- (18) a. *I should clarify that I interpret conflict to be a negative term ... I cannot believe that there is a single person of at least school age that does not see alternatives to conflict.* [Ea02mew]
- b. *En ce qui concerne l'exclusion, j'ai pu remarquer qu'elle est très présente à tous les niveaux scolaires.*
 'As far as ostracising is concerned, I could comment that it is very common at all levels of schooling.' [Fa03few]

The trends described in this section strongly support our prediction (§3.3) that, with Age, more linguistic forms will be recruited to meet earlier established functions in expressing propositional attitudes — and further, that a broader range of attitudes will find expression by means of linguistic forms established

earlier. Moreover, we interpret this reliance on an expanded range of formal devices as indicating more than just the availability of a larger repertoire of advanced vocabulary, or of greater sensitivity to higher-register linguistic usages among the well-educated, very literate adults in our population. Rather, we suggest that they express a greater RHETORICAL FLEXIBILITY than can be found among even the more proficient high-school subjects in our sample, and that this in turn reflects more MULTIFACETED COGNITIVE PERSPECTIVES on the issues under discussion. This echoes earlier findings from the oral narratives of adults compared with children (Berman & Slobin 1994). Maturely proficient "thinking for writing" — to extend the idea proposed by Slobin 1991, 1996 on the relation between thinking and speaking — requires a combination of abilities: (a) the cognitive ability to adopt multiple perspectives on the situations that are verbalized; (b) linguistic command of an extensive repertoire of lexico-grammatical devices; and (c) rhetorical expressiveness, flexibility, and metalinguistic textual awareness in deploying these devices in extended discourse.¹⁰

4.3 Comparisons by language

As we had predicted, the usage of the youngest children clearly reflects the lexical forms and morpho-syntactic constructions favored by adult speaker/writers for expression of obligation and possibility in their language. Thus the word *should* abounds in the texts of the English-speaking grade-schoolers, followed by *can* and *could*; their French peers use mainly *il faut* 'It (is) necessary/desirable' (plus an occasional *devoir*) and *pouvoir* 'to be able'; Spanish grade-schoolers use either *tener que* or *hay que* 'must' for obligation,¹¹ and *poder* 'be able' almost exclusively for possibility; while Hebrew-speaking children rely almost entirely on two impersonal or "clause-external" modal predicators — *tsarix* '(it is) necessary to, it must be that' for obligation, and *efshar* 'possible' for possibility.¹²

What emerges, as a relevant cross-linguistic distinction, is the difference between what we call "clause-external" vs. "clause-internal" expressions of propositional attitudes. (These terms are intended to avoid the terminological controversies and problems of semantic interpretation noted in the introduction.) Clause-external forms precede a clause which is their syntactic complement (e.g. English *it is necessary to help*, *it is possible that someone knows*), while clause-internal forms come between a subject (if there is a surface subject) and before the verb (*we have to help*, *someone might know*). Among the languages in our sample, English favors clause-internal forms; but French and Spanish are

mixed, and Hebrew prefers "clause-external" modality, particularly in the context of expository discourse. These differences are evident from the youngest age, and it is only among high-schoolers, and especially among adults, that a range of other structural possibilities finds expression. Thus English-speaking adults use an occasional *it is possible*, *it may be necessary*, which are clearly high-register, and more marked than the ubiquitous *can* and *should*. French high-schoolers and adults also increasingly replace *il faut* by expressions like *être obligé*, *il me semble nécessaire*, *l'essentiel est de...*, and by the verb *devoir* for obligation; and they supplement the clause-internal use of *pouvoir* by employing it in passive constructions:

- (19) *tout conflit peut être évité* 'any conflict can be avoided' [Fa16few]

Hebrew-speaking high-schoolers and adults rely very heavily on "clause-external" expressions, but they use a much wider range of forms than the children:

- (20) *nitan livxor be-derex axeret* 'given = it is possible to-choose another path' [Ha03few]
 (21) *alexa lilmod levater lif'amim* '(it is incumbent) upon-you [= one] to learn to give in sometimes' [Ha01few]

These patterns are supplemented by clause-internal SVO constructions:

- (22) *ha-matsav mexayev hitnagshut* 'the situation obligates dissension' [Ha03few]
 (23) *ha-xaluka asuya lehakal* 'the division (is) likely to facilitate' [Ha04mew]

Cross-linguistically, the developmental shift we observe shows that, with Age, English speaker/writers move away from exclusive reliance on clause-internal modal auxiliaries for the expression of obligation and possibility. French subjects use a wider and rather different range of both clause-external and clause-internal forms than the children. Hebrew high-schoolers, and especially adults, abandon the exclusive use of clause-external forms (which they also vary lexically and semantically), and they include clause-internal forms inflected for agreement with a subject noun phrase. These trends are, we suggest, a result of other typological features of these languages, namely the status of "modal auxiliaries" and of impersonal constructions in the target language.

