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AFFECT CLASSIFICATION IN THE GERMAN GENDER SYSTEM*

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Gender has traditionally been cited as a paradigm instance of the arbitrariness of language. This paper builds on previous evidence provided by the authors showing that gender classification is not arbitrary in German, but rather forms a complex system based on phonetic and semantic organizing principles. Within the affect lexicon a set of compounds formed with the last member *-mut* is first experimentally evaluated and shown to have *masc*-gender or *fem*-gender assignment depending on the affective Extroversion or Introversion of the noun. The resulting classification is then applied to nouns with the derivational suffix *-nis*, which are shown to have a strong association between *fem*-gender and Introverted affect. Following this the classification is applied to a thorough sample of 177 affect nouns drawn from the entire lexicon. Here there is also shown to be a strong association between *masc*-gender and Extroverted affect, and between *fem*-gender and Introverted affect. An additional group of *fem*-gender nouns expressing arousal is uncovered. Thus the distribution of gender in the general affective lexicon supports the experimental results based on *mut*-compounds. Finally, historical evidence shows that (a) a number of nouns have undergone formal or semantic changes, and (b) a number of borrowed or newly coined nouns have received gender assignments in accordance with the hypothesized affect classification. It is concluded that the semantic organization of gender in the affective lexicon has a prototype structure as depicted e.g. by Rosch (1977).

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1. Introduction

1.

Amidst the reappearance of functional approaches to linguistic theory spearheaded by the interest in communicative function (Diver 1975; Givón 1979; Bates and MacWhinney 1981), Saussure's (1916) dictum that language is a principle of classification has been largely neglected. The functional approach[1] to the study of grammatical structures has led to theoretical grounding and extensive investigation of the communicative and pragmatic functions of case, tense/aspect, determiners, and a variety of other grammatical system types. In this context, the functional motivation for some classes of morphological alternations, loosely referred to as 'classificatory phenomena', has remained relatively opaque. Only the structure of classifier systems (Allan 1977) in languages such as Chinese (Chao 1968) has been subjected to extensive analysis, due primarily to the relative semantic transparency of these systems. On the other end of the spectrum of classificatory phenomena could be placed the conjugational and declensional classes of Indoeuropean languages. The morphological distinctions which form the basis of these verb and noun classes have been standardly treated as morphophonemic alternations devoid of semantic content, in this case due apparently to the lack of any intuitively clear semantic principle of classification. This leaves a rift in the fabric of functional theory: an aspect of the code structure of language which belies functional explanation.

The theoretical treatment of gender classification in some languages seems to place gender toward the latter end of the spectrum of classificatory phenomena. Bloomfield (1933) summarizes the classical structuralist position that:

[1] The term 'functionalism' in linguistics has as many senses as it has users, and so it may be helpful for us to briefly spell out our understanding of the term. On the one hand, it is possible to view language as a closed system governed by structural principles constrained only by logic, and to seek 'explanation' for the organization of the system in the consistency and simplicity of the system itself. On the other hand, it is possible to view language as an open system whose internal organization is less than optimally structured, and which derives its particular organization from its ecological setting: namely, the communicative and interactional functions which it serves, and the full cognitive and physiological makeup of the human user. Such a 'functional' approach seeks explanation for particular linguistic phenomena in the ecological setting of language, i.e. from *outside* the system.

> "... the gender categories of most Indo-European languages ... do not agree with anything in the practical world ... there seems to be no practical criterion by which the gender of a noun in German, French, or Latin could be determined." (pp. 271, 280)

Even at a more recent time, Maratsos (1979), speaking from a psycholinguistic perspective and with full awareness of the thrust of functional thinking, concludes concerning the assignment of gender in German that

> "The classification is arbitrary. No underlying rationale can be guessed at. The presence of such systems in a human cognitive system constitutes by itself excellent testimony to the occasional nonsensibleness of the species. Not only was this system devised by humans but generation after generation of children peaceably relearns it." (p. 235)

From a purely structuralist perspective this point of view is entirely justified: gender assignment can be treated as a purely lexical characteristic of individual nouns, ignoring the apparent morphological classification of nouns into three groups in the lexicon. A functional approach, however, forces inquiry into the possible semantic and psychological bases for this classification. In the most general terms, functional theory points toward the ultimate questions:

(a) *psychological:* How do the speakers of a language go about organizing their knowledge of gender assignment in a language such as German?

(b) *functional:* What role does a classificatory phenomenon such as the gender classification of German play in the communicative function of language? What other functional role might this type of classificatory phenomenon fill in the interplay of cognitive needs of human beings?

The authors (Zubin and Köpcke 1981, 1984a, b, c; Köpcke 1982; Köpcke and Zubin 1983) have begun to develop empirically based answers to the first question. Analysis of the monosyllabic nominal lexicon of Modern Standard German (1450 nouns)[2] has resulted in a set of 15 phonetically based rules, which together with morphological and semantic principles, produces a correct gender assignment for close to 90% of the sample. The pattern of gender assignment is thus shown to reveal a rational but complex system

[2] The monosyllabic lexicon was chosen because it provides a manageable but complete sample, and because monosyllabic nouns have traditionally been cited as the locus of completely arbitrary gender assignment.

based on phonetic, morphological, and semantic factors which in some instances combine to form prototype classes (Posner 1972; Rosch 1977; MacWhinney 1981) and in others conflict with each other to produce apparently arbitrary gender assignments.

The formation of a prototype class is exemplified by the loanword *der Drink* 'alcoholic drink', which manifests the following *masc*-gender[3] determining characteristics:

(a) phonetic: consonant clusters in initial *and* final position;
(b) phonetic: initial cluster *dr-*;
(c) phonetic: final nasal;
(d) morphological: *-s* plural (*masc* or *neut*-gender);
(e) semantic: class of drinkable liquids.

The cumulative effect of phonetic gender-determining factors in a prototype has been empirically demonstrated in a nonce-word test in Köpcke and Zubin (1983). The complex effects of conflict among gender-determining factors are exemplified by *die Vernunft* 'reason (fem)', which obeys a phonetic principle (final non-sibilant fricative + [t] cluster = *fem*) at the expense of a morphological principle (prefix *ver-* = *masc*), while *der Verzicht* 'renunciation (masc)' follows the morphological principle at the expense of the phonetic one.

One of the most general gender-determining principles for German nouns is the Last Member Principle. A conservative estimate based on a random sample of 78 nouns in Duden (1963) suggests that 68% of the recorded nominal lexicon is morphologically complex;[4] that is, on the basis of form

[3] *Masc*-gender, *fem*-gender, and *neut*-gender are used to refer to the *morphological* classification of the nominal lexicon, as marked on the articles/adjectives accompanying nouns (*der*, *die*, *das*, etc.) and on pronouns (*er*, *sie*, *es*, etc.). This is traditionally referred to as 'grammatical gender', as opposed to 'natural gender' which refers to the use of this same morphology to index differences in perceived sex. The ambiguous use of the morphology has led some scholars to speculate about the attribution of sex-specific characteristics to inanimate objects and abstract concepts. It is this confusion and the resulting psycho-dynamic speculation that we specifically wish to hinder by using the above technical terms, rather than 'masculine', 'feminine', and 'neuter'. Those who think they see sex-specific characteristics in words such as *die Sanftmut* 'tenderness' and *die Demut* 'humility' should also consider nouns in the class referring to power and strength: *die Energie*, *die Gewalt*, *die Kraft*, *die Macht*, *die Potenz*, *die Stärke*, *die Wut*, etc.

[4] Duden (1963) says that:

> Die zusammengesetzten Wörter, die im Wörterverzeichnis angegeben sind, sind nur als Beispiele für die Art der Bildung von Zusammensetzungen zu betrachten. Eine auch nur annähernde Erfassung des gebräuchlichsten Wortschatzes ist mit Rücksicht auf die Handlichkeit unseres Buches unmöglich und vom sprachlichen Standpunkt unnötig. (p. xix)

In sum, the actual percentage for complex nouns is much higher than this estimate.

and meaning these nouns can be segmented into two or more parts. In each case it is the final member of the complex unit, whether lexical item or derivational suffix, that determines the gender of the whole unit. For example, *das Mitleid* 'sympathy' has *neut*-gender because of the final noun *das Leid* 'sorrow', while *die Mitleidigkeit* 'capacity for sympathy' has *fem*-gender because of the suffix *-keit*. In view of the generality and rule-like determinism of this principle, occasional exceptions are of particular interest, as they expose the competition with other gender-determining factors. A few examples are:[5]

Morphological competition: der Bereich 'region' and *der Verhaft* 'arrest' have *masc*-gender on the basis of the gender-determining *prefixes be-* and *ver-*, although the last member of the unit has *neut*-gender in the first instance (*das Reich* 'kingdom') and *fem*-gender in the second (*die Haft* 'arrest'). *Das Gesicht* 'face', *das Gespann* 'span of animals', *das Gerinne* 'gutter', *das Gerippe* 'skeleton', etc. have *neut*-gender based on the gender-determining force of the prefix *Ge-*, in spite of the various genders of *die Sicht* 'sight', *der Spann* 'span of animals, foot arch', *die Rinne* 'conduit' and *die Rippe* 'rib'.

Semantic competition: Streichholz 'match', following the Last Member Principle, has *neut*-gender because of *das Holz* 'wood', but in north Germany *Streichholz* is also used with *masc*-gender, possibly because of its membership in two semantic classes associated with *masc*-gender: 'stick-like object' and 'instrumental function'.

