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Semantic development in textual contexts during the school years: Noun Scale analyses*

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ABSTRACT

The paper examines the nominal lexicon in later language acquisition as a window on linguistic knowledge and usage across childhood and adolescence. The paper presents a psycholinguistically motivated and cognitively grounded analysis of the distribution of ten semantic noun categories (the Noun Scale) across development, modality, and genre. Eighty Hebrew-speaking children (9;0 to 10;0), adolescents (12;0 to 13;0 and 16;0 to 17;0), and a group of adult university graduate students participated in the study. Each produced four different texts: a spoken and written narrative and a spoken and written expository, yielding a total of 320 texts. All lexical noun tokens in each of the 320 texts were analysed to determine their score on the Noun Scale. Results indicate that nominal density, which underlies much of the syntactic architecture of texts, increases dramatically in adolescence, towards adulthood. The paper analyses the developmental patterns of each of the ten Noun Scale categories, showing that the nominal lexicon of schoolaged children is already very different from that of young children in having only a small amount of genuinely concrete nouns, and these too only in narrative texts. The quantitative analysis shows that nouns grow more categorical and abstract with age

[*] The data-base analysed in this study constitutes part of a large-scale crosslinguistic project supported by a major grant from the Spencer Foundation, Chicago for the study of *Developing Literacy in Different Languages and Different Contexts* (Ruth Berman PI) in which closely comparable written and spoken texts were produced by schoolchildren and adults, native speakers of seven different languages (Berman & Verhoeven, 2002). The broad aims of the project were to shed light on the way in which children, adolescents, and adults construct texts – in the sense of monologic pieces of discourse; to examine the linguistic, cognitive, and communicative resources that they deploy in adapting their texts to different circumstances (in expository versus narrative discourse and in writing compared with speech); and to detect shared or different trends depending on the particular target language. Address for correspondence: Dorit Ravid, School of Education and the Department of Communications Disorders, Tel Aviv University, Tel Aviv 69978, Israel. e-mail: doritr@post.tau.ac.il

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and schooling, especially in adolescence. Written expository texts are the preferred habitat of abstract, categorical nouns from early on. The systematic qualitative analysis of noun tokens in their textual context demonstrates how the nominal lexicon undergoes fundamental changes that are affected by linguistic, cognitive and social development, in interaction with text genre and modality.

INTRODUCTION

This paper examines the development of semantic categories of nouns in 'later language development', that is, across the school years. It is motivated by the view that the lexicon plays a central role in language acquisition (Dockrell & Messer, 2004; Ravid, 2004) for a number of reasons. First, the lexicon is essential for development of syntax, since syntactic constructions depend crucially on (open-class) words for content. Second, the higher the occurrence of content words, especially nouns and adjectives, the higher the complexity of the syntactic architecture that frames them (Ravid, van Hell, Rosado & Zamora, 2002). Third, idiomatic constructions held in memory include syntactic phrases and whole clauses like *the eleventh hour, it's raining cats and dogs*. In fact, the syntactic texture of mature language derives largely from the frequent occurrence of such 'prefabricated' multilexemic units (Jackendoff, 2002). Development of the advanced lexicon thus interacts with both syntactic complexity and informative content.

The present study focuses on the nominal lexicon as a window on linguistic knowledge and usage across development. Nouns underlie the most basic building blocks of morphosyntactic structure (Anderson, 1985), and they play an important role in constructing discourse structure (Francis, 1986). Nouns occupy a central place in the study of adult psycholinguistic processes (Chiarello, Liu & Shears, 2001), and of child language development, most specifically in relation to the learning mechanisms in acquisition (Clark, 1993; Markman, 1989). Nouns thus feature large in the mental lexicon in general and in lexical development in particular. The examination of nouns across development offers interesting and potentially rewarding insights into lexical acquisition.

A key premise of the study is that nominal density also reflects nominal diversity: language users do not repeat the same noun over and over as do infants and toddlers (Richards & Malvern, 1997). When a noun is repeated in a text, it either serves a cohesive function which is well-established in children over nine years of age (Berman & Slobin, 1994; Hickmann, 2003), or else it takes on a different shade of meaning, as will be shown below. Therefore, having more nouns in the texts of older children, adolescents

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and adults means more DIFFERENT nouns and consequently a higher linguistic complexity.

Noun categories in development

Noun categories – concrete, count, individual, collective, mass, generic, categorical and abstract – have been the focus of various developmental studies relating to different stages of acquisition. The issue of INDIVIDUATION is central in the debate about noun reference in early word learning in toddlers (Golinkoff, Mervis & Hirsh-Pasek, 1994; Tomasello, Strosberg & Akhtar, 1996). There is also a large body of research on nouns referring to COLLECTIONS and on the MASS versus COUNT noun distinction in young children (Bloom & Kelemen, 1995). Some of them suggest that culture-specific input factors in maternal speech and language-specific factors such as COUNT/MASS syntax affect children's performance (Gathercole, Thomas & Evans, 2000; Gentner & Boroditsky, 2001).

As children grow older and mature cognitively, they amass a large amount of real-world and school-related knowledge that enables them to express increasingly composite concepts in abstract and complex vocabulary (Anglin, 1993). Defining abstract nouns was found to be a difficult task for adolescents and even for eighteen-year-olds (Nippold, Hegel, Sohlberg & Schwarz, 1999). A range of studies examined the acquisition of abstract and derived nominals in Hebrew. Ravid and Avidor's (1998) experimental study in children aged 5;0 to 15;0 compared with adults revealed that full mastery of derived, abstract, morphologically complex nouns emerges as late as around puberty and consolidates only in adulthood. Seroussi's (2004) sentence-construction task from pre-adolescence to adulthood showed how noun production changes from concrete, literal, prototypical, and monosemous construal and use of nouns, to abstract, metaphorical, variegated, and polysemous.

Ravid & Cahana-Amitay's (2005) analysis of narratives in the school years found that written texts, particularly those of adults, were richer in derived nouns than spoken texts. With development, there was an increase in level of abstraction and in the complexity of the syntactic contexts in which such nouns occurred. Ravid & Zilberbuch (2003) found that, with age and schooling, texts became richer in complex nominal structures, in particular written expository texts. A crosslinguistic developmental study in Dutch, English, Hebrew and Spanish texts (Ravid *et al.*, 2002) revealed a consistent increase in complex NPs from childhood to adulthood, again markedly more so in written expository texts.

These studies of text-embedded use of nouns indicate that noun categories undergo fundamental changes with age and schooling, and are heavily dependent on text type and on contexts of production. To date,

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however, there has been no research that systematically traces development of noun categories in text construction. The goal of the present study is to meet this requirement by providing a principled characterization of developmental patterns in the distribution of text-embedded noun categories. The current paper proposes, describes and tests the Noun Scale, which classifies nouns into semantic-pragmatic categories in the context of spoken and written narrative and expository texts produced by Hebrew-speaking children, adolescents, and adults.

Study variables and predictions

This study analyses the distribution of noun categories in textual context as a window on the development of the nominal lexicon. Monologic text construction was selected in order to examine whether and how young language users are able to go beyond the merely correct yet de-contexualized production of noun categories to deploying them appropriately and flexibly in context (Berman & Slobin, 1994; Ravid & Tolchinsky, 2002). Command of abstract and derived nouns requires considerable morpho-syntactic proficiency and an extensive advanced-level vocabulary, together with flexible and sophisticated strategies of form-meaning linkage, leading to the prediction that texts will become increasingly nominal (that is, they will contain more nouns), and nouns will become more categorical and more abstract as a function of age and schooling.

The distinction between the two modalities of writing and speech is known to foster two distinct styles of discourse. Spoken communication is typically produced under the pressure of rapid online processing whereas displaced time in writing allows for more planning and monitoring in offline production (Chafe, 1994; Strömqvist, Nordqvist & Wengelin, 2004). In addition, spoken language is typically more personalized and interactive, while written language is produced in more detached, less interactive settings and consequent linguistic encoding, including morphosyntax and vocabulary (Biber, 1995; Berman, Ragnarsdóttir & Strömqvist, 2002; Ravid & Zilberbuch, 2003). This leads to two predictions: First, written texts should be nominally denser than spoken texts; and second, a larger, more diversified, more categorical and abstract nominal vocabulary is expected in writing than in speech (Ravid & Cahana-Amitay, 2005).

The two genres selected for this study are narratives, which focus on people, their actions and motivations, and express the unfolding of events in a temporal framework (Berman & Slobin, 1994; Hickmann, 2003); and expository texts, which focus on issues and ideas, and express the unfolding of claims and argumentation in causal and other logical contexts (Britton, 1994; Katzenberger, 2004). Previous studies deriving from the same data base as the present one in Hebrew and in other languages,

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indicate that even young children of early grade school age distinguish clearly in linguistic expression between narrative and expository texts (Ravid, 2004) – for example, in use of verb tense, mood, and aspect, in forms of reference, in voice, and in lexical selection (Jisa, Reilly, Verhoeven, Baruch & Rosado, 2002; Ragnarsdóttir, Cahana-Amitay, van Hell, Rosado & Viguié, 2002; Tolchinsky, Johansson & Zamora, 2002). It is expected that here, too, genre will be a factor in the differential distribution of noun categories, with narratives favoring specific, concrete, and proper nouns, and expositories – categorical, generic, and more abstract nouns. In addition, nouns that convey narrative-specific content (such as reference to time and place) should be more pervasive in narrative than in expository texts.