English alone, of the languages we examined, has a highly grammaticized, syntactically distinct class of modal auxiliaries, represented in our analysis primarily by *can*, *could*, *may*, *might*, *must*, and *should*. In morpho-syntactic terms, these do not directly parallel the corresponding expressions favored in the grade-school

texts of the other languages. We had predicted that the special status of modal auxiliaries in English, as a grammaticized subset of morpho-syntactic operators, might make them more accessible and hence more widely used than in the other languages. This was indeed what we found, markedly at grade-school age: English-speaking children express more of the propositional attitudes that we examined than children speaking the three other languages. Calculated as percentage of total clauses across the age-group, English-speaking children expressed some kind of relevant modality in almost one-quarter (24%) of the clauses in their written expository texts, compared with 13–16% in French, Spanish, and Hebrew. This can be explained by the relative SALIENCE of closed-class systems of items, which Talmy (2000:21) describes as "constituting the fundamental conceptual structuring system of language." It also reflects the psycholinguistically privileged status of grammaticized elements in development, as noted by Slobin 1997 — what he has called the "grammatically induced channeling of attention" (Berman & Slobin 1994:619). Like the case of grammatical aspect that Slobin considers, the relatively greater reference to propositional attitudes in the expository texts of English-speaking school-children can be attributed to the ready accessibility of "a rich repertoire of grammaticized notions [that] leads the child to explore the corresponding semantic/pragmatic domains" (1994:620).

The difference in the over-all amount of propositional attitudes given lexical expression in the expository texts by the English-speaking 9-year-olds compared with their peers in other languages, levels off by high-school age. The older Hebrew-speaking subjects differ in this respect from their English and French peers. All English high-school and adult subjects and nearly all French subjects (37/40=92.5%) use such expressions at least once in their expository texts. But among the Hebrew subjects, only 70% (28 out of 40) express these attitudes at least once in the essays they wrote about interpersonal conflict. This difference probably results from cross-cultural rather than linguistic factors. We note, very tentatively, that Israeli discourse has been characterized as relatively more "direct" than that of English-speaking Americans and Britishers as well as Germans (Blum-Kulka et al. 1989). Since modals typically serve as a means for hedging or lessening the commitment of speaker/writers to the contents of their statements or claims, Israelis might tend to formulate their statements more directly, as indicative propositions, rather than couching them in the more tentative terms of irrealis contingent possibilities.

4.4 Referential scope of propositional attitudes

Under this heading, as outlined in §2.2, we consider the semantics and pragmatics of how propositional attitudes are attributed to persons or entities, as encoded by the grammatical subject with which it is associated. In §3.2, we identified five types of subjects occurring with modal predicates, ranked from referentially specific, “agent-oriented” lexical noun or personal pronoun subjects to non-referential, non-specific, “propositional” subjects (like English *it*, *this* or French *ce*), whose scope of reference is an entire clause or sequence of clauses. Below we describe the breakdown of the different classes of modal referents.

Agent-oriented: Fully agent-oriented modality, predicated of a specific person, proved to be a clear differentiator between expository and narrative genres of discourse. In the expository texts in English, French, and Hebrew, obligations and abilities attributed to a volitional agent accounted for less than 5% of such modalities at all three Age groups. In contrast, these types of subjects occurred with modalized predicates on an average of two-thirds of the cases in the narrative texts, across the sample, in all three languages. This strong contrast is further evidence for the early emergence and clear linguistic marking of inter-genre distinctions across the languages in our sample (§4.1). There was also relatively less agentive orientation to propositional attitudes in the narrative texts as a function of Age (but recall that almost no grade-schoolers expressed propositional attitudes in their narratives). This lends support to the idea that mature texts are more divergent: Narrative-type incidents, making reference to specific individuals, were included in several expository texts; and expository-type passages, expressing attitudes to general states of affairs, occurred in the narratives of older, mainly adult speaker/writers.

Generic: Propositional attitudes interpreted as having generic reference typically referred to class nouns with human reference, most generally in the plural (see Berman et al. 2002, §3), e.g. *people*, *kids*, *teachers*, with some cases referring to institutions, e.g. *countries*, *schools*. These lexical expressions were counted together with generic pronouns (English *we*, *they*, *you*, *one*; French *on*, *nous*; Hebrew *anu* ‘we’, *ata* ‘you’) — since it was not always possible to draw a line between these two categories of generic reference (e.g. in *someone*, *anybody*). Thus the expository text written by an English-speaking adult includes several different types of generic subjects:

- (24) *No one can escape the reality. ...; one needs to be aware of. ...; people may be subjected to problems that. ...; one [= one person] may face a series of problems that ... others may face problems that ...* [Ea13few]

These texts contain rather less use of generic *you* as a non-personal pronoun:

- (25) *The more time you spend with a close friend, the more likely you are to become aggravated* [Ea06few].