Abscheu 'abhorrence' has a *masc*-gender alternant in accordance with its Extroverted affect, to be discussed in section 4, and *Mittwoch* 'Wednesday' has *masc*-gender based on its membership in the paradigm 'days of the week', in spite of the *fem*-gender *die Scheu* 'shyness' and *die Woche* 'week'. *Die Antwort* 'answer' has *fem*-gender in spite of *das Wort* 'word', perhaps because of its membership in a class of speech acts, cf. *die Bitte* 'request', *die Frage* 'question', *die Aussage* 'statement', and *die Lüge* 'lie'.

Other studies (cf. especially Zubin and Köpcke 1984a, b, c) have shown that for a number of noun classes, semantic factors play a strong role in gender assignment, suggesting the following hypothesis:

Hypothesis A: violations of the last-member principle for gender assignment are the consequence of competition with other morphological and semantic gender-determining principles.

[5] Examples of morphological and semantic competition with the (morphological) Last Member Principle are given. Examples of phonetic competition are not expected to exist because morphological principles generally dominate phonetic ones (Köpcke 1982).

In spite of the suggestive force of examples of competition such as those listed above, their occasional and unsystematic occurrence make them equally susceptible to the following hypothesis based on traditional claims about the gender-assignment process:

Hypothesis B: violations of the last-member principle are the consequence of *random* gender assignment in the creation or borrowing of new nouns, or gender assignment determined by *isolated proportional analogy*.[6]

1.1. Mut-*compounds: a class of exceptions to the Last Member Principle*

There are, fortunately, several groups of compound nouns in German which provide an excellent basis for comparatively evaluating these two hypotheses. If these groups of exceptions to the Last Member Principle follow a general morphological or semantic principle, then the stronger Hypothesis A must be accepted rather than the weaker Hypothesis B.[7] One such group is composed of compound nouns with *der Mut* 'courage (masc)'[8] as the last member. Table 1 gives a list of these compounds

[6] Hypothesis B reflects two major trends of thinking about the nature of gender assignment: (1) the synchronic view that no underlying principle can be determined (Bloomfield 1933), and (2) the diachronic view that gender is usually assigned by analogy to phonetic or semantic properties of some specific other noun, but without any principle determining which noun will be picked as the analogical base (Polzin 1903; Duden 1959).

[7] Hypothesis A is 'strong' because it predicts a high degree of general organization, while Hypothesis B is 'weak' because it predicts a lack of organization. The failure to empirically determine organization in the data would favor Hypothesis B, and lead to the rejection of Hypothesis A. On the other hand, an empirically determined high degree of organization in the data does not directly falsify Hypothesis B, but the stronger Hypothesis A would be favored because it provides a principled explanation, while the weaker Hypothesis B offers only a string of unrelated *ad-hoc* explanations.

[8] The meaning of *-mut* in many of these compounds is close to that of English 'mood', to which it is etymologically related, in others its meaning corresponds to *der Mut* 'courage'. In OHG *muot* meant 'mood'; see section 4.2 for details. The present-day *mut*-compounds are, with few exceptions, not the historical continuation of the extensive *mut*-compounds which existed in OHG (Graf 1834 lists 50). They are, for the most part, back-formations from compound objectives with the Last Member *-mutig*, a process which began in the late 17th century (Kluge 1967). The first part of *Demut*, derived from OHG *dio* 'servant', is no longer analyzable. *Armut* is not etymologically a *mut*-compound, but rather a derivation composed of OHG *ar(a)m* 'poor' + *-ōti* '-ful'. The suffix vowel underwent an irregular vowel change *ō* > *uo*, apparently based on an analogy with OHG *muot(i)* > NHG *Mut*. In other words, OHG *armōti* was reanalyzed as a *mut*-compound. Both *Demut* and *Armut* probably continue to be psychologically grouped with the *mut*-compound class, in spite of their morphological opacity.

Table 1
Dictionary entries for the gender of *mut*-compounds. The sample is based on words listed in Mater (1967). – = no word entry; f = *fem*-gender; m = *masc*-gender; m/f = equal alternants; m(f) = primary and secondary alternants. * = uncommon or archiac, and therefore not used in experiment 1 (see table 2).

		Grimm and Grimm (1854-1952)	Schöffler-Weis (1965)	Casell (1964)	Muret-Sanders (1910)	Kluge (1967)	Duden (1963)
Anmut	*gracefulness*	f	f	f	f	f	f
Armut[8]	*poverty*	f	f	f	f	f	f
Demut[8]	*humility*	f	f	f	f	f	f
*Edelmut	*nobleness*	m	m	m	m	m	m
Freimut	*frankness*	m	m	m	m	m	m
*Frevelmut	*wantonness*	m(f)	–	m	m	–	m
*Frohmut	*cheerfulness*	m	–	m	m	m	m
Gleichmut	*equanimity*	m(f)	m	m(f)	m	m	m(f)
Grossmut	*generosity*	f(m)	m	f	f	f	f
*Heldenmut	*heroism*	m	m	m	m	–	m
Hochmut	*arrogance*	m	m	m	m	–	m
*Jugendmut	*pluck, dash*	m	–	–	m	–	–
Kleinmut	*small-mindedness*	m/f	m	m(f)	m	m/f	m
*Langmut	*patience*	f	f	f	f	–	f
Lebensmut	*exhilaration*	m	m	m	m	–	m
*Löwenmut	*lion-hearted courage*	m	–	m	m	–	m
*Mannesmut	*manly courage*	m	–	–	m	–	m
Missmut	*ill humor*	m	m	m	m	m	m
*Opfermut	*unselfishness*	m	–	–	–	–	m
Sanftmut	*tenderness*	f	f	f	f	f	f
Schwermut	*melancholy*	f	f	f	f	f	f
*Todesmut	*grim determination*	m	–	–	–	–	m
Übermut	*bravado*	m(f)	m	m	m	–	m
Unmut	*bad temper*	m	m	m	m	–	m
*Verzweiflungsmut	*desparate courage*	m	–	m	m	–	–
Wagemut	*daring*	m	m	m	m	–	m
Wankelmut	*vascillation*	m(f)	m	m	m	–	m
Wehmut	*sadness*	m(f)	f	f	f	f	f

collected from a variety of dictionaries, along with the gender listed in each dictionary.

The common semantic denominator for the *Mut*-compounds seems to be *Affect*: they all express moods, personality characteristics, or some combination of both. In order to show that *masc* and *fem*-gender words within the group express different types of Affect it will be of great value to empirically demonstrate a reliable correlation between gender and meaning

rather than appealing to intuition, especially in unclear cases. In lexical research it is difficult enough to achieve consensus about concrete lexical meaning. Informal procedures for the Affective lexicon could only produce questionable results. It therefore seems preferable to opt for the Semantic Differential methodology of Osgood et al. (1957) and Hofstätter (1963), the reliability of which has been thoroughly demonstrated in psychological and psycholinguistic research, and which is specifically designed to measure variations in Affective meaning.

Hofstätter (1963) in particular has applied the Semantic Differential to the study of gender semantics. He looked for a semantic effect of the *masc/fem*-gender distinction by having native speakers of German rate the nouns *die Sonne* 'sun (fem)' and *der Mond* 'moon (masc)' on a German Semantic Differential protocol, and by having native speakers of Italian rate the nouns *lo sole* 'sun (masc)' and *la luna* 'moon (fem)' on an Italian translation of the same protocol. The rationale for choosing these nouns, which refer to the same objects but have opposite genders, was that a similar Affective profile for the nouns with identical reference would show that connotation is controlled by lexical meaning, while a similar profile for nouns with the same gender would show affective connotation to be under the control of gender semantics (or in his terms, sex association), to the exclusion of lexical meaning. Hofstätter thus constructed his experiment to pit gender against reference, and found a strong correlation between nouns of like reference, but not between nouns of like gender, in his Semantic Differential profiles. His results seem to speak against our Hypothesis A that a semantic distinction is associated with gender assignment. His method of contrasting gender with reference, however, can lead only to the conclusion that concrete lexical meaning plays a much stronger role than gender in affective association. It cannot be determined from his results whether gender assignment also plays a weaker role under non-contrastive circumstances. Nevertheless, Hofstätter's study does demonstrate the viability of using the semantic differential method for studying affective meaning in the lexicon, and the format of his test will form the basis for our investigation of *mut*-compounds with *masc* and *fem*-gender.

2. Experimental studies of *mut*-compounds

Two steps were necessary in order to evaluate Hypothesis A predicting a semantic correspondence to gender differences in *mut*-compound nouns.

(a) Existing *mut*-compounds had to be collected and their gender determined.

(b) An appropriate semantic differential protocol had to be developed and applied.

A variety of German dictionaries were consulted in order to develop a list of current *mut*-compounds and their genders, as listed in table 1.[8] The collection process aimed at completeness, and thus includes some compounds of low frequency and archaic flavor. The dictionaries (excluding Grimm) consistently list *masc* or *fem*-gender for each compound, except for *Gleichmut*, *Kleinmut*, and *Grossmut*. In contrast with this finding, a pilot experiment with five German speakers revealed considerably more extensive gender variation in the collective linguistic competence of German speakers than is indicated in the dictionaries. We therefore decided to conduct an experimental determination of gender assignment and gender variation rather than depend on dictionary entries because (a) the dictionaries themselves indicate some variance, (b) the dictionaries are committed to a prescriptive stance leading to the concealment of existing variation, and (c) the hypothesis itself makes a survey of actual usage more appropriate than dictionary entries as a data base.