Data elicitation, participants, data base

The study reported here analyses texts produced by 80 Hebrew-speaking children, adolescents, and adults of monolingual, middle-class backgrounds, 20 in each of four age-groups: children aged 9;0 to 10;0 (4th graders, henceforth nine-year-olds); pre-adolescents aged 12;0 to 13;0 (7th grade junior-high school students, henceforth twelve-year-olds); adolescents aged 16;0 to 17;0 (11th grade high school students, henceforth sixteen-year-olds), and a group of adults aged 25 to 35 years (university graduate students majoring in the sciences or humanities). Participants were shown a three-minute wordless video clip depicting different conflict situations in a school setting, involving unresolved, so non-narrative, scenes of interpersonal conflict in a school setting – for example, a moral conflict of whether to cheat in an exam or return a purse someone dropped, a social conflict of how to treat a new student who interfered in a conversation, and a physical conflict of fighting during recess. After seeing the video clip, each participant was required to produce four texts in randomly balanced order. They were asked to write and tell a story about an incident where they had been involved in a situation of 'problems between people' (a personal-experience narrative) and to write a composition and give a talk in which they discuss the topic 'problems between people' (an expository discussion).

This yielded a total of 320 texts, since each of the 80 subjects produced four different texts: a spoken and written narrative and a spoken and written expository. This methodology allowed us to control the variables of age, genre, and modality – because the same subjects produced each of the four texts. Moreover, these are all 'authentic' texts elicited from 'naïve' speaker-writers without any editing or revision on the part of the investigators. And they were elicited from speaker-writers of 'standard Hebrew' – non-specialists in language and non-experts in writing

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(excluding, for example, teachers, lecturers, journalists, authors) but well-educated and 'mainstream' in social class and literacy background.

Analysis

Discourse-sensitive analysis of the lexical composition of texts requires that the functions and roles of words be considered in context, to ensure methodologically valid decisions. My assumption is that a noun lemma or TYPE is a coarse-grained entity encapsulating a cluster of interwoven meanings, each finding expression in different contexts. At the same time, each noun TOKEN conveys fine-grained semantic-pragmatic quanta dictated by its syntactic and discursive context. For example, Hebrew *mivxanim* 'tests, exams' might convey an imageable meaning in the context of a teacher handing out *test papers*, a more abstract meaning in the context of the term *end-of-year exams*, and a highly abstract meaning in referring to life's *trials and tribulations*. Since my major interest is in the actual deployment and use of each and every noun occurrence in textual context, the analyses presented in this study are based on noun TOKENS rather than TYPES.

All the lexical noun tokens (that is, excluding pronouns such as *him, myself*) in each of the 320 texts were identified and counted. Since nouns carry a major part of the referential information in the text, the nominal density of each text was calculated as a mean number of nouns per clause – the basic unit of syntactic and prepositional analysis in this as in other crosslinguistic studies (Berman & Slobin, 1994: 660–3; Berman & Verhoeven, 2002: 11) to neutralize different text lengths. Each noun was then assigned a category on the proposed Noun Scale (below), taking into account its syntactic and discourse contexts, as noted above and elaborated below. All analyses were conducted by three native-speakers of Hebrew with training in linguistics, with inter-judge reliability reaching 91%, and disputes settled by discussion.

The Noun Scale

The Noun Scale described below is a means of ranking and classifying nouns in their textual context from two points of view. As a RANKING tool, it assigns nouns a score of 1–10 on a scale of 10, going from first to third-order nominals, with individuated, concrete nouns at the lower levels and increasing categoriality and abstractness at the higher levels. At the same time, the Noun Scale is also a CLASSIFYING tool, since it categorizes nouns by their semantic-pragmatic content as related to text topic and genre. From this perspective, ranking is less important than classification by content. Thus ranks on the Scale are referred to below as either LEVELS or CATEGORIES, depending on the context of analysis. This section defines the levels/categories constituting the proposed Noun Scale, with examples for

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each level, either translated from the Hebrew database or taken from the English database of the crosslinguistic project (see note 2).

Level 1. Concrete nouns. This level includes only genuinely concrete, mostly count nouns[1] such as *back-pack, ball, bike, doors, jar, ruler, folder*; as well as nouns designating specific persons in the text, such as *a boy* (*from my class*). Note that the same noun label can occupy different levels on the Scale, since the same word *kids* comes up again at Level 5.

Level 2. Proper names. This level includes proper nouns designating individuals e.g. *Racheli, Shany, Tiffany*. The first two levels roughly correspond to Lyons' (1977) *first-order* nominals referring to stable physical entities – persons, animals, and things.

Level 3. Collective/Location [*reference group*] *nouns*. This category expresses The intrinsic relationship between locations and collective nouns bounded within a given location (Langacker, 1991). Consider the inherent ambiguity of a word like *library*, as designating both a *place* where books are held and a *collection* of books. In the same vein, if a Hebrew-speaking ten-year-old says '*I went out to play soccer with the neighbourhood*', it is clear that he is referring to the collection of children in his neighbourhood. Level 3 thus includes nouns such as *army, business, camp, class, city, club, family, kibbutz, orchestra, school*. Note that in the context of the clause *Yesterday, a kid from 6th grade hit me, 6th grade* is a reference group noun; but see Level 6 below for the same term with a temporal designation. Level 3 also contains rarer, lexically-specific reference group nouns belonging to a higher register, where the term 'register' is used in the sense of 'the linguistic differences that correlate with different occasions of use' (Ferguson, 1994, p. 16). For example, *administration, background, community, cult, environment, generation, government, institute, population, system* are all location/reference group nouns on a higher level of linguistic register than, say, *home* or *school*.

Level 4. Role nouns. This is a category of nouns referring to people via their social roles. The idea here is that there is a difference in degree of abstractness and categoriality between genuine concrete nouns such as *glass* or even *man*, on the one hand, and nouns that denote people's roles in relation to other individuals or to institutions, such as, *cousin, counselor, class queen*, *neighbour* or *pupil*. I regard role nouns as both removed semantically from the concrete sense and also less specific and individuated than nouns at Levels 1 and 2. Examples from the texts include roles such as *mother, father, brother* and *teacher*, but also *coach, date, driver, guide, non-boarder, principal, parents, room-mate, soldier, step-dad, wife*. This level also included high-register, lexically specific role nouns, e.g. *chiropractor, co-worker, dean, employer, member, musicians, rival, partner, peer, pole-vaulter, team-head*.

[1] Examples are all taken from the Hebrew texts and presented in English translation.

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Together, Levels 3 and 4 refer to two of the most conspicuous entities in our database, which, to recall, concerned personal experience stories and expository discussions of the shared, socially relevant topic of interpersonal conflict: people with social roles and their reference groups. Together with Level 5 they constitute the transition between Levels 1–2 first-order individuated nominals to second-order entities.

Level 5. Generic nouns. Level 5 contains generic nouns which refer to people and things in general (Foley & Van Valin, 1985). The role of syntactic context and temporal reference is crucial here, since a noun such as *kids* may refer to specific children (*the kids in my class*) and so receive the rank of 1, but it may also refer to *kids* in general, and so receive the rank of 5 (e.g. *kids don't like to get a lot of homework*). This is also the only category where indefinite pronouns like *nobody* or *something* – that is non-lexical pronominals – were included on the Scale. Examples of Level 5 are lexical nouns such as *boys, individuals, people, stuff, things*; as well as pronominals such as *each other, everybody, nobody, somebody, something*.

The next three levels - 6, 7 and 8 – are based on Lyons' (1977) *second-order* entities, and refer to observable events, processes, or states of affairs that take place in time.

Level 6. Temporal nouns. Nouns designating temporal units (e.g. *minute, hour, month*) have long posed problems for nominal analysis (Lyons, 1977). Are these 'real' nouns? Do they designate nominal or adverbial meaning? The Noun Scale enables us to pull out all these nouns irrespective of their syntactic context, which was often prepositional in structure and calendrical in content, and include them in this analysis, e.g. (*for a*) *week,* (*half a*) *year* (*ago*), (*one*) *day,* (*two*) *months,* (*a certain*) *hour,* (*those*) *seconds,* (*all that*) *night,* (*in that*) *season*. In addition, as noted earlier, nouns which are not prima facie temporal in reference but that occur in a context that elicits a temporal interpretation were also assigned to this level, e.g. *6th grade*, as in *when I was in 6th grade …*'.