The differences in distribution of this type of reference for propositional attitudes were mainly between English and the other two languages. In all three Age groups, French speakers used generic subjects in around 30% of the cases where they expressed obligation and possibility, and Hebrew subjects did so around 20% of the time. In contrast, English-speaking grade-schoolers used this kind of generic reference — both lexical, e.g. *people*, *kids*, and pronominal, e.g. *they*, *one* — with more than 80% of their uses of the modals *should* and *can*. But this percentage drops markedly with Age in English, since the high-schoolers and adults use generic subjects far less than the children (42% and 33% respectively of all relevant propositional attitudes).

Consider next the kind of subject reference that was preferred by French and Hebrew subjects from the youngest age group on, and by English-speakers from high-school age up.

Impersonals: Use of impersonal reference — as in English *it is necessary*, *there could be a need*, French *il faut*, *il me semble nécessaire*, and Hebrew subjectless impersonals with modal operators like *efshar*, *tsarix* — revealed an interaction between developmental and typological factors. English speakers avoid impersonal constructions almost entirely (only 5% to 7% of all their propositional attitudes in all three Age groups); French children rely extensively on the impersonal construction *il faut* (63% of all grade-school expressions of obligation or possibility), but this usage drops to only 20% with high-schoolers and adults. Hebrew speakers show yet another pattern: They use subjectless impersonal constructions 80% of the time at grade-school age, but this goes down to two-thirds at high school, and to less than 20% among the adults. That is, English speaker/writers make almost no use of impersonal constructions to express modality, while French subjects show a mixed pattern, and Hebrew subjects prefer them through high school.

We explain these cross-linguistic differences as follows. In English, the salience and accessibility of a rich system of closed-class items for expressing “clause-internal” propositional attitudes, noted in the preceding section, accounts for the avoidance of impersonals. In French, speakers move by high-school age into decreased use of clause-external impersonal constructions, abandoning the earlier *il faut* for expressions like generic 26, or abstract 27.

- (26) *les professeurs devront avertir les élèves ...* ‘teachers must warn their students’ [Fh05few]

- (27) *une nation qui a pour devise liberté, égalité, fraternité se doit de mettre tout en œuvre ...* 'a nation that has as its motto liberty, equality; fraternity, should ... (owes it to itself...)' [Fa07mew].

This shift reflects a developmental move away from the vague generalities typical of the expository texts of the younger children across our sample; this shift is marked, in high-school age, by relatively less reliance on such devices as generic *on* (Jisa & Viguié 1999, 2001) and impersonal *il faut*. Hebrew speakers continue, throughout high school, to rely heavily on their early acquired and readily available subjectless impersonal constructions, one subclass of which is allotted to what we have termed "clause-external" modal operators (Berman 1980, 1990). A shift away from extensive reliance on impersonals is manifested only in the adults — who, alone among the Hebrew speakers, make extensive use of clause-internal modals inflected to agree in number and gender with their surface subjects.

Abstract nominal reference: This category refers to expressions such as the following.

- (27) *conflict can be a good thing* [Eh04few]
 (28) *conflict resolution could be taught in our public schools* [Ea20few]
 (29) *tremendous amounts of time and patience need to be invested* [Ea06few]
 (30) *l'avis à propos du pompage peut être divisé*
 'opinions as concerns cheating might be divided' [Fh32mew]
 (31) *les autorités ou les instances chargées de régler ce problème devraient prendre en compte ...* 'the authorities or agencies charged with handling the problem must take into account ...' [Fa11few]

In the Hebrew adult texts, even heavier and more complexly derived nominals function as the subjects of propositional attitudes. Here differences are developmental rather than cross-linguistic. Abstract nominals account for 40–50% of the referents of propositional attitudes in the English- and French-speaking high-school students and adults, while Hebrew speakers make the shift from impersonal to abstract noun reference at a later stage (14% in high school as compared with 58% among adults). Relatedly, propositional attitudes relevant to entire propositions, referring back to statements made in preceding clauses, are found only among the adults, but they account for a very small proportion in the three languages. Across our sample, the ability to relate propositional attitudes to abstract situations, circumstances, and entire propositions emerges as a clear indicator of cognitive development in interaction with increased linguistic sophistication.

Finally, we calculated the proportion of the propositional attitudes that were embedded in passive voice constructions. These included constructions like English *needs to be handled, must be resolved* (see 1), or French *conflit peut être évité* 'conflict can (to) be avoided', Hebrew *ha-beaya yexola liyot metupelet* 'the-problem can to-be handled'. Such constructions perform the usual function of passives in downgrading agency and focusing on the patient undergoer (Keenan 1985). In the present context, they distance speaker/writers from the propositional attitude being expressed, freeing them from responsibility over the event predicated. Since nearly all these passive constructions are agentless, they are even less specific in reference than their active voice counterparts with impersonal or generic subjects (compare *conflicts should be resolved* vs. *people should resolve conflicts, the problem must be addressed* vs. *one must address the problem*).