2.1. *Experiment 1: Determination of gender assignment*

Twenty adult university-educated native speakers of German were each given a randomized list of *mut*-compounds and asked to write the appropriate definite article after each word.[9] They were asked to react quickly and spontaneously, but were not placed under time pressure. A number of infrequent compounds from table 1 were removed from the list to make the test more compact, and to avoid confusion produced by unfamiliar nouns. The test resulted in the distribution of gender assignments given in table 2.

Table 2 reveals a much greater amount of variation in gender assignment than did the dictionaries. There was at least some variation among the 20 speakers for 13 out of 17 nouns, while the dictionaries, taken collectively, suggest variation for only three out of 28 nouns. The dictionary comparison does substantiate the experimental findings to the extent that the three nouns with variable gender in table 1 (*Gleichmut*, *Grossmut*, *Kleinmut*) correspond to nouns in table 2 with the greatest gender variation: they all fall in the middle third of the rank order. On the other hand, the variable gender for three further nouns in the middle of the rank order in table 2 (*Freimut*, *Missmut*, *Schwermut*) is not suggested by the dictionaries at all, leading to the conclusion that the method used in experiment 1 produces results which are consistent with normative assessments but which are more

Table 2
Tendencies in gender assignment to *mut*-compounds by native speakers of German, in order of increasing *fem*-gender tendency. Fractions give the proportion of *fem*-gender assignment over the total *masc* + *fem*. There were no *neut*-gender assignments. The affective characteristics Aa Bb Cc Dd are defined on p. 51. Parentheses mean that a characteristic is only weakly present.

		Gender assignment		Proportion	Affective
		masc 'der'	fem 'die'	of fem-gender	characteristics
Lebensmut	*exhilaration*	20	0	0	A
Übermut	*bravado*	20	0	0	A
Wagemut	*daring*	19	1	0.05	A
Hochmut	*arrogance*	18	2	0.10	ABCD
Unmut	*bad temper*	17	3	0.15	(A)BC
Wankelmut	*vascillation*	17	3	0.15	(c)D
Kleinmut	*small-mindedness*	16	4	0.20	aBCD
Freimut	*frankness*	15	5	0.25	A(b)(c)
Missmut	*ill humor*	14	6	0.30	BC
Gleichmut	*equanimity*	11	9	0.45	(b)(C)
Grossmut	*generosity*	8	12	0.60	Abc(d)
Schwermut	*melancholy*	4	16	0.80	ab(C)
Sanftmut	*tenderness*	3	17	0.85	abc(d)
Demut	*humility*	1	19	0.95	abcd
Wehmut	*sadness*	1	19	0.95	abc
Anmut	*gratiousness*	0	20	1	bc
Armut	*poverty*	0	20	1	(a)(c)

sensitive to variation in actual use. Implicit in table 2 is the fact that not one speaker produced a single *neut*-gender response. This means that although the speakers produced *masc*/*fem*-gender variation, often in contradiction to the normative dictionary assignments, there was no uncertainty concerning the exclusion of *neut*-gender. Since the gender morphology under study is also used to express the distinction between male and female sex, it was extremely important to compare the test protocols from male and female speakers to see whether the results were biased by sex. A separate tabulation of the results in table 2 for male and female speakers showed that the rank order of gender assignment to *mut*-compounds remained the same. Furthermore, table 3 shows that individual speakers varied considerably in the number of *masc* and *fem*-gender assignments they made, but that this variation was not at all sex specific. Male and female speakers, taken as groups, showed nearly the same distribution of gender assignment tendencies, and the same average. Thus the sex of the speakers did not produce a noticeable difference in gender assignment.

Table 3
Distribution of gender choices for male and female speakers.

	Number of nouns, out of the set of 17, for which speakers gave a *masc*-gender assignment						
	1–3	4–6	7–9	10–12	13–15	16–17	average
Male speakers (N = 9)	0	2	3	3	1	0	9.2
Female speakers (N = 11)	0	1	5	4	1	0	9.2

Cursory inspection of the glosses for *mut*-compounds in table 2 shows that each compound has a specific lexical meaning, and that these meanings are widely divergent. Hypothesis A, however, claims that there will be some common semantic factor corresponding to their gender assignment. An examination of words near the top and the bottom of the rank order indeed does suggest one, which for the sake of succinctness we will label *Extroversion* and *Introversion*. We stress at the outset that these terms are provisional labels whose content should be understood in the specific sense developed below. The semantic content of such dimensions underlying the lexicon must be technically describable, but may be ultimately unnameable.

The basic dynamic, as we see it, has to do with the locus of control between the self and the outside world. Words near the top of the list in table 2 all seem to suggest types of conduct or attitude which are directed toward controlling the outside world or view it as controllable, or which protect the self from outside control. In contrast, words near the bottom of the rank order suggest conduct or attitude which place the self under outside control or view it as controllable, or which open the self to outside influence. The following concepts, given in German with their approximate English translations, give more substance to the affective domain which we characterize as *Introverted-Extroverted*:

	Extroversion		*Introversion*		
A	offensiv	aggressive	submissive	fügsam/ gefügig	a
B	abweisend	rejecting	accepting	aufnehmend	b
C	verschlossen	remote	accessible/ vulnerable	zugänglich/ verletzlich	c
D	eigennützig	selfish	altruistic	selbstlos	d

The labels 'Introversion' and 'Extroversion' will be used throughout the paper as cover terms, and should be interpreted in view of the four content categories given here. Capital and small letters are used in table 2 and in the appendices as a guide to the specific sense in which specific affect terms convey Extroversion or Introversion. Parentheses are used when the specific characteristic is only sometimes, or only weakly present.

In table 2 the *mut*-compounds near the top of the rank order nearly all convey aggressive affect in addition to other Extroverted characteristics, those near the bottom nearly all convey submissive affect, in addition to other Introverted characteristics. Of particular interest are the terms in the middle of the rank order, those which showed significant gender variation in Experiment 1. Five of these (*Freimut*, *Gleichmut*, *Grossmut*, *Kleinmut*, and *Schwermut*) contain in differing degrees a mixture of Introverted and Extroverted affect. In the middle of the rank order with nearly even gender variation is *Gleichmut*, which conveys an affect midway between Introversion and Extroversion, except for slight tendencies toward 'accepting' (Introversion) on the one hand, and toward 'remote' (Extroversion) on the other. The close correspondence between degree of Introversion/Extroversion and proportion of *masc*/*fem*-gender leaves little room for doubt about the semantic control of gender assignment for *mut*-compounds. A weakness in the argument, however, is that the definition for Introversion and Extroversion remains subjective.

These concepts, taken as a global affective polarity, can be motivated in two ways that go beyond a subjective definition. Firstly, investigations into the psychology of personality[10] have shown Introversion and Extroversion to be dominant and relatively stable characteristics of human personality; thus our use of these terms can be thought of as labels for a distinction in the organization of personality. Secondly, an operational definition for

[9] There were four randomizations. Comparison of the results did not reveal any consistent effect produced by the order in which nouns were given.

[10] Jung (1922), Rorschach (1922), Eysenck (1953), and Cattell (1965) developed major theories about personality which point to Introversion/Extroversion as an important factor. Feshbach and Weiner (1982) in their textbook on personality state that:

"introversion-extraversion may be the most genetically influenced of the personality traits. Introverts are defined as quiet, retiring, introspective, and not very socially active. Extraverts, on the other hand, are characterized as being outgoing, impulsive, and uninhibited, having many social contacts, and frequently taking part in group activities" (p. 40).

"The extravert's energy is directed toward external objects and events, while the introvert is more concerned with inner experiences. ... There is a substantial amount of empirical evidence indicating that extraversion-introversion is indeed a significant personality dimension" (p. 107).

Introversion-Extroversion can be constructed by substituting, for the four subjective categories given above, a family of affective concepts which are more primitive, more concrete, and more widely distributed in the lexicon. We have in mind such concepts as are connotatively conveyed by the polar adjectives in table 4.

Before proceeding to an empirical test of the Introversion-Extroversion polarity we would like to emphasize that there is no necessary theoretical association whatever between this concept and evaluative judgements such as 'good' and 'bad' on the one hand, or sex-specific behavior on the other. The extent to which a specific noun such as *Anmut* 'graciousness' is thought of as a 'female' characteristic, or *Wagemut* 'daring' as a 'male' characteristic is a reflection of German cultural attitudes, and is not necessarily related to the Extroversion–Introversion concept as a whole, nor to the overall organization of gender assignment. Indeed, *die Schwermut* 'melancholy (fem)' and *der Unmut* 'bad temper (masc)' can be predicted equally easily of men and women without evoking a sex-specific association. It may well be that, in a traditional sense, the characteristics 'aggressive', 'rejecting', 'remote', and 'selfish' are associated with male behavior, and the characteristics 'submissive', 'accepting', 'accessible/vulnerable', and 'altruistic' with female behavior. We wish to stress, however, that the thesis developed in this paper need not be based on a tie to sex-specific associations. Indeed we believe that the Introversion–Extroversion affective polarity goes much deeper, both historically and psychologically, than present-day attitudes about sex-specific behavior.