Level 7. Event nouns. This is the least abstract and most 'imageable' of the four highest levels on the Noun Scale. It designates event nouns such as *battle, cases, class* (*i.e., lesson*), *events, game, lunch, party, quiz, session, triathlon, therapy*, which refer to events with a duration, in contexts such as *story* (*is over*), (*during the*) *movie,* (*play*) *soccer,* (*go to a*) *show*. It is no accident that event nouns follow temporal nouns on the Noun Scale: they are related, with temporal nouns serving as the bridge to the higher level of 'less strictly nominal' abstractness. In case the noun is ambiguous between temporals and events, the error in assigning category is not that great.

Level 8. Imageable abstract nouns. These are abstract yet observable and imageable nouns (Nitto, Suehiro & Hori, 2002) such as *exam* in the sense of *the exam paper*. Examples include *blows, kicks, scratch, yells*, as well as other cases where nouns were contexualized, imageable, less abstract, as

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TABLE 1. *Mean number and standard deviation* (*in brackets*) *of nouns per clause in texts, by age* (*four groups*), *modality* (*speech, writing*), *and genre* (*narratives, expositories*)

Age groups	Spoken narratives	Written narratives	Spoken expositories	Written expositories
G 9–10	0·98	1·12	1·01	1·45
	(0·51)	0·58	(0·39)	(0·95)
J 12–13	0·8	1·07	0·97	1·45
	(0·4)	(0·47)	(0·23)	(0·51)
H 16–17	0·92	1·34	1·32	2·05
	(0·46)	(0·69)	(0·45)	(1·06)
Adults	1·25	1·67	1·55	2·64
	(0·4)	(0·52)	(0·46)	(1·06)

in (*I whispered the*) *answers*. Also included here are all abstract nouns appearing in the context of lexicalized and metaphorical expressions such as *the road to peace*. This made it possible to include every nominal in the text in my analysis, even ones that occur in frozen prefabricated expressions such as (*blow something out of*) *proportion*, (*broadcast on the same*) *wavelength*, (*gets his*) *kicks*, (*in a negative*) *manner*, (*keep under*) *control*, (*no*) *choice*, (*on*) *purpose*, (*reach a*) *conclusion*, (*totally off their*) *rocker*.

Finally, Lyons' *third-order* entities, the most abstract and least individuated nouns which lie outside space and time, appear here as levels 9 and 10.

Level 9. Abstract nouns. These are genuinely abstract, non-imageable, in many cases non-individuated nouns (Langacker, 1991) such as *authority, career, challenge, character, dignity, dimensions, discipline, emotion, fatigue, feedback, harmony, issue, joy, opinion, plans, pride, pneumonia, power, relationship, religion, respect, theories, topic, sign, source, standard, style*.

Level 10. Derived abstract nominals. Here is the only place on the Noun Scale where morphological structure is taken into account in addition to semantics. These are abstract nouns derived from verbs, adjectives and other nouns. Examples include *annoyance, behavior, communication, confrontation, discussion, ease, intervention, negativity, prejudgments, pressure, separation, supervision, tolerance, unpleasantness*.

RESULTS

The first analysis was of NOMINAL DENSITY, measured by mean number of lexical nouns per clause, as shown in Table 1.

A three-way ANOVA (4)age: 9;0 to 10;0, 12;0 to 13;0, 16;0 to 17;0, adults × (2)modality: spoken, written × (2)genre: narratives, expositories yielded all three effects as predicted: increase of nominal density with

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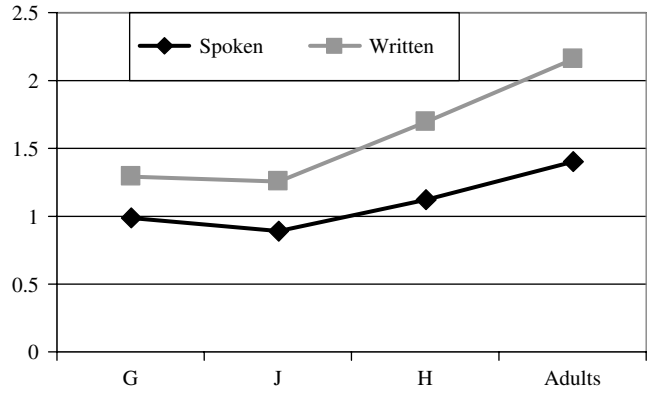


Fig. 1. Interaction of age (four age groups) and modality (spoken and written texts) in mean number of nouns per clause.

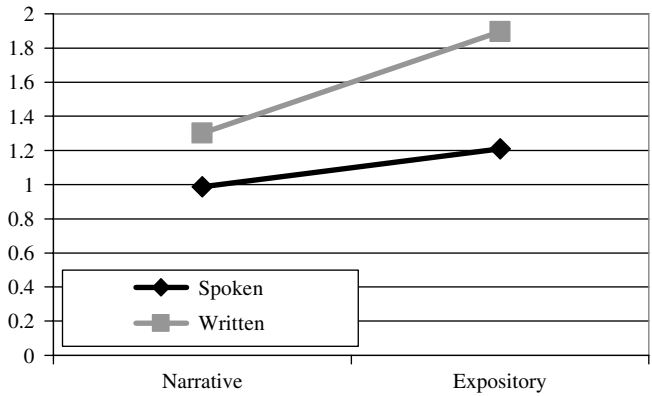


Fig. 2. Interaction of modality (spoken and written texts) and genre (narrative and expository texts) in mean number of nouns per clause.

age ($F(3, 76) = 14{\cdot}63$, $p < 0{\cdot}0001$) – the adult group had the highest number of nouns per clause (Scheffé analysis); modality ($F(1, 76) = 83{\cdot}69$, $p < 0{\cdot}0001$) – written texts are nominally denser than spoken texts; and genre ($F(1, 76) = 26{\cdot}95$, $p < 0{\cdot}0001$) – expository texts are nominally denser ($M = 1{\cdot}55$) than narratives ($M = 1{\cdot}14$). Two interactions mitigated these simple effects: age × modality ($F(1, 76) = 3{\cdot}63$, $p < 0{\cdot}02$), in Figure 1; and modality × genre ($F(1, 76) = 12{\cdot}52$, $p < 0{\cdot}002$), in Figure 2, both investigated at the 0·05 level by the Bonferroni Test.

Age × modality: written texts are nominally denser than spoken texts only in the two older groups, with adult texts the densest. Modality × genre: written expositories are nominally denser than all other text types.

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TABLE 2. *Mean scores and standard deviation* (*in brackets*) *of text scores on the Noun Scale* (1–10), *by age* (*four groups*), *modality* (*speech, writing*), *and genre* (*narratives, expositories*)

Age groups	Spoken narratives	Written narratives	Spoken expositories	Written expositories
G 9–10	4·41 (1·3)	4·57 (1·29)	5·66 (1·53)	5·98 (1·04)
J 12–13	5·41 (0·82)	5·14 (1·25)	6·55 (0·84)	7·24 (0·78)
H 16–17	5·39 (1·23)	5·62 (1·39)	7·0 (0·78)	7·49 (0·78)
Adults	6·74 (1·13)	6·81 (1·09)	7·57 (0·71)	7·97 (0·47)

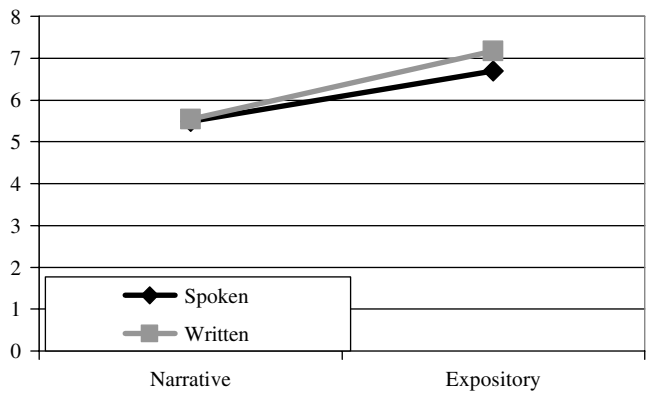


Fig. 3. Interaction of modality (spoken and written texts) and genre (narrative and expository texts) in Noun Scale scores.

A second analysis assigned each text a score on the Noun Scale averaged from all noun scores in the text. In this case, high-register nouns from categories 3–5 (e.g. *administration, rival*) were re-coded as level 9 (Table 2).

A three-way ANOVA (age × modality × genre) conducted on the data in Table 2 yielded all three effects, as predicted: age ($F(3, 75) = 27{\cdot}27$, $p < 0{\cdot}0001$) – a rise on the Noun Scale with age and schooling in three different subsets (Scheffé): The 9;0 to 10;0 group, the 12;0 to 13;0 and 16;0 to 17;0 groups, and adults; modality ($F(1, 75) = 10{\cdot}04$, $p < 0{\cdot}003$) – written texts have a higher score than spoken texts; and genre ($F(1, 75) = 117{\cdot}82$, $p < 0{\cdot}0001$) – expository texts have a higher score than narratives. One interaction of modality × genre ($F(1, 75) = 8{\cdot}25$, $p < 0{\cdot}006$) mitigated these simple effects (Figure 3). The Bonferroni Test showed that

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spoken and written narrative texts had the same score, whereas the written expositories had the highest score of all other text types.