Most such constructions occur in the adult texts, and they show a clear impact of target language typology: They account for up to 20% of all expressions of the relevant dimensions of propositional attitudes among the English adults, 9% of the French, and only 2% of the Hebrew. Rather than using passive voice, speakers of French, and especially of Hebrew, rely more on impersonal constructions for downgrading agency. This exactly reflects the differential degree of reliance on passive voice constructions in these languages, and the existence of other rhetorical options for achieving the same discourse functions (as delineated by Jisa et al. 2002).

5. Conclusions

The present paper reiterates certain key themes that have emerged across our study, as summed up by Berman & Verhoeven 2002. First, it underlines the early emergence of inter-genre distinctions noted there from a previously unexplored perspective. The marked quantitative distinction between expository and narrative texts in three different languages (with relatively little change across school-age, or from high-school to adulthood) in amount of linguistic encoding of the relevant propositional attitudes — as well as in the number of subjects expressing these attitudes — reveals that the domain of "modality and mood" can serve as a reliable criterial feature of non-narrative expository discourse. A second feature reiterated here is the shared developmental patterns evidenced in the expression of propositional attitudes across the three languages studied. These common developmental trends appear to outweigh the importance of target-language specifics in the lexico-grammatical forms of expression

available to speaker/writers in the different languages. However, interlanguage and within-group differences warrant further investigation to test the effect of cross-cultural variation, on the one hand, and individual differences on the other. Developmentally, a crucial cut-off point emerges with respect to the types of attitudes expressed by high-school adolescents and young adults, as compared with grade-school children. The 9–10 year-olds focus on deontically prescriptive attitudes, compared with the more mature reliance on epistemic attitudes. Interestingly, this mirrors developments noted across this project for a similar cut-off point in quite distinct domains, such as the differentiation between spoken and written language (noted markedly by Strömquist et al. 2002), types of subject nominals (Ravid et al. 2002), and text openings/closings (Tolchinsky et al. 2002). This suggests that it would be worth adding a fourth group of subjects to this analysis, the 12–13 year-old junior high-schoolers, on the assumption that they might constitute a bridge between the younger and older groups of children in our sample. Impressionistically, some pre-adolescents appear more like the younger children in this respect, and others more like the high-schoolers — suggesting that theirs might be a transitional stage.

Another major development was observed in the amount and quality of the linguistic forms of expression used in encoding propositional attitudes in this study. There is a clear age-related expansion in the range of forms used across the three Age groups we examined. The adults, in all three languages, use a far richer and more varied repertoire of modal expressions than any of the school-children. This reflects the general observation, across the articles in this collection, that more formal, higher-register language and deployment of an extended range of rhetorical options constitute the hallmark of standard, highly literate, educated usage, as exemplified by the adults in our study.

We hope to have shown that the lexical expression of propositional attitudes is a fruitful area for research into developing discourse abilities. The study reveals strong links between linguistic expression and general social cognitive development, which suggests that this domain merits further investigation. Possible extensions of the present study would be to examine the propositional attitudes expressed in conversational interchanges by even younger children, based on a semantic point of departure of the kind adopted in this study. Another direction for further research would be to extend the domain of this analysis to a full range of contingencies, hypothetical states of affairs, and irrealis modalities across the same data base. These might involve all types of future references, including conditional and subjunctive constructions, in cross-language and cross-modal perspectives, since the languages in our sample

differ interestingly in these respects. (French, Hebrew, and Spanish have inflected infinitives, but English does not; English, like other Germanic languages in our sample, uses a “modal” type of auxiliary for future tense; English, French, and Spanish, but only marginally Hebrew, have productive periphrastic forms of referring to the future — with *gonna*, *aller*, *ir* respectively — and these are likely to be more frequent in spoken than written texts.) Another, complementary extension would be to analyse the expression of affective and evaluative attitudes (*I don't like it when people fight*; *it's not nice to call people names*), in order to provide further insight into the relation between propositional attitudes and moral development from late childhood across adolescence to adulthood in different countries. The development from subjective, personally centered attitudes to more cognitively anchored viewpoints could be explored by examining dimensions of epistemic modality that refer to mental states of belief, knowledge, and inference.

In sum, the present study supports the assumption that the topic of propositional attitudes is an important source of insight into the general domain of developing discourse abilities. Our study differs from the articles that precede it in this collection since it takes semantic content, rather than lexical items or grammatical constructions, as its point of departure. Thus it should provide a useful bridge, connecting the former, more bottom-up or local analyses to more global perspectives on development of over-all text construction abilities, as presented in the next two articles.