2.2. *Experiment 2: Semantic differential validation of Introversion–Extroversion as a semantic principle controlling gender assignment to* mut-*compounds*

On the basis of the subjective categorization into *Introversion* and *Extroversion* we now formulate the following hypothesis, based on Hypothesis A, as a first step toward an empirical comparison of Hypotheses A and B:

Hypothesis A1

(i) *Mut*-compounds with primary *fem*-gender assignment will correlate with an empirical measure of *Introversion*.

(ii) *Mut*-compounds with primary *masc*-gender assignment will correlate with an empirical measure of *Extroversion*.

(iii) *Mut*-compounds with mixed gender assignment will correlate with neither *Introversion* nor *Extroversion*.

Since Introversion and Extroversion as labels for technical concepts might lead to intellectual rather than affective judgements, and since native speakers might have varying interpretations for these terms, it became necessary to develop a test for specific affective associations which suggest this dichotomy. To do this, a selection was made from the adjective scales of the German semantic differential in Hofstätter (1963). The number of adjective scales was reduced from 24 to 15 in order to eliminate scales which seemed unlikely to reflect Extroversion–Introversion, and to reduce the test time. In addition, the number of *mut*-compounds to be tested was reduced to six: two each from the top, middle, and the bottom of the rank order in table 2.[11] This resulted in a total of 90 separate judgements which took a maximum of 20 minutes to complete.

Testing procedure

Forty native speakers (university students) from northern Germany participated in experiment 2. Each received a test booklet which had, on each of the six pages, one *mut*-compound followed by a series of fifteen adjective scales such as the following:[12]

hoch ('high')	□□□□□	tief ('low/deep')

All individual adjective scales are listed in table 4.

In accordance with semantic differential methodology, the speakers were asked to rate each 'concept' (*mut*-compound) on the 15 scales, marking

[11] The criteria for the selection of *mut*-compounds from table 2 for experiment 2 were:
(a) for *masc*-gender nouns: near categorical *masc*-gender assignment and familiarity, based on frequency (this eliminated *Lebensmut* and *Wagemut*);
(b) for *variable*-gender nouns: most evenly balanced variation in gender assignment;
(c) for *fem*-gender nouns: near categorical *fem*-gender assignment and morphological analyzability (this eliminated *Demut* and *Armut*).
Male-female was not selected as a scale. Because of the natural gender categorization of human beings, the respondents could easily have used the association *fem*-gender = female and *masc*-gender = male in rating the nouns, not only making the results of this scale worthless, but possibly contaminating the interpretation of the other scales as well.

[12] The five-point scale replaces the standard seven-point scale because it has been found to simplify the task without markedly reducing the sensitivity of the test.
All aspects of the test materials were randomized: the order of concepts (six different orders), the order of the adjective scales (four different orders) and the left–right polarity of the scales (two different directions). This removed, or at least reduced, the potential for experimenter-induced and sequence-induced bias.

Table 4
Average SD rating for *fem*, *variable*, and *masc*-gender *mut*-compounds on each adjective scale. The scales are ordered left to right in accordance with their correspondence to the Introversion–Extroversion polarity. The possible range of ratings is 1–5.

	Average rating			Validation[a]	
	fem	variable	masc	1	2
tief-hoch *deep/low-high*	2.5	3.2	3.8	+	+
glatt-rauh *smooth-rough*	2.6	2.4	3.0	+	−
verschwommen-klar *fuzzy-clear*	3.0	3.3	3.8	+	+
warm-kalt *warm-cold*	2.2	2.8	3.4	+	+
klein-gross *little-big*	3.0	3.4	3.8	+	+
sanft-wild *mild-wild*	1.6	2.3	3.9	+	+
passiv-aktiv *passive-active*	2.2	2.9	4.3	+	+
schwach-stark *weak-strong*	2.6	3.7	3.2	+	−
schön-hässlich *beautiful-ugly*	2.0	2.6	3.3	+	+
traurig-froh *sad-happy*	2.4	3.3	3.6	+	+
leise-laut *soft-loud*	1.6	2.4	4.3	+	+
rund-eckig *round-jagged*	2.2	2.6	3.3	+	+
gelöst-gespannt *relaxed-tense*	2.7	2.2	3.4	+	−
feucht-trocken *damp-dry*	2.7	3.2	3.2	+	0
stetig-veränderlich *steady-changeable*	2.8	2.7	3.3	+	−
Average	2.4	2.9	3.5	+	+

[a] *Validation 1:* (+) means that the average rating for *fem*-gender nouns is lower on the Extroversion scale than for *masc*-gender nouns, in accordance with Hypothesis Ai and ii. A (−) would mean that the *fem*-noun rating was higher.
Validation 2: (+) means that *variable*-gender nouns lie *between fem* and *masc*-gender nouns on the Extroversion scale, in accordance with Hypothesis Aiii. A (−) means that the *variable*-gender nouns do not have an intermediate rating, and (0) means this text was indeterminate.

the extreme left or right-hand box if that adjective had 'unequivocal validity' for the concept, the inner left or right-hand box if that adjective was 'somewhat appropriate', and the middle box for 'no association in one or the other direction'. The speakers were not placed under time pressure, but were asked to react spontaneously.

The average rating on each adjective scale for *fem*, *variable*, and *masc*-gender words is given in table 4. Two separate sets of observations tend to confirm Hypothesis A1 (systematic, semantically motivated gender assignment) and disconfirm Hypothesis B (isolated or random gender assignment):

Validation 1 (table 4): *fem*-gender nouns were rated lower on each of the adjective scales than were the *masc* nouns, i.e. *fem* nouns were rated as more Introverted, and *masc* nouns as more Extroverted. Furthermore, the *fem* nouns were all rated on the Introversion half of all the scales (1–3), while the *masc* nouns were all rated on the Extroversion half (3–5) with no overlap. This reveals an absolute, and not merely a relative tendency

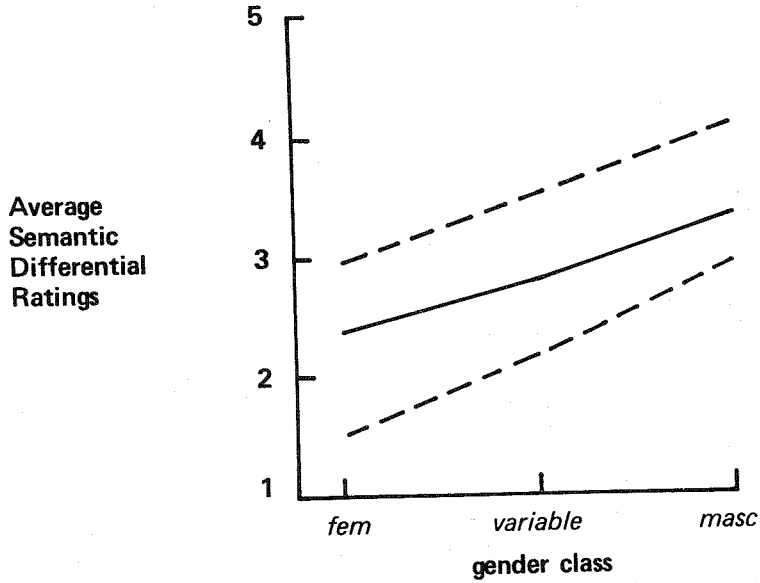

Fig. 1. Average SD ratings for *mut*-compounds on all adjective scales taken together, yielding a global 'Extroversion' rating. The solid line gives the average global rating, the dashed lines give the maximum and minimum ratings on individual adjective scales. The scale (1–5) moves from maximum Introversion to maximum Extroversion.

to consider *fem*-gender *mut*-compounds to express Introversion and the *masc*-gender ones to express Extroversion.

Validation 2 (table 4): The variable-gender words were consistently rated as being intermediate on all but four of the adjective scales. The statistical probability that either of these two distributions could occur by chance is quite small ($p < 0.005$ Sign test). Finally, the summary average rating given at the bottom of table 4, and the rising monotonic curve of figure 1, show that the tendency to rate *fem*, *variable*, and *masc*-gender nouns as Introverted or Extroverted is in exact accordance with Hypothesis A1.

Table 5
The average SD rating for each *mut*-compound by male speakers, by female speakers, and by all speakers together. Possible range = 1–5.

		Average rating		
		female speakers	male speakers	all speakers
Fem-gender nouns	Anmut	2.4	2.5	2.5
	Wehmut	2.4	2.4	2.4
Variable-gender nouns	Gleichmut	2.6	2.7	2.7
	Grossmut	3.1	3.2	3.2
Masc-gender nouns	Hochmut	3.7	3.6	3.6
	Übermut	3.4	3.5	3.4

Table 5 gives the average Semantic Differential rating separately for each word, and for male and female speakers. The ratings for the two *fem*-gender words are quite close (2.5 and 2.4), as are the ratings for the *masc*-gender words (3.6 and 3.4). For both *variable*-gender nouns the ratings are intermediate between the ratings for *masc* and *fem*-gender words, in accordance with Hypothesis (A1iii), but they do reveal considerable variation (2.7 vs. 3.2). Particularly noteworthy is the fact that *Grossmut* is rated as more Extroverted than *Gleichmut*, while in table 2 *Grossmut* is slightly more likely to be assigned *fem*-gender (0.60) than is *Gleichmut* (0.45), i.e., *Grossmut*, compared to *Gleichmut*, curiously shows a slight tendency to Extroversion and *fem*-gender. This cross-over could be taken as evidence of a faulty hypothesis, or may only be a sign of uncertainty in judgement-making. It may be useful to stress here that 'variable gender' is *not* a gender category, but rather a group of nouns for which gender assignment is highly variable, suggesting that they fall between the centers of the semantic categorization. Furthermore, the middle of the Semantic Differential scale reflects a judge-

ment that the affective connotation of *neither* adjective of a pair is particularly appropriate. At the boundary between the centers of a categorization it is no surprise that judgements should be highly variable, allowing the possibility that with a limited number of speakers and adjective pairs the judgements could appear to go slightly in the wrong direction. Thus the variability of judgements for *variable*-gender nouns, rather than lessening the validity of the hypothesis, tends to confirm the hypothesis that *masc* and *fem*-gender nouns lie at the centers of a semantic categorization, while *variable*-gender nouns lie at the boundary.