Distribution of noun categories: age, modality, genre

Consider, next, the percentage distribution of the ten Noun Scale levels (termed here *categories*) out of all nouns across the three study variables (Table 3).

Separate 3-way analyses (age × modality × genre) were conducted on each of the categories, with further *post hoc* Scheffé and Bonferroni tests.

Category 1. Concrete nouns and specific persons: genre ($F(1,75)=44{\cdot}9$, $p<0{\cdot}0001$) – narratives have more Category 1 nouns than do expositories. *Category 2. Proper names*: genre ($F(1,75)=9{\cdot}17$, $p<0{\cdot}004$) – narratives have more proper names than expositories. *Category 3. Reference group nouns*: age ($F(3,75)=5{\cdot}06$, $p<0{\cdot}004$) – the sixteen-year-olds have the most Category 3 nouns; genre ($F(1,75)=12{\cdot}92$, $p<0{\cdot}002$): Narratives have more reference group nouns than expositories. *Category 4. Role nouns*: genre ($F(1,75)=46{\cdot}86$, $p<0{\cdot}0001$) – narratives have more role nouns than do expositories. *Category 5. Generic nouns*: age ($F(3,75)=9{\cdot}93$, $p<0{\cdot}0001$) – generics decline with age and schooling, most in the nine-year-olds; modality ($F(1,75)=5{\cdot}26$, $p<0{\cdot}03$) – spoken texts have more generic nouns than do written texts; genre ($F(1,75)=95{\cdot}43$, $p<0{\cdot}0001$) – expositories have more generic nouns than do narratives, but (see Figure 4, Interaction age × genre ($F(3,75)=11{\cdot}79$, $p<0{\cdot}0001$) only in the two younger groups, and expositories by nine-year-olds contain the highest proportion of generic nouns.

Category 6. Temporal nouns: age ($F(3,75)=4{\cdot}16$, $p<0{\cdot}01$) – twelve-year-olds have the most temporal nouns, adults the fewest; genre ($F(1,75)=83{\cdot}32$, $p<0{\cdot}0001$) – narratives contain more temporal nouns than do expositories, but (interaction age × genre ($F(3,75)=2{\cdot}97$, $p<0{\cdot}04$), Figure 5) only in the two younger groups; narratives by twelve-year-olds have the most temporal nouns.

Category 7. Event nouns: genre ($F(1,75)=11{\cdot}04$, $p<0{\cdot}002$) – narratives have more event nouns than do expositories. *Category 8. Imageable abstract nouns*: genre ($F(1,75)=22{\cdot}83$, $p<0{\cdot}0001$) – expositories have more imageable abstract nouns than do narratives. *Category 9. Abstract nouns*: age ($F(3,75)=16{\cdot}16$, $p<0{\cdot}0001$) – abstract nouns increase with age and schooling, especially from age 12;0 to 16;0; genre ($F(1,75)=21{\cdot}83$, $p<0{\cdot}0001$) – expositories have more abstract nouns than do narratives. *Category 10. Derived abstract nouns*: age ($F(3,75)=11{\cdot}85$, $p<0{\cdot}0001$) – derived abstract nouns increase with age and schooling, in three different subsets – the two younger groups, the sixteen-year-olds, and the adults; modality ($F(1,75)=8{\cdot}01$, $p<0{\cdot}007$) – written texts have

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TABLE 3. *Mean percentages and standard deviation (in brackets) of nouns (out of all nouns) in the 10 categories, by age (four groups), modality (speech, writing), and genre (narratives, expositories)*

	Level number	1	2	3	4	5	6	7	8	9	10
Age groups	Level content	Concrete nouns	Proper names	Reference group nouns	Role nouns	Generic nouns	Temporal nouns	Event nouns	Imageable nouns	Abstract nouns	Derived abstract nouns
G 9–10	Spoken narratives	13·38 (17·57)	5·86 (13·95)	16·45 (16·46)	21·62 (21·98)	13·05 (17·67)	11·58 (12·59)	5·13 (9·22)	10·23 (16·97)	0·11 (0·48)	2·61 (11·17)
	Written narratives	11·54 (14·52)	7·6 (16·9)	10·49 (14·27)	25·94 (27·29)	10·1 (14·33)	13·71 (15·16)	6·34 (13·56)	13·59 (25·06)	0	0·69 (2·24)
	Spoken expositories	6·88 (17·9)	0	6·35 (12·01)	6·26 (9·14)	47·84 (26·61)	1·79 (7·45)	3·18 (6·73)	15·69 (20·35)	4·35 (8·31)	7·65 (22·43)
	Written expositories	2·67 (11·93)	0	5·95 (11·08)	6·8 (14·09)	50·13 (23·88)	1·17 (3·63)	0·89 (2·83)	21·74 (20·76)	4·91 (8·79)	5·74 (13·14)
J 12–13	Spoken narratives	9·15 (9·25)	0·5 (1·72)	11·32 (11·4)	17·67 (19·94)	16·2 (17·14)	18·99 (13·16)	4·0 (7·02)	13·08 (11·52)	4·65 (7·24)	4·45 (7·81)
	Written narratives	14·46 (15·81)	2·93 (8·93)	15·9 (13·42)	16·33 (17·58)	8·32 (10·74)	15·29 (10·44)	5·57 (10·82)	13·04 (11·6)	3·36 (5·93)	4·8 (7·82)
	Spoken expositories	1·84 (3·98)	0	9·9 (10·26)	4·33 (5·19)	33·1 (10·39)	4·86 (7·32)	2·32 (3·3)	23·41 (14·61)	8·38 (9·62)	11·84 (11·95)
	Written expositories	0·67 (2·11)	0	6·57 (8·59)	3·13 (5·22)	28·53 (17·56)	2·94 (5·2)	1·84 (2·74)	31·82 (19·53)	9·32 (10·56)	14·43 (10·97)
H 16–17	Spoken narratives	8·6 (12·44)	2·09 (4·25)	21·92 (14·91)	11·74 (7·88)	17·16 (17·75)	9·05 (7·1)	1·67 (2·83)	12·07 (11·83)	10·36 (12·94)	5·35 (7·95)
	Written narratives	7·82 (7·93)	0·92 (2·5)	23·46 (17·38)	14·66 (11·18)	13·54 (15·46)	9·09 (8·03)	3·13 (5·68)	8·68 (9·42)	9·51 (10·62)	9·18 (7·91)
	Spoken expositories	1·74 (4·28)	0·06 (0·26)	13·92 (11·32)	2·26 (4·5)	25·47 (11·93)	3·35 (5·17)	1·83 (2·47)	22·23 (14·22)	16·22 (10·44)	12·92 (7·27)
	Written expositories	0·61 (1·57)	0·14 (0·62)	12·37 (12·64)	4·46 (8·81)	20·91 (13·06)	2·7 (3·74)	1·84 (2·74)	18·61 (10·89)	17·47 (12·22)	20·89 (10·34)
Adults	Spoken narratives	6·06 (9·47)	1·39 (3·49)	10·98 (10·07)	11·67 (11·65)	10·01 (9·51)	10·53 (7·14)	7·64 (6·47)	16·22 (9·05)	11·88 (10·09)	13·5 (10·94)
	Written narratives	5·89 (8·4)	1·8 (4·24)	15·11 (13·04)	14·05 (10·59)	7·33 (5·05)	6·23 (5·29)	5·78 (8·53)	12·09 (9·08)	14·76 (13·55)	16·94 (12·19)
	Spoken expositories	0·83 (2·38)	0·29 (1·32)	9·94 (10·52)	5·04 (5·19)	21·67 (14·34)	1·85 (4·28)	1·7 (2·56)	20·28 (15·7)	19·22 (8·92)	19·09 (10·41)
	Written expositories	0·39 (1·0)	0·18 (0·63)	9·13 (7·35)	3·48 (4·26)	18·77 (9·13)	1·74 (2·23)	0·81 (1·66)	20·64 (13·03)	16·91 (10·0)	27·95 (12·19)

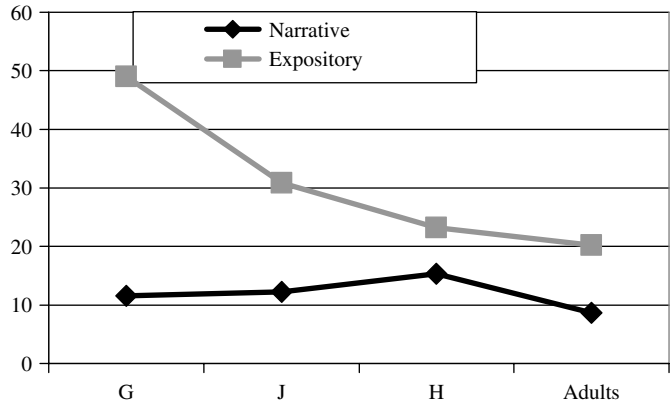


Fig. 4. Interaction of age (four age groups) and genre (narrative and expository texts) in percentage of generic nouns.