Notes

* The authors are grateful to Liliana Tolchinsky for her contribution to conceptualization of the ideas presented here; and for assistance with the Spanish data. We thank Anita Zamora for her help with data analysis.

1. Subject ID's are specified by seven characters in square brackets, as follows:

- 1: Language (E = English, F = French, H = Hebrew, P = Spanish)
- 2: Age group (g = grade school, h = high school, a = adults)
- 3/4: Subject number (01 = the first subject interviewed in that age-group; 20 = the 20th subject)
- 5: Sex of subject (m = male, f = female)
- 6: Text type (e = expository, n = narrative)
- 7: Modality (w = written, s = spoken)

Thus [Eg05mew] = English-speaking, grade school, 5th subject, male, expository, written; [Fh09fnwb] = French-speaking, high school, 9th subject, female, narrative, written; [Ha12mewc] = Hebrew-speaking, adult, 12th subject, expository, written.

2. Our texts reveal these tendencies as clear rhetorical preferences, even though other alternatives are structurally available, e.g. English *it's possible, likely, necessary*. Conversely, note Hebrew "clause-internal" *yeladim tsrixim / yexolim la'azor* 'children must.PL / can.PL to.help' = 'have to / are able to'. See further the analysis in §4.

3. In French and Hebrew, the verb meaning 'find' (*trouver, limtso* respectively) is often used as corresponding to English 'I think'.

4. This means that we exclude use of modals like English *should, must*, excepting their deontic sense of obligation or necessity. Examples of such a semantic extension to a more marked, epistemic sense are provided by adults' use of the French modal verb *devoir* in the following examples, both from narrative texts:

Mes clés avaient dû tomber de ma poche

'My keys must have fallen from my pocket' [Fs02mnwa]

Je devais avoir quinze ou seize ans à cette époque là

'I must have been 15 or 16 years old at the time' [Fu35nwd]

Here the verb is used with the epistemic sense of deriving knowledge by inference (about the location of the keys, the narrator's age).

5. We avoid these terms in the present study, because of the different conventions and traditions of use associated with different schools of linguistic description — where "root" modality is sometimes defined semantically as contrasting with "epistemic" modality, and sometimes syntactically in terms of transitivity (Lyons 1977:792). Modality is sometimes predicated of an individual, as "x" in SxVO "clause-internal" constructions, or sometimes clause-externally, as predicated of a proposition (as "x" in the construction "(It) be x + Clause".

6. None of the younger children, in grade school (and also a sample of those we checked from junior high school, aged 12–13), used the verb *allow* in a single text; but adults typically distinguished *let*, for permission, vs. *allow*, for something closer to enablement.

7. Hebrew has two forms of the 1PL pronoun 'we': *anaxnu*, the everyday word (of Biblical origin) — used for personal deictic reference as well as impersonally, and is the only form in young children's usage — vs. the more formal and semantically restricted *anu* (of Mishnaic origin), used with non-deictic, textual generic reference to audiences and readers.

8. To facilitate reading, we standardize punctuation, spelling, and conventional divisions into sentences in reproducing these texts in the present context. These do not always reflect the original versions in format, punctuation, spelling, or text segmentation, nor the forms in which they were transcribed.

9. A Hebrew example is given by a woman who talks about the need for awareness of interpersonal problems, coupled with psychological and social assistance and educational effort — since this *yeafsher lexol exad me-itanu lemamesh et ha-potentsial ha-yetsirati ha-tamun bo* 'will-enable [=make it possible for] each one of us to realize the creative potential buried within him' [Ha02feway].

10. The different features characterizing maturely proficient expression of propositional attitudes, in a text written about interpersonal conflict, are reflected in the following excerpt from the expository text written by a Hebrew university student, a man majoring in graduate-level Humanities.

beayot beyn anashim 'Problems between people'

be-duni be nose ze, avakesh txila liftoax be-xaluka gam im melaxutit asher ta'azor li lehavhiro. 'In discussing this topic, I wish to commence with a division, even though artificial, which will help me to clarify it.'

alef — beayot inherentiyyot beyn anashim, bet — beayot mekomiyot o zmaniyot asher ha-zman ve ha-makom yotsrim, gimel — xilukey deot ve ha-akafot ha-nitanim le-yishuv be- hidabrut ve hakara.

'First — inherent problems between people, second — local or temporary problems which the time and place create, third — differences of opinion and points of view that given to-settlement [= that can be settled] by means of dialogue and consciousness.'

domani ki shloshet ha-nos'im otam hizkarti mala mexasim lefaxot et rov panav shel nose klali ke- "beayot beyn anashim."

'(It) appears to me that all three topics I mentioned above cover at least most of the facets of the general topic as "problems between people".'

ha-xaluka, lamrot heyota melaxutti, meafsheret lehakel ba diyun.