The ratings for male and female speakers in table 5 are surprisingly close, and do not show even a slight overall trend. In one specific instance women rated the noun *Übermut* as being 'strong' (4.4), while men rated it as being 'weak' (1.4). This one instance of sex-specific judgement shows that speakers were reacting spontaneously, and within the intuitive boundaries of sex-roles. Nevertheless, all other judgements showed little or no sex-specific variation. This fact, taken together with the lack of sex-specific variation in gender assignment (table 3) strongly suggests that the semantic categorization behind gender assignment is rooted in an abstract, socialized linguistic competence, and is not an artifact of sex-specific role associations.

2.3. Experiment 3: Validation for the polarity of individual adjective scales in experiment 2

The hypothesis that *fem*-gender *mut*-compounds suggest Introversion in their semantic content, and that *masc*-gender compounds suggest Extroversion has intuitive appeal, an appeal that was given empirical substance with the Semantic Differential test of experiment 2. However, the design of this test itself incorporated a series of intuitive judgements resulting in the decision to order each adjective pair one way, and not the other. The decision to categorize *wild* ('wild') for example, as Extroverted, and *sanft* ('mild') as Introverted has immediate intuitive appeal, but this nevertheless remains a subjective judgement on our part. In experiment 3 therefore, we carried out two sorting tests to determine the reliability of these intuitive judgements. Each pair of adjectives as written on a card, one at the top and one at the bottom, and each adjective written both right side up and up side down, so that the 15 cards, like playing cards, had no inherent vertical orientation. In experiment 3a, ten respondents were asked to arrange the 15 cards so that the adjectives which 'fit best together as a group' would be lined up parallel at the top or the bottom of the cards. Respondents were

Table 6
Results of the sorting tests with the adjective pairs from table 4. Entries give the proportion of ten subjects who agreed with our predictions.

	A Free sorting task	B Controlled sorting task
tief–hoch	0.7	1.0
glatt–rauh	0.9	0.8
verschwommen–klar	0.6	0.9
warm–kalt	0.9	1.0
klein–gross	0.9	1.0
sanft–wild	1.0	1.0
passiv–aktiv	0.7	1.0
schwach–stark	0.6	1.0
schön–hässlich	1.0	1.0
traurig–froh	0.7	0.9
leise–laut	1.0	1.0
rund–eckig	1.0	0.9
gelöst–gespannt	0.9	0.9
feucht–trocken	0.7	1.0
stetig–veränderlich	0.3	0.6
Average	0.79	0.93

allowed to sort and resort the cards until they were satisfied with the arrangement. The results, given in table 6, column A, show that ten respondents tended to sort together those adjectives which we had grouped together in experiment 2, on the average 0.79 of the time. In other words, they felt that these adjectives tended to fit together as manifestations of some concept without a concrete statement of what the concept was. The only exception was *stetig–veränderlich*, which was sorted in the opposite direction by seven of the ten respondents. A comparison with table 4 shows that two of the adjective scales which did not confirm our hypothesis under validation 2 also showed strong disagreement on the sorting test: *stetig–veränderlich* and *schwach–stark*.

In experiment 3b, the same ten speakers were asked to sort the 15 cards again, this time arranging them so that the adjectives best representing the concept 'Introversion: an attitude or feeling directed inward' would be arranged together and the adjectives best representing 'Extroversion: an attitude or feeling directed outward' would also be arranged together. The results, given in table 6, column B, show that when given the specific semantic distinction we used to construct experiment 2, the ten speakers

overwhelmingly tended to produce the grouping of adjectives that we had used, on the average 0.93 of the time. Particularly interesting is the fact that four of the ten deviating responses were produced by one respondent. It is possible that this individual has a differently organized affective field, with correspondingly different tendencies in gender assignment.

Thus experiment 3 helps to remove doubts about the reliability and validity of the operational definition which we gave for Introversion and Extroversion in terms of the oppositional grouping of 15 polar adjective pairs. The ten speakers agreed with our polar orientation of the adjectives, especially when Introversion–Extroversion was given as an organizing principle. Experiment 3 thus removes the most serious reservations about experiment 2 by showing that the operational definition for Introversion–Extroversion has concept validity and reliability across speakers.[13]

2.4. *Alternative explanations for the distribution of gender with* mut*-compounds*

The successful validation of Hypothesis A1 has already excluded Hypothesis B, that the distribution of gender with *mut*-compounds could be due to random gender assignment. Three further possibilities remain:

Hypothesis C1: gender assignment is based on the historical gender assignment of two separate nouns, OHG *muot* and OHG *muoti*.

Three facts speak against this hypothesis. First, while *muoti* had *fem*-gender, *muot* had all three genders in compounds. Furthermore, some compounds did not have the same gender as the corresponding compounds in NHG:

[13] For the sake of argument, let us suppose that the results of experiment 3 are invalid, and that there is no common semantic factor behind the affective connotations of the adjective pairs in experiment 2, or at least that there is no one factor, but a large number of semantic factors which intersect and overlap in a complex way. For this possibility we make the assumption that the adjective pairs are conceptually independent of each other. Although we can no longer predict that a *masc* or a *fem*-gender *mut*-compound will be rated high or low on any particular adjective scale, we can still predict that the variable-gender nouns will fall *between* the *masc* and the *fem*-gender nouns on each of the scales. Validation 2 in table 4 shows this to be true in ten out of 14 cases, with one case being indeterminate. A sign text shows the probability of this happening by chance to be less than 0.004. Even the extremely conservative assumptions made in this test show that with high statistical reliability there is some sort of conceptual organization behind the assignment of gender to *mut*-compounds, even if it may not be some monovalent semantic factor such as the Introversion/Extroversion factor that we have extracted.

for example, *hohmuoti* (Hochmut), *ubarmuoti* (Übermut) and *missimuoti* (Missmut) all had *fem*-gender (Graf 1834). Finally, NHG *mut*-compounds, with few exceptions, are not true etymological reflexes of the OHG compounds at all (see fn. 8).

Hypothesis D1 : NHG *-mut* in compounds is a homonym with the meanings 'courage' and 'state of mind', corresponding to *masc*-gender and *fem*-gender, respectively.

This hypothesis suggests that our respondents in experiment 1 examined each compound for an underlying sense 'courage' or 'state of mind', and then made a gender assignment accordingly. If we sort the compounds in table 2 on this basis, we arrive at the following distribution :

'courage'	*'state-of-mind'*	*both/neither*
Lebensmut	Hochmut*	Kleinmut
Übermut	Unmut*	Freimut
Wagemut	Wankelmut*	Anmut
	Missmut*	Armut
	Gleichmut	
	Grossmut	
	Schwermut	
	Sanftmut	
	Demut	
	Wehmut	

The sorting shows that hypothesis D1 makes the wrong prediction for four nouns (marked with *), and further leaves the substantial gender variation of *Gleichmut* and *Grossmut* unexplained.

Hypothesis E1 : Recent compounds with *-mut* have *masc*-gender, old compounds have either *masc*- or *fem*-gender.

The fact that a number of *fem*-gender *mut*-compounds, including *Schwermut*, *Sanftmut*, and *Wehmut*, are no older than early NHG speaks against the validity of this hypothesis, which in any case cannot account for the gender assignment of older compounds. It does, however, seem to bear more interestingly on the 18th/19th century stand of *mut*-compounding, as reported in Grimm and Grimm (1854-1952) and Sanders (1876). At that time there

were many newly-formed *mut*-compounds, all with *masc*-gender, and some with Introverted affect. These include:

Introverted masc-*gender* mut-*compounds in the 18th/19th centuries*

der Hasenmut	"rabbit-mut"	'cowardice'
der Hundemut	"dog-mut"	'slavishness'
der Trauermut	"mourning-mut"	'sadness'
der Reumut	"repentance-mut"	'regret'
der Schwachmut	"weak-mut"	'disheartedness'
der Weichmut	"soft-mut"	'mildness'
der Zagemut	"timid-mut"	'timidity'
der Zweifelmut	"doubt-mut"	'tendency to hesitation'

It appears that compounding with *-mut* was fairly productive at that time (72 listed) and followed the Last Member Principle for gender assignment. Quite recently this compounding has become unproductive. During the ensuing loss of compounds some of the more newly formed Extroverted ones, such as *der Lebensmut* 'exhiliration' have been preserved, while *all* of the compounds with Introverted affect and *masc*-gender listed above have been lost. In other words, the creation and loss of *mut*-compounds during the last several hundred years has led to a distribution of gender entirely in accordance with the Introversion–Extroversion principle of Hypothesis A1. The presence of such historically integrative changes in the affect lexicon at large will be taken up in section 4.2.