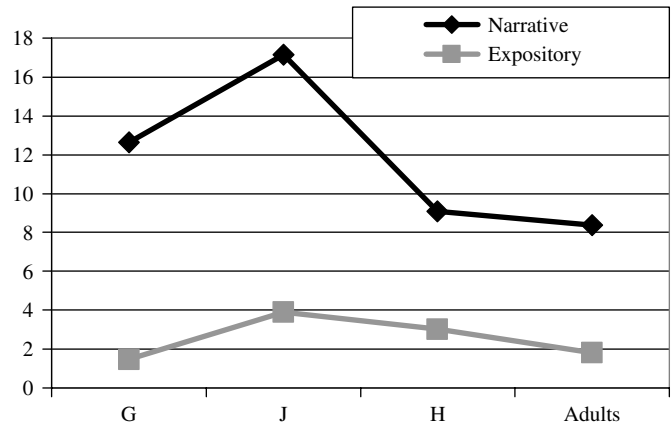


Fig. 5. Interaction of age (four age groups) and genre (narrative and expository texts) in percentage of temporal nouns.

more derived abstract nouns than do spoken texts. This is mitigated by an age × modality interaction ($F(3, 75) = 3{\cdot}58$, $p < 0{\cdot}02$) (Figure 6) – written adult texts have the most derived abstract nouns, followed closely by spoken adult and written texts by sixteen-year-old; genre ($F(1, 75) = 36{\cdot}45$, $p < 0{\cdot}0001$) – expositories contain more derived abstract nouns than do narratives; interaction modality × genre ($F(1, 75) = 4{\cdot}46$, $p < 0{\cdot}04$) (Figure 7) – written expositories have the most derived abstract nouns of all text types.

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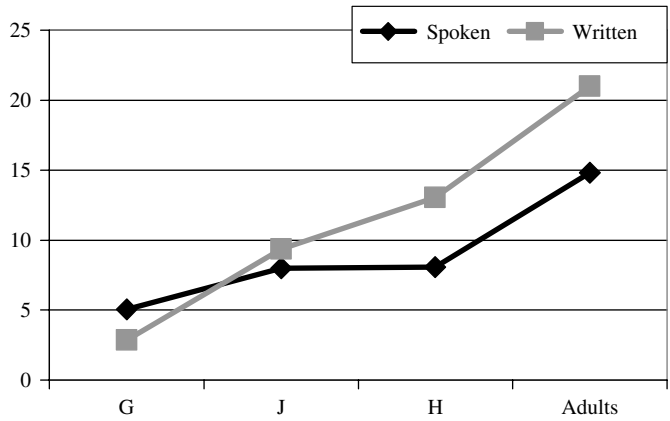


Fig. 6. Interaction of age (four age groups) and modality (spoken and written texts) in percentage of derived abstract nouns.

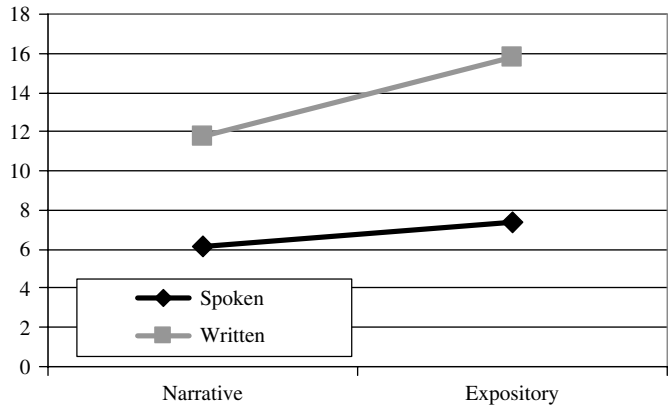


Fig. 7. Interaction of modality (spoken and written texts) and genre (narrative and expository texts) in percentage of derived abstract nouns.

Genre-specific distribution of categories

A final analysis was conducted to see the differential size of the Noun Scale categories in narratives versus expositories beyond development. Genre emerged as a simple effect in all ten categories, while modality was significant in only two, and interacted with other variables in another two. I therefore averaged the percentages of the same category in the two modalities in each genre (Table 4, a – narrative, b – expository), with a

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TABLE 4. *Ranking order of the* 10 *categories and significant differences* (*Bonferroni*) *between categories within each genre* (*a – narratives, b – expositories*)

A. Narratives

Category	Level on the Scale	Size	4	3	8	5	6	1	10	9	7	2
Role	4	16·51%										
Reference group	3	15·53%										
Imageable abstract	8	13·46%										
Generic	5	11·81%										
Temporal	6	11·6%	√									
Concrete	1	9·47%	√	√								
Derived abstract	10	7·13%	√	√	√	√	√					
Abstract	9	6·78%	√	√	√	√	√					
Event	7	4·85%	√	√	√	√	√					
Proper name	2	2·87%	√	√	√	√	√	√				

B. Expositories

Category	Level on the Scale	Size	5	8	10	9	3	4	6	1	7	2
Generic	5	30·76%										
Imageable abstract	8	22·05%	√									
Derived abstract	10	15·05%	√	√								
Abstract	9	12·07%	√	√								
Reference group	3	9·18%	√	√	√							
Role	4	4·49%	√	√	√	√						
Temporal	6	2·5%	√	√	√	√						
Concrete	1	1·94%	√	√	√	√						
Event	7	1·88%	√	√	√	√						
Proper Name	2	0·1%	√	√	√	√						

two-way ANOVA (10)category × (2)genre conducted on these means: it was not possible of course to see an effect of genre, since the average of each category is always 10%; but the analysis yielded an effect of category ($F(9, 711) = 29{\cdot}06$, $p < 0{\cdot}0001$), and an interaction of category and genre ($F(9, 711) = 32{\cdot}64$, $p < 0{\cdot}0001$).

High-register nouns

Recall that alongside neutral-register nouns, the middle categories 3–5 (role, referential group and generic nouns) contained items of higher linguistic register – rarer, lexically specific, literate nouns that were counted separately to determine the impact of age, genre and modality on their

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TABLE 5. *Mean percentages and standard deviation* (*in brackets*) *of high-register nouns* (*out of all nouns*) *in categories* 3–5, *by age* (*four groups*), *modality* (*speech, writing*), *and genre* (*narratives, expositories*)

	Level number	3	4	5
Age groups	Level content	Reference group	Role nouns	Generic nouns
G 9–10	Spoken narratives	0 (0)	0 (0)	0 (0)
	Written narratives	0·46 (2·03)	0 (0)	0 (0)
	Spoken expositories	0·29 (1·32)	0 (0)	0 (0)
	Written expositories	0 (0)	0·91 (4·07)	1·67 (7·45)
J 12–13	Spoken narratives	2·09 (4·53)	0 (0)	0 (0)
	Written narratives	4·36 (9·58)	0 (0)	0 (0)
	Spoken expositories	2·26 (4·87)	0 (0)	0·19 (0·82)
	Written expositories	4·3 (7·38)	0·41 (1·76)	0·59 (2·55)
H 16–17	Spoken narratives	3·05 (6·66)	0 (0)	0 (0)
	Written narratives	3·36 (7·38)	2·14 (5·43)	0 (0)
	Spoken expositories	5·58 (5·83)	0 (0)	0 (0)
	Written expositories	6·85 (8·61)	0·41 (1·55)	0·29 (1·32)
Adults	Spoken narratives	2·01 (2·63)	5·86 (9·94)	1·08 (3·83)
	Written narratives	3·12 (5·32)	7·48 (8·89)	0 (0)
	Spoken expositories	6·22 (9·02)	1·78 (2·62)	0·24 (0·64)
	Written expositories	5·72 (5·57)	1·89 (2·76)	0·98 (2·55)

acquisition. Table 5 gives the mean percentages of higher-register nouns in categories 3,4,5 out of all nouns by age, modality and genre. Separate 3-way analyses (age × modality × genre) were conducted on each of the three categories. *Category 3. Reference Group nouns*: age ($F(3, 75) = 5{\cdot}64$, $p < 0{\cdot}003$) – high-register nouns first occur in twelve-year-olds; genre ($F(1, 75) = 4{\cdot}65$, $p < 0{\cdot}04$) – expository texts contain more high-register reference group nouns than do narratives. *Category 4. Role nouns*: age ($F(3, 75) = 11{\cdot}15$, $p < 0{\cdot}0001$) – high-register role nouns occur only in the

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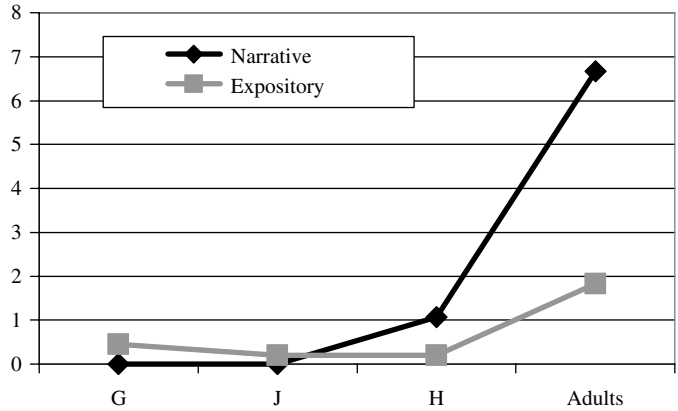


Fig. 8. Interaction of age (four age groups) and genre (narrative and expository texts) in percentage of high-register role nouns.