'This division, despite its being artificial, enables [= makes it possible] to facilitate the discussion.'

birtsoni lefareit kol nose ve nose be-nifrad. [Ha04mew]

'In-my-wish [= I would like] to detail each particular topic in turn.'

11. This is complemented by use of forms like *deber, necesitar* among high-school students.

12. These two "modal operators" are typically non-inflected and occur in these two basic forms in 3sg masculine present tense. They can also be inflected; compare (a) with (b), and (c) with (d).

- (a) *tsarix le-hafsik et ha-alimut*
'must to-stop ACC violence = people / one has to stop violence'
- (b) *ha-alimut tsarixa le-hipasek*
'Violence(FEM) must.FEM to.stop'
- (c) *(iy) efshar lehafsik et ha-alimut*
'(It is) (im)possible to stop violence'
- (d) *ha-alimut hi bilti efsharit*
'Violence(FEM) is (im)possible:FEM'

Hebrew also has clause-internal modal verbs that are inflected for number, gender, and tense:

- (e) *anashim xayavim la'azor* 'people must.PL to.help'
- (f) *anashim yaxlu la'azor* 'people could.PL to.help'

These are used occasionally by the high-schoolers, but more often by adults for expressing obligation and possibility in the expository texts we collected.

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BOOK REVIEW

John E. Ingulsrud & Kate Allen, *Learning to read in China: Sociolinguistic perspectives on the acquisition of literacy*. New York: The Edwin Mellen Press. 1999.

Reviewed by Lisa E. Husmann

Our four-year-old son returned home from his Hong Kong preschool with a new workbook in his school bag. Entitled 我爱普通话 'I love Putonghua', the book begins with a lesson on "What is a 中国人 (Chinese person)." For lesson one, the mostly native-Cantonese-speaking preschool students are expected to memorize in Standard Mandarin Chinese (Putonghua) the following verse:

我是中国人，要学普通话

'I am Chinese, I will learn Putonghua'

一句听不懂，处处闹笑话

'If I don't understand a single sentence, I'll make mistakes everywhere'

学会普通话，天下是一家

'By learning Putonghua, everyone (literally, "all under heaven") will be one big family'

The ideal of unity through language is learned early on in China, and has a long and prevalent history in Chinese society. The teaching of Putonghua to achieve that end (unity) in modern China is one of the central themes in the book under review. More generally, the book is meant as a case study of how the process of becoming literate in any society involves the concurrent learning of cultural and social norms, as well as the indoctrination into a country's political ideologies.

The book is divided into seven chapters. Chapter 1 provides a background on the status of language and language learning in the People's Republic of China. This chapter is particularly strong in its succinct description of the long and complex history of standardization attempts for Chinese. While focusing on modern developments, the authors do note that for Chinese characters the first standardizations were enacted over two millennia ago under Qin Shihuang, the first emperor over what has since been idealized as a "unified" China. (The authors might well have noted here some of the other drastic unification

measures applied by Qin Shihuang at that time, including standardized axle widths for carts and carriages, defined equivalents for weights and currency, and the systematic burning of all historical records of a pre-unified China). Providing insights on political influences in its development, the authors lead us through decades of language policy change to the introduction in 1956–1958 of a fixed set of simplified characters, a standardized spoken language (Putonghua, or “common language”) and a systematic phonetic alphabet to represent it (the Hanyu Pinyin, or “spell-sound” system).

The day to day learning of Putonghua through Pinyin is the subject of the bulk of the book. From Chapter 2, where we learn about the school setting where the authors’ study is done, Chapters 3–5 take us directly into the classroom to observe first-hand the educational process whereby Putonghua is learned through the medium of the Hanyu Pinyin Roman letter alphabet. Although dry at times, (we too must sit through the learning of initials and finals, a total of 63 syllables in the Pinyin alphabet), the authors do succeed in bringing the experience of the primary school classroom directly to the reader. Like the students, we too are gradually indoctrinated into opinions of what sounds “good” (Putonghua pronunciation) over “bad” (the local pronunciation we learned at home). Like fellow students in Hong Kong, we are taught to “love Putonghua,” learning from our teachers and sharing with our classmates the benefits of mastering Putonghua and Pinyin.