In sum, the experimental studies have shown that *mut*-compounds are subject to extensive gender variation, and that the tendency toward a *masc*-gender or a *fem*-gender assignment correlates closely with an affective polarity which we have labeled Extroversion–Introversion. This finding is in itself important counterevidence to the claim that gender assignment is arbitrary, but it would have limited general value to a theory of categorization in language if it applied only to this minute portion of the lexicon. There are, however, other groups of complex nouns which violate the Last Member Principle, and which to some extent intersect with the general semantic area of attitudes and feelings. Two of these groups are formed with the derivational suffixes *-nis* and *-sal*. In the following section we will extend the results of the experimental study of *mut*-compounds to these two sets.

3. Derived nouns with the suffixes *-nis* and *-sal*[14]

These nouns appear to be sensitive to the semantic classification investigated in experiments 1–3 to the extent that the meanings of *fem*-gender nouns in the groups have a strong link to Introverted affect. The remaining nouns, however, have *neut*-gender, suggesting a combination of morphological and semantic principles for gender assignment, a point which will be picked up again in section 5.

Of the 67 nouns in Mater (1967) with the derivational suffix *-nis*, 34 have *neut*, 30 have *fem*, and three have *variable*-gender, a nearly equal distribution of gender in violation of the Last Member Principle, suggesting the possibility of arbitrary gender assignment (see appendix A for the complete sample). An examination of the *fem*-gender words, however, shows that 14 clearly convey Introverted feelings or mental states in the sense defined by the Semantic Differential scales of table 4. These include *die Trübnis* 'misery', *die Kümmernis* 'grief', *die Bängnis* 'anxiety', and *die Besorgnis* 'fear'. Another five nouns, including *die Empfängnis* 'conception' and *die Finsternis* 'darkness, obscurity', convey non-mental states which nonetheless correspond to many of the Introversion polar adjectives of table 4, and as such would fall into a wider class of concepts with Introverted affective associations. The remaining 11 *fem*-gender nouns, including *die Erlaubnis* 'permission' and *die Kenntnis* 'knowledge' do not have strong affective associations of the Extroversion–Introversion type, so that their gender cannot be explained on this basis. Whether or not their *fem*-gender assignment corresponds to other semantic classifications is a topic for further investigation.

Of the 34 neuter nouns, *none* express Introverted emotions or mental states. These include *das Ergebnis* 'result', *das Ereignis* 'occurrence', *das Gleichnis* 'simile', and *das Verzeichnis* 'catalog'. Some express activities which, if affectively classified, would correspond rather to Extroversion: these include *das Zerwürfnis* 'quarrel', *das Wagnis* 'risky undertaking' (cf. *Wagemut* in table 1), and *das Gelöbnis* 'solemn vow'. A number of *neut-*

[14] In OHG *-nis* was a *neut*-gender suffix with the forms *-nassi*, *-nessi*, *-nissi*, and *-nussi*, and also a *fem*-gender suffix with the forms *-nissa* and *-nissī*. With the collapse of the final vowels in MHG, the words with these endings went into a period of extensive gender variation. This suffix was quite productive into the 19th century, especially in Heinrich Heine's writing. In similar fashion, *-sal* originated as the AHG suffixes *-sal* (neut) and *-sala* (fem). With the collapse of the final vowel these nouns also went into a period of extensive gender variation. Thus the present gender of these two classes of derived nouns cannot be attributed to an historically constant, morphologically determined assignment.

gender nouns in this group, such as *das Verhängnis* 'fate, destiny', might seem to have an association of Introversion. But close analysis shows these nouns to refer, not to affective states, but to *external circumstances* which can produce both Introverted and Extroverted affective states. *Das Hemmnis* and *das Hindernis* 'obstruction, hindrance, impediment' can produce either an Introverted feeling of *inhibition*, or an Extroverted response of *aggression*. A similar correspondence to both Introverted and Extroverted feelings exists for *das Verhängnis* 'fate' and *das Bedürfnis* 'requirement, need, lack'. *Das Ärgernis* 'annoyance, scandal' corresponds only to an Extroverted mood of *irritation*. These *neut*-gender nouns thus do not convey, and are not even invariably associated with Introverted affect.

Of particular interest for the semantic distinction between *fem* and *neut*-gender nouns is the semantic status of the three nouns with variable gender. *Die/das Versäumnis* 'neglect, omission' and *die/das Säumnis* 'slowness, negligence, delay' have a range of meaning which centers on the fact that something is not done (without affective implications), but can also connotatively suggest an Introverted affective disposition which leads to negligence. *Die/das Beschwernis* has two closely related meanings conveyed by 'complaint': on the one hand, a pain or hurt feeling (Introverted affect); on the other, a protest against something (if any affect, then Extroverted). Thus the meanings of all three nouns with variable gender have a connotative range which includes Introversion on one side, and excludes it on the other, a semantic diversity corresponding eactly to their variable gender assignment. Table 7 summarizes the distribution of gender assignment for *-nis* derivations.

Table 7
Gender assignment and affective connotation of complex nouns with the suffix *-nis*. The sample is listed in appendix A.

	Affective connotation				
	Introverted affective state	Introverted association	Ambiguous	Extroverted association	No affect
Fem-gender	14	5	0	0	11
Variable-gender	0	0	3	0	0
Neut-gender	0	0	1	7	26

The correspondence between *fem*-gender and Introverted affect holds equally true for the nine complex nouns formed with the derivational suffix *-sal*. Four, including *die Trübsal* 'misery', have either *fem*-gender or vary

between *fem* and *neut*-gender, and have meanings which correspond in varying degrees to Introversion. The other five, such as *das Schicksal* 'fate', have *neut*-gender and are unrelated to Introversion (see appendix A for the complete sample).

The pattern of gender assignment for derived nouns with the suffixes *-nis* and *-sal* thus corroborates the experimental results for *mut*-compounds in two ways. Firstly, *-nis* and *-sal* derivations which clearly convey Introverted affect have *fem*-gender. Secondly, variable gender occurs precisely for those *-nis* derivations which only partially fit the semantic categorization, a fact which corresponds exactly to the intermediate rating of those *mut*-compounds with variable gender. These findings give added support to Hypothesis A: that gender assignment is under the control of a semantic principle whenever the Last Member Principle fails to operate; and more specifically to Hypothesis A1: that one of these semantic principles is the Introversion–Extroversion polarity. In the next section we will apply this polarity to an extensive sample of affect nouns drawn from the lexicon at large.

4. Affective cognitive states: the affect lexicon at large

Up to this point the principle of semantic classification has been discussed in its secondary role to the Last Member Principle. Other studies (especially Zubin and Köpcke 1984a, b, c) suggest that semantic classification can be a strong gender-determining principle. The class of drinkable liquids, for example, has *masc*-gender, with high productivity for names of particular drinks.[15] In light of the cognitive prominence of semantic classification for gender assignment it should be suspected that the Introversion–Extroversion distinction would not be limited to the classes of complex nouns previously discussed, but rather might have at least some effect on gender assignment in the affective lexicon at large. Indeed, a finding that this affective-semantic distinction exerts its influence on gender assignment to all nouns that come within its semantic domain should have profound implications for a theory of language as a classificatory system. A thoroughgoing experimental validation of this possibility lies beyond the scope of this paper. However, we will venture to make a systematic categorization of nouns referring to affective cognitive states (emotions and personality

[15] There are two productive subclasses: a *fem/neut*-gender class of sparkling drinks, and a *neut*-gender class of beers, as well as *die Milch* (fem) 'milk' and *das Wasser* (neut) 'water', whose gender anomaly mark their status in the core lexicon (Zubin and Köpcke 1984a, b, c).

characteristics) to assess the viability of extending the Introversion–Extroversion hypothesis to gender assignment within the affective lexicon at large. We will then introduce historical evidence to support the psycholinguistic validity of this hypothesis.

4.1. *Gender assignment of native German affect nouns*

The Wehrle-Eggers (1961) and the Duden (1981) thesauruses were used to develop an extensive sample of affect nouns (nouns with primary reference to emotional states and/or affective personality traits) in order to test the following hypothesis:

Hypothesis A3:
(i) Affect nouns will have *masc* or *fem*-gender assignment.
(ii) Nouns with Introverted affect will tend to have *fem*-gender.
(iii) Nouns with Extroverted affect will tend to have *masc*-gender.
(iv) Nouns in the middle of this semantic polarity will either be evenly distributed among *masc* and *fem*-gender, or will have gender alternation.

Care was taken to include all nouns with relevant affective meaning, and to exclude both nouns from neighboring semantic fields and also complex nouns with gender assignment based on non-semantic principles.[16] All nouns in this sample are 'native German' in that they are (a) of Germanic origin, (b) newer formations from German stems, or (c) borrowed nouns which

[16] Affective Cognitive States were distinguished, on the one hand, from intellectual states such as *der Verstand* 'intellect' and *der Zweifel* 'doubt', and on the other hand from activities or external states of affairs which are associated with affective states, such as *der Sieg* 'victory' and *die Niederlage* 'defeat'.

Two morphosyntactic principles provide automatic gender assignment for derived and compound nouns without regard to the semantic associations of the noun. These are:

(a) The already mentioned *Last Member Principle*, which assigns gender to nouns with derivational affixes such as *die Achtung* (fem) 'respect' and to compound nouns such as *die Langeweile* (fem) 'boredom'.