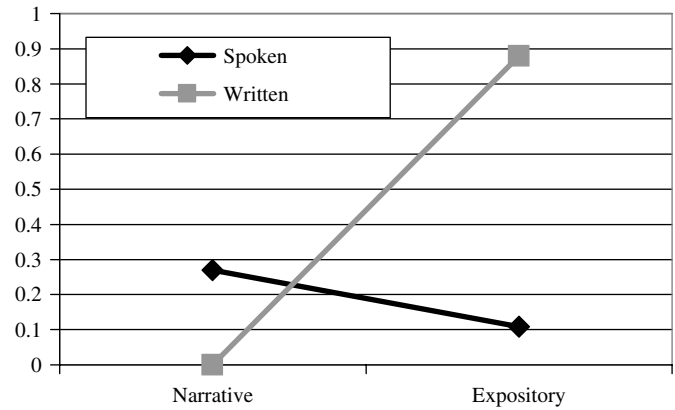


Fig. 9. Interaction of modality (spoken and written texts) and genre (narrative and expository texts) in percentage of high-register generic nouns.

adult group; modality ($F(1, 75) = 7{\cdot}03$, $p < 0{\cdot}02$) – written texts contain more high-register role nouns than spoken texts; genre ($F(1, 75) = 5{\cdot}7$, $p < 0{\cdot}02$) – narrative texts contain more high-register role nouns than do expositories, but (age × genre interaction ($F(3, 75) = 5{\cdot}42$, $p < 0{\cdot}003$), Figure 8) only in the adult group.

Category 5. Generic nouns: interaction modality × genre ($F(1, 75) = 3{\cdot}91$, $p = 0{\cdot}052$), (Figure 9) – the only text type with high-register generic nouns is the written expository.

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DISCUSSION

Below I discuss the quantitative results of the study and present a qualitative analysis of the ten Noun Scale categories.

Nominal density and score on the scale

Two preliminary analyses assessed the combined role of development, modality, and genre in the occurrence of nouns in the texts. One analysis revealed that NOMINAL DENSITY, which underlies much of the referential and syntactic architecture of texts (Halliday, 1989; Biber, 1995; Ravid, 2004), increases dramatically in adolescence, towards adulthood. The rich syntactic structure that is typical of adult texts thus consolidates very late in terms of language acquisition, around 16;0 to 18;0, and is highly dependent on the combined effect of literacy and socio-cognitive factors (Nippold, 1998; Ravid & Zilberbuch, 2003). Across this study, genre emerges as a stronger diagnostic than modality, a finding which is consistent with results of analyses of other linguistic and discursive features of the same data base in different languages (e.g. Berman & Verhoeven, 2002; Berman & Nir-Sagiv, 2004). Written texts are nominally denser than spoken texts only in the older groups, and especially in the adults. Only written adult texts contain chains of nouns and consequently large chunks of long and complex, inter- and intra-related NPs and PPs serving a variety of syntactic functions and hosting relative clauses, the most cognitively challenging subordination type (Ong, 1992). In younger age groups, both spoken and written texts are nominally 'light' and consequently contain shorter and less complex nominal structures, which are easier to process (Halliday, 1989; Chafe, 1994; Ravid *et al.*, 2002). But across all age groups, expository texts are nominally denser than narratives, and hence more complex linguistically and informatively richer. And as found in Ravid (2004), written expositories are nominally denser than all other text types. This finding is consistent across all the analyses conducted in the present study.

Against this background, we now turn to the Noun Scale itself. An analysis of the average Noun score across the texts revealed a gradual increase in the degree of categoriality and abstractness of the text, with cutoff points towards and again after adolescence. The noun score was highly diagnostic across all four text types in combination with development: written texts, taking a detached stance and with a higher lexical and syntactic density, have a higher score than spoken texts, which are typically more personalized and interactive. Expository texts, concerned with abstract, general issues, score higher on the Scale than personal-experience narratives, which focus on people participating in events. In all four age groups (except for narratives in the adolescent groups), the noun score

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has the following ascending order: spoken narratives→written narratives→ spoken expositories→written expositories. Written expositories have the highest noun score of all four text types. The scores within each age group illustrate this robust finding, rising not only with age and schooling but also within each group across text types (Table 2). This foreshadows one of the main findings of this paper – the fact that counter to popular thought, even spoken personal narratives by nine-year-olds make sparse use of genuinely individuated, concrete nouns (1–2 on the scale); instead, they recruit general, categorical nouns with appropriate modulations for genre and modality in their text production. True, this finding is limited to the discourse types investigated in this study and does not cover spoken conversation (which contains few lexical nouns, see Chafe, 1994). But the fact that each of the participants produced four different texts in two modalities and two genres does provide us with sufficient data on language variation to support these conclusions.

GENRE, DEVELOPMENT AND MODALITY IN THE DISTRIBUTION OF NOUN CATEGORIES

Of the three study variables, the distribution of noun categories is most deeply intertwined with text genre: genre was statistically significant in every single category (including the high-register analysis), in contrast to modality, which featured only in generics and derived abstracts. Age was significant in only half of the categories – reference group, generic nouns, temporal, abstract, and derived abstract nouns. The discussion will thus focus on the important role of genre in the development of the nominal lexicon, highlighting the factor of modality at specific sites.

Concrete nouns and proper names

On the whole, the database contains few genuine 'first-order' sortals – concrete nouns denoting count, 'bounded', physical objects of the type discussed in Langacker (1991) and Lyons (1977) – typically expressed by categories 1 and 2 on the Noun Scale. One reason that comes to mind is the topic of the texts elicited in this study – interpersonal conflict, which focuses on people rather than concrete objects. As I show throughout the category analysis, monologic texts elicit the production of higher-order nominals from early on.

Only narratives contain 1–2 nouns: averaged across populations, concrete nouns and proper names constitute just under 10% of the nouns in narratives, and are among the less frequent narrative categories. Expositories contain a negligible number of these categories (Table 4). This distribution is a reflection of the different DISCOURSE STANCE of genres (Berman *et al.*,

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2002): Personal-experience narratives are specific and anchored in real time and space, referring to individuals and objects, while expositories are concerned with general, categorical, abstract issues and refer marginally if at all to sortals. Regarding development, the interesting finding is children's early ability to discern the preferred habitat of categories 1–2 nouns and to demarcate narratives from expositories in their use of nouns. Thus there are very few sortals in expositories by nine-year-olds and practically none in the older age groups. Yet, interestingly, even children's narratives contain a surprisingly low number of concrete, individuated entities. Most reference to individual people across the narratives, especially from twelve years of age onwards, uses the more distanced and less individuated labels provided by role nouns (see 4.2.2 below).

A qualitative analysis of 1–2 nouns in the narratives reveals the interaction of development with social, cognitive, and literacy-related factors. Most narratives by younger participants relate quite uniform personal-experience conflicts: the narrator as protagonist, either victim or abuser, in dynamic peer-group conflicts in a school setting. Concurrently, 1–2 nouns usually refer to individual classroom peers in terms of 'a boy/girl from my class'. When peers' given names are used, young narrators designate their relationship to the narrator as part of the attendant circumstances. Thus for example, a nine-year-old boy writes *There was a boy who had been targeted before me, his name was Dima*.

Narratives by sixteen-year-olds are a mixed bag: some resemble stories by twelve-year-olds, others consist of general commentary on the topic 'conflicts between people'. Several narratives focus on the group as a whole (e.g. how the children's community was disrupted by a newcomer). A small number of narratives about non-dynamic inter-personal conflicts are precursors of adult stories (e.g. agonizing whether to tell about theft from the kibbutz grocery). The impact of peer-group pressure is evident in the narratives by sixteen-year-olds, which are less personal and face away from the narrator – either by focusing on the peer group or by highlighting outlier individuals. As a result, there is not a single mention of a given name, and most individuals are designated by role labels. Adult narratives present an interesting dichotomy: many of them do not contain any 1–2 nouns, reflecting the more abstract and categorical nature of adult personal narratives; but on the other hand, adults, unlike adolescents, are willing to express their feelings as individuals, with a number of detailed personal stories of conflicts in family, community, and work settings and with specific mention of people's given names. Adults' cognitive and rhetorical flexibility is apparent in their ability to present the same noun as both a concrete object (*he found my personal diary*) and as an imageable process noun (*I conducted a personal diary*). Adults alone are able to present specific figures in stylized categorical terms, for example, a man describing fighting

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with both his wife and his neighbour in terms of *a classic triangle*. And again only adults insert short narrative-like passages inside their expository texts to illustrate their general point, thereby introducing the only reference to specific people and concrete objects (e.g. a student's schoolbag) in the expository sample as a whole.