To the question “Why learn Pinyin?” students’ answers are surprisingly insightful. The response 可以认字 (‘can recognize words’, i.e. the ability to read Chinese characters) reflects a primary official goal of Pinyin: to increase literacy rates by making the learning of characters easier through the aid of phonetic representation. With seeming sophistication for six-year-olds, the students also list as Pinyin’s advantages the learning of foreign languages (学外国字) and opportunities to leave the country (可以出国). Such responses touch on the role of Pinyin in China’s increasing globalization, some aspects of which are discussed by the authors. For example, the debate over the effects of Pinyin in learning foreign languages (specifically, Roman-alphabet based languages such as English) is discussed sporadically, as is the argument against Pinyin as being “un-Chinese.” However, while the authors describe the differences in phonetic orthographies used in Taiwan (Zhuyin Fuhao) versus the mainland (Pinyin), they fail to address a current political storm of Taiwanese nationalism that is recently focused on this difference. In support of the Taiwan Minister of Education’s highly controversial position in favor of adopting Pinyin, a strong

statement was recently issued and signed by four of Taiwan’s Academia Sinica academicians (see Cheng, Ting, Wang, & Mei 2001).

In the final chapters, the authors discuss their findings in the context of what it means to become literate, in China specifically, as well as in the context of global literacy. This would have been an excellent place for the authors to provide us with a comparison of literacy rates in China before and after the introduction of Pinyin and simplified characters. While we are given piecemeal data — literacy estimates from early Chinese society (p. 130–131), from the latter half of the 19th century (p. 44), and from the 1990s (p. 140), the reader is still left wondering to what extent the goals of the 1950s drastic language reforms have been realized. A simple table would have done the job. Similarly, it would have been interesting to compare the mainland situation to Hong Kong, where the solutions to low literacy rates (Pinyin and simplified characters) were never introduced. In Hong Kong, children still learn the pronunciation of Chinese characters the “old fashioned” way — with no phonetic guide. What are the implications of this difference — in the learning process, in changes in literacy rates, in the pursuit of Chinese unity?

After six weeks of learning Pinyin, the first-graders under study begin learning Chinese characters. As a repertoire of characters is gradually built-up, the use of Pinyin in the classroom is phased-out. Whether Pinyin was ever considered as a replacement for Chinese characters, or instead was always seen merely as a precursory step to character literacy seems to be a matter of controversy. According to Feng & Yin (2000: 230), Mao Zedong’s original intention was for “the Chinese writing system ... to converge into the universal Pinyin approach.” According to this view, the official change in policy subordinating the status of Pinyin to an “auxiliary tool to Hanzi (Chinese characters)” did not come about until China’s National Conference on Language Works in 1986. This view is in contrast to most others’ writings on the topic, including the present authors, who supply a 1958 quote from Zhou Enlai in which he ensures that the intention of Pinyin “is not to substitute a phonetic writing system for Chinese characters” (p. 38).

On this same topic and also in the context of global literacy, the authors miss an opportunity to address the important current debate over Pinyin and the need for a more computer-friendly way to communicate Chinese in the world of international business. According to the authors, “the problem with the (Pinyin) script is that it lacks practical use” (p. 142). However, there seems to be mounting evidence to the contrary. In fact, a recent *New York Times* article examines the growing popularity of writing Chinese on computer, in

which Pinyin is used to access and enter Chinese character text (Lee 2001). Just as the convenience of the pen was seen as a cultural threat when it largely replaced brush writing after the turn of the 20th century, so today is computer use feared to be eroding Chinese handwriting skills. Long-term computer users interviewed in the article admit to have largely forgotten how to write Chinese characters, relying now instead on their knowledge of Pinyin spelling to retrieve characters from Chinese word processing programs. Some argue this as a threat to China's cultural heritage; others as a relief from the burden of having to memorize the writing of so many characters. In either case, the use of computers seems to up the position of Pinyin in the future, possibly to a role closer to Mao Zedong's early visions for a "universal Pinyin approach."

Although the authors' classroom study stops just as the learning of Chinese characters begins, we are furnished with estimates on what it takes to be literate in Chinese: 1500 characters for basic literacy and between 3500–4000 characters for general use (p. 5). The students are not asked (as they were for Pinyin) the advantages of taking on such a learning task; the rewards should be obvious. As the authors note (p. 3) "educators and politicians alike see reading and writing as necessary skills for citizens to function in a modern society." For Chinese, an added advantage is the cultural continuity that the characters provide (the unity argument again), creating cohesion across both place and time. Losing literacy in Chinese characters (through computer use or otherwise) "would deprive coming generations of Chinese of a rich and meaningful cultural heritage" (Wang 1982: 58). Nevertheless, despite tremendous efforts to raise literacy in China, the authors inform us that "acquiring literacy (in China today) is not a self-evidently worthwhile venture for the individual" (p. 2). On this, the authors provide an interesting side-story about a woman acquaintance with very limited literacy skills, who nonetheless becomes a successful businesswoman in the home painting industry. What is going on here?