(b) *The Zero Derivation Principle*, which assigns neuter gender to nouns derived from other parts of speech without affixation such as *das Vertrauen* 'trust' (< verb) and *das Elend* 'misery' (< adjective).

These principles belong to another level of gender assignment which is free of semantic determinism, a topic to be returned to in section 5.3. Nouns with gender-associated phonetic segmental or syllabic characteristics were retained because of the historical interplay between semantic and phonetic determinism. These include nouns with the final unstressed syllable *-e*, and romance loanwords with the final stressed syllables *-enz*, *-anz*, and *-ie*.

are assimilated enough to be clearly perceived as 'native'. The subjective specification for Introversion–Extroversion given in section 1 (submissive, accepting, accessible/vulnerable and altruistic, vs. aggressive, rejecting, remote and selfish), as well as the operational definition provided by the objective polarities in experiment 2, were used to sort the sample into nouns with Introverted and Extroverted affective connotation. Letter codes are used in appendix B to indicate the specific sense(s) in which each term is Introverted or Extroverted.

It quickly became clear that a number of nouns, such as *die Freude* 'joy', could not be classified by the subjective definition because the feelings they express are not clearly aggressive or submissive, accepting or rejecting, etc. They do, however, all express a state of emotional *arousal*, and so they were grouped together as a third class standing between Introversion and Extroversion. Table 8a gives the quantitative distribution of gender assignment in each of the affect categories for native German nouns and table 8b gives examples for each category. The entire sample is listed in appendix B.

Table 8a
Gender assignment of native German nouns conveying Affective Cognitive States. Sample based on Wehrle-Eggers (1961) and Duden (1981). Complex nouns with gender determined by the Last Member and the Zero Derivation Principles are not included.

	Introversion	Arousal	Extroversion
Masc	6	8	33
Fem	31	11	6
Neut[17]	1	0	0

$\chi^2_2 = 37.8$, $p < 0.001$ for the distribution of *masc* and *fem*-gender in the Introversion and Extroversion categories.

Table 8b
Examples for table 8a. A complete listing is given in appendix B.

	Introversion	Arousal	Extroversion
Masc	der Kummer	der Wahn	der Hohn
	der Gram	der Rausch	der Wille
	der Schmerz	der Schrecken	der Ärger
Fem	die Furcht	die Gier	die Strenge
	die Scheu	die Freude	die Härte
	die Geduld	die Wut	die Hoffart

Table 8a shows a striking distribution in favor of Hypothesis A3: firstly, of 96 native nouns, only one – *das Glück* 'happiness, luck' – has *neut*-gender.[17] With the exception of this one highly frequent core lexical item, *neut*-gender is systematically excluded from the lexical field of Affective Cognitive States. Secondly, table 8a shows a strong skewing in the distribution of *masc* and *fem*-gender. Introverted concepts mostly have *fem*-gender, Extroverted concepts mostly have *masc*-gender, and the intermediate Arousal concepts are about evenly distributed. A chi-square test for the significance of the distribution of gender in the Introversion and Extroversion categories yields a miniscule probability ($p < 0.001$) that this distribution could be due to chance, random gender assignment.

Further evidence for the strength of the classification is provided by the competition with phonetic and morphological gender-assignment principles, as discussed in Zubin and Köpcke (1981), Köpcke (1982), and Köpcke and Zubin (1983). Nine of the Introverted concepts have *fem*-gender in spite of the presence of a *neut*-gender morphological feature (*Ge-* in *die Geduld* 'patience'), a *masc*-gender morphological feature (*-er*, e.g. in *die Trauer* 'sorrow, mourning') and several *masc*-gender determining phonetic features (e.g. final nasal in *die Scham* 'shame' and final [-lt] cluster in *die Schuld* 'guilt'). The exceptions to the classification are particularly interesting. Of five *fem*-gender exceptions to Extroverted Affect, four have the *fem*-gender determining morphological feature *-e*, as in *die Strenge* 'sternness', and four of the seven *masc*-gender exceptions to Introverted Affect have *masc*-gender determining phonetic characteristics, as in *der Kummer* 'worry' (*-er*) and *der Schmerz* 'pain' (initial [š + C] cluster, initial and final consonant clusters). These examples highlight the competition between phonetic/morphological principles on the one hand, and the semantically based Affect classification on the other hand. In some cases the semantic classification wins out, and sometimes the morphological and phonetic principles support a lexical item's resistance to being integrated into the affect field. This competitive dynamic suggests the need for an historical investigation into gender change and semantic shift, a topic to be taken up in the next section.

A final remark about the gender assignment of the Arousal concepts in table 8 is necessary. Concepts which seem to have some association with 'warm', 'beautiful', 'round', and 'constant' on the semantic differential

[17] A small number of *neut*-gender nouns, including *das Elend* 'misery' and *das Vertrauen* 'trust' still correspond to adjectives and verbs, and are thus still identifiable as zero-derivations with derivationally determined *neut*-gender (see fn. 16). The *neut*-gender of *das Glück* derives historically from the now phonologically-weakened prefix *ge-*.

scales used in experiment 2 have *fem*-gender, including *die Lust* 'desire', *die Freude* 'joy' and *die Wonne* 'rapture', while concepts tending to an association with 'cold', 'ugly', 'jagged', and 'changeable', including *der Schreck(en)* 'terror', *der Schauder* 'fright' and *der Schauer* 'thrill, terror', have *masc*-gender. These specific associations with Arousal concepts suggest the possibility that the conceptual field underlying the gender assignment of the affect lexicon may be composed of a multidimensional family of related polarities, rather than the unidimensional polarity suggested by Introversion–Extroversion. In any case, our goal is to show that gender assignment in the Affect lexicon is conceptually organized. A refinement of the semantic polarity or polarities involved awaits further research.

In general, the distribution of nouns in table 8 shows that Hypothesis A can be extended to the affect lexicon at large. Most native German nouns with Introverted affect have *fem*-gender, and most with Extroverted affect have *masc*-gender. Furthermore, a majority of the exceptions show a morphological or phonetic motivation for their exceptional status. In the next section we will inquire into the historical origin of this skewing.

4.2. *Integrative historical change in the affect class*

The near categorical gender assignment at the poles of the Introversion–Extroversion continuum is enough to demonstrate that a semantic categorization is *available* to speakers of the language as an aid to psycholinguistic processing whether or not they make use of it. The experimental evidence for *mut*-compounds in section 2 suggests that speakers are indeed aware of the semantic categorization, and that it corresponds to their gender assignments. A third kind of evidence – historical changes in the class – constitutes an 'experiment of nature' which could confirm that the language community has actually made use of the semantic categorization in making gender assignments over a long period of time. We therefore formulate the following hypotheses:

Hypothesis A4: integrative historical change
(i) *Semantic shift:* nouns will shift in affective meaning in accordance with their gender. *Fem*-gender nouns will become Introverted and *masc*-gender nouns will become Extroverted.
(ii) *Gender change:* nouns will change gender in accordance with their affective meaning. *Masc* and *neut*-gender nouns with Introverted affect will change to *fem*-gender; *fem* and *neut*-gender nouns with Extroverted affect will change to *masc*-gender.

(iii) *Expulsion:* *neut*-gender nouns may leave the semantic field (lose affect meaning) or be lost from the language rather than being integrated through gender change. In addition, *masc* and *fem*-gender nouns with conflicting affective connotation may leave the semantic field or be lost rather than being integrated.

Fortunately, there are a number of excellent resources which allow a systematic test of at least the first two parts of this hypothesis. These include: Benneke (1854), Graf (1834), Grimm and Grimm (1854-1952), Lexer (1872), Michels (1889), Paul (1956-59), Polzin (1903), and Sanders (1876). The primary evidence for Hypothesis A4 bears on semantic shift (i), and gender change or stabilization of gender variation (ii).

Among the nouns in the Introversion class, *die Gunst* 'goodwill', *die Pein* 'pain', *die Qual* 'torment', and *die Reue* 'remorse' had *masc/fem*-gender alternation in MHG but now have *fem*-gender only, a change suggesting stabilization in accordance with their semantic characteristics. Integrative semantic change is evident in *die Scheu* 'shyness' which meant 'disgust, abhorrent apparition' in MHG (coinciding with occasional *masc*-gender alternation), in *die Not* 'distress' which began with the meaning 'coercion', and in *die Tugend* 'virtue, chastity' which meant 'proficiency, strength' in MHG, a connotation which it still holds in archaic contexts. *Die Angst* 'anxiety' and *die Furcht* 'fear' had meanings in MHG which lay outside of the affect class: they referred to concrete circumstances of danger which could give rise to fear and anxiety, but not to these feelings themselves. Another sign of semantic cohesion is provided by *die Andacht* 'devotion' which resists conversion to *masc*-gender in spite of the Last Member Principle (the other compounds with *-dacht* have *masc*-gender). Within the group of Introverted concepts we thus find ample evidence supporting parts (i) and (ii) of Hypothesis A4.

The historical development of nouns in the Extroversion group reinforces the picture of semantic cohesion. A number of nouns had *fem* or *neut*-gender during an earlier period, often in accordance with an earlier semantic association or with their derivational or loanword origin. Of particular interest is the noun *der Mut*, which constitutes the Last Member of the compound nouns investigated in section 2. According to the OHG entries in Graf (1834) this noun had *masc* or *neut*-gender (and all three genders in compounds!), in accordance with the broad connotative range of 'disposition, mood' which it continues to have in compounds today. Outside of compounds, however, *der Mut* has narrowed to the Extroverted affective

range of 'courage, boldness', with a concomitant limitation to *masc*-gender in modern German.