Role and reference group (location/collective) nouns

ROLE and REFERENCE GROUP nouns (RRGns, categories 3–4) occupy a considerable part of the nominal inventory analysed. The instructions focusing on 'problems between people' might be responsible for the frequent occurrence of the role noun *friend*(*s*) and the school location, but they alone cannot explain the rich findings described below.

Genre crucially affected the distribution of RRGns. Age featured only in reference group nouns, which peaked in high school, a time when peer group impact on adolescents is at its strongest, but it did not affect the distribution of role nouns. Modality did not feature at all in either category, except for the high-register nouns. My interpretation is that RRGns are inherent components of both personal-experience narrative content and expository discourse concerning social issues, in ways that override mode of production. Above and beyond their differential statistical distribution, the functions and levels of abstractness of RRGns in the two text types were completely different even when the same nouns were used.

RRGns in narratives. These were the two most frequent noun categories in the narratives, constituting together over a third of all nouns (Table 4). Together they provide two indispensable pieces of narrative information about participants and location (Berman & Slobin, 1994; Hickmann, 2003). Even in the youngest group, role nouns were the preferred mode of reference to specific participants in narratives, labeling people through the external, less individuated layer of their categorical social roles (*counsellor, classmate, teacher*) within the context of the social institutions (*family, school*) where these roles are typically enacted – rather than as specific individuals at the more concrete 1–2 levels. But beyond that, the distribution of RRGns in children's narratives critically differed from that of adolescents and adults in two respects. First, there was a growth in sheer number of different roles and reference groups. The two younger age groups shared a small number (5–6) of roles among them. In contrast, older groups referred to many more (20–40) different roles and locations.

A second interesting change was in actual noun CONTENT, reflecting linguistic and cognitive growth coupled with increasing life experience. Roles in the younger groups were largely members of the child's family (*cousin, mother*) or school life. It was only in the sixteen-year-old group and even more so in the adult group that role nouns diversified to include

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an array of agent nouns (*assembler, bouncers, conscripts, kibbutznik, marketing director, musicians, remedial teacher, junior engineer, supervisor, workmate*), lexically specific and categorical kinship terms (*family member, sister in law*) and people with specific attributes (*aggressive type, extraordinary girl, victim*). This proliferation of advanced-vocabulary role nouns in the adult narratives shows up in the statistical analysis of high-register nouns (Table 5 and Figure 8), and is the only analysis in this category which is affected by modality: high-register role nouns mostly appear in written texts.

Reference group nouns in the nine- and twelve-year-olds were framed by school or home. Stories were repeatedly anchored in the same concrete, narrator-oriented locations, usually labeled in lexically general yet definite noun, taking addressee's familiarity with them for granted (*the classroom, the sports yard*). Few collective nouns (*camps*) were identified with reference groups. In contrast, narratives by older groups referred to an array of lexically specified locations (*club, chemistry lab, communal lavatory*) or to abstract geographic entities requiring a top-down perspective and general world knowledge (*Holland, south part of village, Tel Aviv-center zone*). Many collective categories populated the narratives of older groups (*dance group, orchestra, society*), with diverse lexical labels for groups (*peer group, staff, team, trio*) relating role to reference group (*members of ad-hoc group*). This diversity is reflected in the increase of reference group nouns in high school. Older narratives contained dual reference to the same entity as both a collective noun and a location (*furniture company, office*). As one adult put it *my workplace generally consists of sympathetic and friendly people*.

RRGns in expositories. Despite the thematic coherence in data elicitation, entailed by the same video clip trigger and by the use of 'problems between people' in the instructions for eliciting both narrative and expository texts, *RRGns* differed crucially across the two text types. First, averaged across age groups, they occurred half as frequently in expository compared with narrative texts (Table 4), with middle frequency in expositories, preceded by generic and abstract nouns. In general, role and reference group nouns in expositories are abstract and categorical even in the youngest age group. They interact with other constructions expressing detached stance in this genre, such as complex syntax, passive voice, nominalizations and denominal adjectives, impersonal pronouns, irrealis and non-finite constructions (Berman & Nir-Sagiv, 2004; Ravid, 2004).

Role nouns not only occupy a smaller part of the two categories in the expositories, but also demonstrate a striking qualitative difference. Almost every role noun in narratives stands for a specific person. Role nouns constitute the preferred mode of referring to story participants, anchoring them to their reference groups through their roles and thus identifying them in the unfolding of events. But in all age groups, expository role nouns are

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NON-PERSONAL IN REFERENCE, designating categories of people with distinct social labels by either the categorical plural or the generic singular form. Thus *teacher* or *friend* in expository texts does not refer to any specific person but to a generic teacher or friend or the class of teachers or friends. In line with their categorical, non-personal status, expository role nouns are embedded in irrealis contexts (Reilly, Jisa, Baruch & Berman, 2002).

For example, *kids' parents might be friends too* (nine-year-olds); *it may be the case that the victim is a kid who has no friends for various reasons* (twelve-year-olds); *it's not the kids who are to blame but rather their educator* (sixteen-year-olds); *many employers regard the workplace as more than a place where one makes a living* (adults). In fact, role nouns in expositories are very close to generic nouns (see 4.2.3 below). In terms of Langacker's (1991: 62) notion of 'grain' or 'resolution', what distinguishes role from generic nouns in expository texts is the size and the specificity of the set. Both are generic in reference, but role nouns distinguish finer and more specific and variegated sets than do generic nouns.

Role nouns increase in number and diversity in expositories with age and schooling in much the same way as in narratives. But there are two important differences. First, high-register role nouns occur in expository texts early on, e.g. *new immigrant* and *victim*. Even the ubiquitous *friend* takes on an impersonal, categorial flavour in statements such as *we might lose a good friend*. But expositories by nine- and twelve-year-olds revolve around familiar, concrete roles in hypothetical yet imageable situations (a new boy coming to class, children picking on a classmate), while role nouns in the older groups are embedded in the generalized context of *society* as a whole. They also label less familiar roles that involve experience with social and political issues, such as *Talmudic scholars, employees, philosophers*, and *psychologists*, or abstract roles such as *parties* or *sides* which come close to constituting categories themselves. Second, adolescents and adult expositories markedly prefer to refer to categorical social and affective roles by the high-register conversion of nouns into adjectives (cf. English *the poor*) as in *the jealous* (*one*) *and the hating* (*one*), *the different* (*one*) *and the stranger*, *the elderly*, *the secular, the Ultra-orthodox*.

Reference group nouns designating places and collective entities (*orchestra, society*) constitute a larger category in expositories. In the same way that role nouns are typical of narratives, reference group nouns are the backbone of expository texts dealing with social issues of the type elicited in this study. Reference group nouns in the nine- and twelve-year-olds are the familiar though non-specific and hypothetical settings of *the school, the home*, concrete locations such as *jail*, the generalized *country* or *world*, and generic *every place*. In the older groups, reference group nouns are abstract, collective, yet lexically specific entities such as *the environment, the human race, the media, the parliament, the system*. Sixteen-year-olds and adults

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make explicit use of collective categories such as *generation* or *department* in discussing social issues. And only adults connect role and group reference categories together to indicate their inherent relationship, e.g. *The worker's ability to integrate into the existing workers' community and contribute to it*.

In sum, the qualitative analyses show that RRGns are the privileged modes of reference to narrative participants and expository categories respectively. In fact, RRGns straddle the boundary between Lyon's first and second-order entities by designating both physical and individuated as well as abstract and categorical entities – so that the line separating first and second-order entities is actually permeable. Adequate linguistic and meta-cognitive knowledge about RRGns emerges around 9;0, so that all groups in this study employ them appropriately in their texts. The main developmental changes are in degree of categoriality and abstractness, on the one hand, and lexical specificity, on the other.

Generic nouns

Recall that generic nouns refer to people and things in general (Foley & Van Valin, 1985). In this study, the category also included pronominals such as *each other* or *somebody*. Generic nouns, with non-personal, non-individuated referents such as *people*, constituted the largest category in expository texts (Table 4), in line with the general, categorical stance of expository discourse. They were especially favored in younger-age expositories (half of the nouns in the expositories by nine-year-olds and a third of those in twelve-year-olds were generic) as a bridge to abstractness and categoriality. Generic nouns form large, low-resolution classes with highly general and impersonal, non-lexically specific reference (*adults, girls, human beings*) rendering them both easily accessible to children and easily retrievable in real time in the spoken mode. They thus serve as an interim, almost semantically empty means of conveying abstract, categorical content in the absence of more mature morphological and lexical devices. Yet even here, high-register generic nouns (e.g. *avizarim* 'articles') occur only in written expositories.