Since Deng Xiaoping's proclamation that "it is glorious to make money," the enthusiasm of peoples from all professions in China to 下海 (i.e. 'jump into the sea' of moneymaking ventures) has turned the traditional Chinese social hierarchy (士 scholar, 农 a farmer, 工 worker, 商 businessman) on its head. While the authors do not give these kinds of background details, they do give figures for high drop-out rates in Chinese schools (primary among girls), and recount elementary teachers' complaints that parents involved in small businesses tend not to support their children's studies. The authors also raise the important question of what these social changes mean to the future of China. If "by becoming literate in Chinese characters, the transfer of the cultural

tradition is maintained" (p. 109) then what are the implications of disinterest in literacy for the future of Chinese culture and Chinese unity?

As a teacher and as an adult learner of Putonghua, I found this book interesting at several levels. Expecting from China a classroom teaching style uninspired and regimented, I was surprised instead to read of high levels of enthusiastic teaching using many creative techniques (this despite classrooms of more than 55 students). It was also interesting to relive the early learning of Pinyin and Putonghua, and to note that the learning steps for a Chinese 1st grader are largely the same as for a university student studying Putonghua as a foreign language. Finally, as a mother with a child who is embarking on learning Putonghua through the post-1997 Hong Kong educational system, the book has made me more aware and critical of the social messages that are inherent in learning a language — maybe especially Putonghua, and maybe especially now in Hong Kong.

The successful reintegration of Hong Kong is paramount as a symbol of China's strength and unity, influencing outcomes of other marginalized regions of China, such as Taiwan and Tibet. In Hong Kong, Putonghua is now taught beginning at the preschool level, courses in Putonghua are compulsory for local government officials, and public announcements are broadcast in Cantonese, English, as well as in Putonghua. At the same time, however, since 1990 "mother tongue" education in Hong Kong has been prioritized as the best way to promote literacy and succeed in education (Hong Kong Education Commission, 1990). Recent television announcements assure the Hong Kong public that "Mother tongue teaching makes learning pleasurable and effective."

While such announcements are directed at discouraging the high status accorded English as a teaching medium in Hong Kong's primary and secondary schools, there are also here implications for Hong Kong's societal transition from diglossia to triglossia. Hong Kong's "mother tongue" approach stands in direct contrast to what the authors point to as the PRC directive whereby "access to literacy ... is channeled through, or limited to, the standard language (Putonghua)" (p. 5). Some have argued that language use in Hong Kong "may prove to be the indicator by which the implementation of the principle of 'one country, two systems' can best be judged," and see Hong Kong's future identity and independence in direct correlation to its degree of adoption of Putonghua (Johnson 1998: 272–275). Putonghua's success in bringing "all under heaven (in Hong Kong and beyond) into one big family" is beyond the scope of the present study, but is certainly an interesting point of research for the future of language and literacy in China.

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Reviewer's address

Language Engineering Laboratory
City University of Hong Kong
Tat Chee Avenue, Kowloon, Hong Kong
eelel@uxmail.cityu.edu.hk

NOTES

It has become not unusual for newspapers and magazines of current events to publish articles on aspects of writing systems and literacy. It is proposed to summarize such articles here, as the occasion arises. Readers are encouraged to submit such material in the form of clippings, email bulletins, or internet references.

"First word from Asia's lost civilization." On May 15, 2001, the *London Times* reported the possibility that symbols engraved on a small stone, unearthed at an archaeological site near Ashbagat in the former Soviet Republic of Turkmenistan, may represent the written form of a language spoken in Central Asia 4,000 years ago. The stone, perhaps a seal, is associated with the Bactria Margiana Archaeology Complex. The source of the four geometric symbols, arranged in a square, has not been identified, nor is it known what spoken language the symbols may have been associated with.

"Writing gets a rewrite." The magazine *Science*, on 29 June 2001, reported interviews with archaeologists who attended the International Conference of the Fifth Millennium of Writing, held in Baghdad, Iraq, in March. The participants discussed claims regarding the antiquity of several early writing systems, including those found at Uruk, in Iraq; at Abydos, in Egypt; and at Harappa, in the Indus Valley of Pakistan.

"Breaking old Soviet ties, letter by letter." The *New York Times*, on September 2, 2001, describes changes affecting Azeri, the Turkic language which is the official tongue of the former Soviet Republic of Azerbaijan, in the Caucasus Mountains. The country's population is traditionally Muslim, and until the Russian Revolution, their language was written in Arabic script. Subsequently, under Lenin's rule, a Roman script was introduced; and then, under Stalin, a Cyrillic script. In 2001, it was decreed that, after ten years of independence in Azerbaijan, the Azeri language should once more be written in Roman script — although most books in the libraries are in Russian or in Cyrillic Azeri. A Russian-speaking minority remains in Azerbaijan; but the use of English is growing, stimulated by the influx of oil money. A photo illustrating the article shows a sign on a street in Baku which advertises as follows, starting with Roman Azeri: *Dondurma / Мороженое / Ice Cream*.

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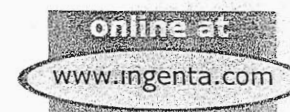
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