Generic nouns highlight the developmental route of embedding expository-like commentary in narratives. Narratives in nine-year-olds used *somebody* to refer to specific peers outside the narrator's personal circle of friends, and a single twelve-year-old observes in the middle of her story about ostracizing a classmate that *since this was 2nd grade and boys were yucky … she had no friends*. But some sixteen-year-olds, whose narratives were less personal than those of the other groups, embedded generic nouns in expository-like commentary in their stories, e.g. *when I arrived at the* [*educational*] *institute as a non-boarder I was not accepted, since the group in the institute is a closed community which finds it hard to accept somebody*

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new. It was only the adults who wove generic nouns into the exposition to their narratives, e.g. *there are many cases of disappointment from people's behavior around you*.

Temporal and event nouns

The next two categories on the Scale, levels 6 and 7, refer to second-order entities designated by semi-abstract nouns which occur or take place in time – temporal and event nouns. Both categories occur more frequently in narratives, which describe how events unfold in time, than in expositories, which are far less dynamic, and the difference is more pronounced in the twelve-year-olds. Again, a qualitative analysis reveals interesting developmental patterns in interaction with genre in both categories, which serve different though related functions.

Temporal nouns anchor narrative events on the (usually past-tense) story-time axis, marking the difference between age groups in their distribution and functions along this axis. A single temporal noun in the youngest narratives marks the triggering event (*on Tuesday a boy from my class broke somebody's arms*) or demarcates the length of the fight (*we made up after one day*), taking either an immediate deictic perspective on time or relating events in direct chronological sequence. In young adolescence, several temporal points designating more complex relationships are marked as events unfold. They anchor the narrative to the narrator's personal timeline, frequently using *grade* as a temporal noun, e.g. *when I was in eighth grade*, sometimes adding temporal commentary linking personal timeline to general time, e.g. *last year* (*in 6th grade*). By adolescence, narratives take a wider, more abstract temporal perspective by enclosing events in a temporal chunk within which events are marked in sequence, e.g. *about six months ago, after a couple of weeks, approximately in the middle of the year*. Older narrators mark multiple points and stretches of time – before and after a high point, e.g. *we did not speak to that boy for almost 3 years, but eventually we made up; three years between 7th and 9th grade*. Older narrators treat time more objectively, e.g. *in 1993 I flew to Holland* (adult); and they take the addressee's viewpoint into consideration, e.g. *when I was in 5th grade, if I remember correctly* (sixteen-year-old). The relative nature of time reference thus provides more mature narrators with multiple viewpoints which are entirely lacking in younger ones.

Event nouns, referring to events with duration, usually constitute the temporal background to narratives. Younger narratives provide limited settings encoded by event nouns, e.g. *game*, *movie, trip*, but from the very start the narrative is referred to in general terms as a *story* with duration – *this story was over* (nine-year-old). As in other categories, age and schooling bring a diversification of event nouns to *battle, lecture, meeting, outing,*

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wedding embedded in complex syntactic constructions with verbs and prepositions denoting duration, for example, *the war took place, throughout that visit, our conversation ended*. Finally, older narrators assign innovative event semantics to non-temporal nominals, e.g. *such an interesting triangle in which I participated took place a couple of years ago*.

Expositories are of course not as dynamic as narratives, and are consequently short on temporals, except for habitual aspect, e.g. *every day, all the time*. But they do refer to abstract temporal units such as *years* and *time* and also to non-specific, general event nouns such as *journey and life* when discussing social and moral issues.

Abstract nouns

The abstract noun categories (levels 8–10), expressing ideas, concepts, processes and states, consisted of the following: (i) imageable abstract nouns (including lexicalized metaphorical expressions) (*hold a*) *rehearsal*); (ii) abstract nouns (*discipline, values*); and (iii) derived abstract nominals (*intervention, loitering*). All abstract categories were more frequent in expositories than in narratives. Together they made up about 50% of the expository nominals, the three most frequent categories in expositories after generic nouns. But narratives too contained over 25% abstract nouns – though RRGns were more frequent, and levels 9–10 were relatively rarer. The higher the degree of abstractness and categoriality of nouns, the more diagnostic they were of the study variables: imageable abstract nouns (level 8) only distinguish expositories from narratives; abstract nouns (level 9) also increase with age and schooling, especially from 12;0 to 16;0; and derived abstract nominals (level 10), in addition, are most numerous in the written expository texts of adults.

The analysis of abstract nominals (ANs) in the context of text production affords a window on children's cognitive, conceptual, and linguistic development, and complements the analyses of the other categories on the Noun Scale. Nine-year-olds hardly use any ANs except for a number of highly lexicalized, imageable, and high-frequency nouns like *have an illness* and *tell secrets* in expositories. This emergent difference between text genres is more apparent in twelve-year-olds, where narratives contain some lexicalized or imageable nominals (*no idea, assignments, scratches*), with a few ANs such as *argument, friendship* and *threats*. But expositories by twelve-year-olds are already rich in level 8 imageable or lexicalized ANs such as *no choice, lack of understanding of the material for the exam, what is the point in being somebody's friend*. They also contain more diverse ANs reflecting a broader range of concepts, e.g. *cause, education, force, language, loyalty, relationship, strike, theft*. As found in previous context-embedded analyses of nominalizations (Seroussi, 2004; Ravid & Cahana-Amitay, 2005), young

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adolescents may produce abstract nominals in syntactically ill-formed or infelicitous NPs, e.g. *self will, to take easy methods*, or else morphologically appropriate yet lexically deviant nominals, e.g. *solving* instead of *solution, learning* for *teaching*. And as found before, abstract nouns are often pluralized to detract from their abstractness and generality, e.g. *blows, curses, copyings, fightings*, *penalties* (Ravid & Avidor, 1998).

Adolescence and adulthood bring about a dramatic increase in the number, content, and diversity of ANs as well as a marked preference for using them in written texts. As noted, narratives in sixteen-year-olds are less specific and reveal few intimate details about their narrators, resulting in more detached and distant discourse stance. Concomitantly, they contain a range of abstract nouns embedded in complex syntactic constructions. Examples include *a gesture of disgust, competitive tension, a certain amount of jealousy, the hatred between the two groups*. Most adults are able to weave derived and abstract nominals skillfully into their narratives where younger narrators would use verbs and adjectives. For example, in a teacher's story about a conflict with a disobedient pupil: *At first I did not let his frequent interruptions disturb me, but with time it became simply impossible to concentrate when Paul's calls and comments echo in class … he demonstrated the devouring of that insect*. Many adult and some adolescent narratives contain expository-like commentary characterized by ANs – again embedded in complex syntactic constructions – e.g. *the classical case is some deep offense whose origin is in a discrepancy in expectations*. But adults are also able to talk and write about highly emotional scenes in terms of abstract and metaphorical concepts and processes. For example, a man tells of a domestic fight *I had to take a bold decision … getting an immediate heart attack due to escalating, anger-induced blood pressure, or being in danger of a multi-level controversy with my wife*; and he advocates *avoidance of a direct stare into the eyes of the adversary when in danger, a speedy flight from direct conflict, and a growth of thick elephantine skin* [sic]. This tendency to deploy ANs instead of verbs and adjectives gives adult narratives – especially those in the written mode – their abstract flavour, despite the intimate character of the stories (Ravid & Cahana-Amitay, 2005).

Expository texts of adolescents, and especially those of adults, carry the signature of abstract, categorical thought. They discuss a variety of issues with social and moral import, from politics and reckless driving to matters of war and peace, clashes within Israeli society, views on educational policy and literacy instruction, and, from a more general perspective, deliberations on relationships between social groups, perspectives on individuals' conduct in society and philosophical discussions of moral controversy. This focus on concepts, ideas and processes results in a tremendous amount of genuinely abstract and highly complex nominals which take up most of the text (as testified also by the preliminary analysis of nominal density and N-Scale

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level above). Although the adults in this study were not language experts or professionals, their written expositories overflow with abstract nominals in heavy NPs with high-register modifications, e.g. *awareness of inter-personal problems, social-psychological assistance, as well as educational effort as early as school age*; or *a system of interpersonal interactions which bring to expression the differences among individuals in society together with the application of each individual and his tendencies in the environment*.

CONCLUSIONS

This study presents a fresh perspective on lexical-semantic development in textual contexts in the school years. The quantitative and qualitative analyses of the Noun Scale across genre and modality demonstrate the firm links between lexical-semantic and cognitive development, on the one hand, and pragmatic factors such as text type, thematic content and social context, on the other. The study points to the discourse-embedded nature of lexical semantics: for example, by throwing light on the development of a classically verbal category like temporality by means of noun reference. The Noun Scale provides a dependable index of noun semantics and constitutes a useful diagnostic tool not only for psycholinguists and child development researchers, but also for clinical and educational practitioners. Finally, although the current study is based on Hebrew data, the Noun Scale is easily applicable to other languages, focusing on semantics and pragmatics rather than language-specific morphology and syntax. Indeed, initial analyses of comparable English data indicate that the same Noun Scale criteria are applicable to English, with similar ranking and distribution across development, genre, and modality.

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