Der Hohn 'scorn' had *fem*-gender in OHG when it included 'disgrace' in its connotative range. *Der Hass* 'hate' originated in early germanic with *neut*-gender, as attested by Gothic and other sister languages. *Der Frevel* 'wantonness, misdeed' originated in OHG and *der/das Ungestüm* 'impetuosity,[18] vehemence' in MHG as *fem*-gender *-i* derivations from their corresponding adjectives (parallel to *gut–die Güte*), while *der Zorn* 'anger' had *neut*-gender in OHG. All three went through a period of gender variation in MHG before stabilizing with *masc*-gender, in accordance with the strong Extroversion of these concepts. *Der Grimm* 'anger' appeared in MHG alongside the older *fem*-gender noun *die Grimme* with the same meaning, which then disappeared by the beginning of the NHG period. In OHG, *der Ernst* 'seriousness, sternness' apparently occurred with all three genders, but since MHG it has only *masc*-gender. *Der Pik* 'grudge, rancor' began with *fem*-gender as a French loanword *la pique* (fem), but now has this gender only as a secondary alternant. The Last Member Principle should determine *fem*-gender for *der Abscheu* 'abhorrence' (its Last Member is a *fem*-gender noun), but the semantic cohesion of the Extroversion class has apparently attracted this noun, so that *fem*-gender is listed in Duden only as a secondary variant. *Der Schneid* 'pluck, bravery' has its origin in soldier's language of the 19th century as a metaphorical application of *die Schneide* 'blade edge'. At first it maintained *masc/fem*-gender alternation in accordance with its metaphorical tie to the *fem*-gender noun, but now has only *masc*-gender. Finally, *der Hader* 'strife, dissension' has recently extended its meaning into the affect field from its former more limited reference to the exterior circumstances giving rise to such feelings, and thus has now semantically shifted in exactly the opposite direction of *die Fehde* 'feud'. Here again we thus find ample evidence to support parts (i) and (ii) of Hypothesis A4. In total there have been integrative historical changes for about one-fourth of the nouns in the *fem*-gender Introversion group of nouns, and for about one-third of the nouns in the *masc*-gender Extroversion group.

Evidence for expulsion from the Cognitive Affective States class is less conclusive because of the nature of such data: to develop an exhaustive or even representative sample of expulsed nouns would require an examination of the entire nominal lexicon, including all extinct nouns. However, on the

[18] *Ungestüm* has a *neut*-gender variant related to the prefix *ge-*.

basis of Bahder (1925), Götze (1912) and Osman (1971), as well as the previously mentioned sources, some examples of the expulsion of *masc*, *fem*, and *neut*-gender nouns can be given to demonstrate at least the plausibility of part (iii) of Hypothesis A4.

A number of nouns whose gender assignment was incompatible with an affective meaning have now lost their reference to an Affective Cognitive State. *Der Gehorsam*, which until recently covered a semantic range from Introverted affective state ('submissiveness') to action ('carrying out orders') is now almost entirely limited to the action meaning. *Die Fehde*, as a *fem*-gender derivation from a Germanic adjective, originally connoted an Extroverted affective state ('animosity, hostility'), which was extended by the MHG period to include resulting actions ('conflict, fight'), and now is limited to the specific action sense of 'feud'.[19] *Das Lieb*, as a *neut*-gender zero-derivation from the adjective *lieb* in OHG, had a semantic range from 'object of love' to 'feeling of love' (as preserved in the set expression *in Lieb und Leid* 'in love and sorrow'), but now exists only as a poetic word for 'loved one'.

Neut-gender nouns with affective meaning which failed to change gender have been entirely lost to the language. These include zero-derivations from verbs that had related meanings until early NHG: **das trozen* 'obstinacy', **das erwegen* 'trust, dependence', and **das bochen* 'arrogance, defiance'. The only *neut*-gender noun left in the class (other than zero-derivations still supported by their adjectival or verbal base – see fn. 16) is *das Glück* 'luck, happiness'.

Among extinct *masc* and *fem*-gender nouns which had affective meaning conflicting with their gender assignment, *Durst* provides a particularly instructive case. In MHG there was a gender distinction, and a phonetic distinction in the initial consonant, between *Durst* 'thirst (masc)' and *turst* 'boldness (fem)'. In early NHG this balanced distinction in form and meaning was upset by a phonetic change which collapsed the initial consonants to /d/, and a simultaneous attempted integrative gender change for *Durst* 'boldness': Luther occasionally used *masc*-gender for this noun, and Grimm and Grimm report *masc*-gender as a free alternant. Had this integrative gender change

[19] These two nouns, as action nouns, still obviously carry affective connotation in conflict with their gender assignment. The point is that they have moved away from the *core* of the affect class in losing their reference to an Affective Cognitive State. The mental sense of *der Gehorsam* is now largely replaced by *die Unterwürfigkeit* 'submissiveness', while the mental sense of *die Fehde* is replaced by *die Feindschaft* 'hostility'. Both have gender determined by the Last Member Principle (suffixes *-keit* and *-schaft*).

been completed (as it was for a number of nouns), it would have produced complete homonymy for *der Durst* 'thirst' and **der Durst* 'boldness'. Thus, **Durst* 'boldness' was caught between the semantic incompatibility of *fem*-gender on the one hand and the homonymy produced by *masc*-gender on the other, and became extinct. While the threat of homonymy does not inevitably result in the loss of one of the lexical items, it frequently does (Öhmann 1934).

Until MHG, the derivation of *fem*-gender nouns from adjectives with the suffix *-e* (*-i* in OHG) was fully productive. Since that time this suffix has lost its productivity, and is now indistinguishable from the final syllable *-e* which also correlates with *fem*-gender, but is subject to semantic class competition. The result has been a rapid loss of these derived *fem*-gender nouns, or rather in most cases, a shift to the suffix *-heit/-keit*, whose *fem*-gender determination is immune from semantic competition (see fn. 16). Nouns with Extroverted affective meaning have been particularly subject to this process. They include:

until 16th/19th century		*present*
*die Heitere	'cheerfulness'	die Heiterkeit
*die Raue	'rudeness, coarseness'	die Rauheit
*die Kühne	'boldness, daring'	die Kühnheit
*die Snelle	'bravery, quickness'	*
*die Schläue	'cunning'	die Schlauheit

(*Schläue* is now in the process of being replaced by *Schlauheit*.)

The only Extroverted nouns which have not been lost in this group are *die Härte* 'harshness' and *die Strenge* 'sternness', compared with six Introverted nouns which have remained. Another three Extroverted nouns in the group (discussed above) have shifted to *masc*-gender.

The following nouns, in a similar fashion, were trapped between a morphological or phonetic principle determining one gender, and an affective meaning determining the other gender. **Besorg* 'anxiety, care' had *masc*-gender in MHG in accordance with the prefix *be-*. In early NHG it developed a *fem*-gender alternant in accordance with its Introverted affect, and then became extinct. **Tucht* 'ability, proficiency' and **Guft* 'high spirits, loud yelling' both suffered from the competition between the Fricative Cluster Principle (non-sibilant fricative + *t* = *fem*-gender) (Köpcke and Zubin 1983) and the *masc*-gender association of Extroverted affect. *Tucht* had *fem*-gender

in MHG while *Guft* had *masc*-gender; they both developed alternation with the other gender before becoming extinct. Other nouns were trapped between the Phonetic Cluster Principle (CC__CC = *masc*-gender) (Köpcke and Zubin 1983) and the *fem*-gender association of Introverted affect. These are **der Glimpf* 'gentleness, appropriateness' and **der Brast* 'grief, worry'.

The three instances of semantic shift out of the Affective Cognitive States Class, and the 14 instances of extinction detailed above, lend credence, although not conclusive validation, to part (iii) of Hypothesis A4 predicting that if nouns do not integrate they will move out of the class or become extinct. The 14 instances of extinction are particularly suggestive in this regard because they all contain morphological or phonetic factors which seem to have blocked an integration. This data suggests *form–meaning conflict* as a systemic factor affecting the viability of lexical items alongside the numerous cultural, formal, and semantic factors that have traditionally been implicated (Osman 1971).

Up to this point three types of historical evidence have been brought to bear on the predictions made in Hypothesis A4: integrative changes in gender, integrative shifts in affect connotation, and expulsions from the affect class that have an integrative effect by removing dissonant elements. Without the summary effect of these historical changes there would be, in the present language, little or no basis for claiming the presence of an affect association with gender at all. There would be only 40 Introverted and Extroverted nouns left in table 8a that had maintained an appropriate gender assignment since OHG, and there would be 41 nouns with conflicting gender assignment, instead of the current 12 such dissonant nouns listed in table 8a. Thus the contemporary affect association of *masc* and *fem*-gender seems to have evolved during and since the OHG period.[20] Figure 2 provides a graphic overview of these integrative historical changes.

There are 12 nouns (see table 8) in the current sample which have

[20] In this context an historical question of significance to cognitive theory arises which cannot be pursued further here: what is the historical core around which the gender association of Affective Cognitive States first began to emerge in OHG? Was it a small number of highly frequent affect nouns? Or was it the then-productive class of *mut*-compounds, which had different membership from the present class (listed in table 2), but had the same property of variable gender assignment (Graf 1834)?

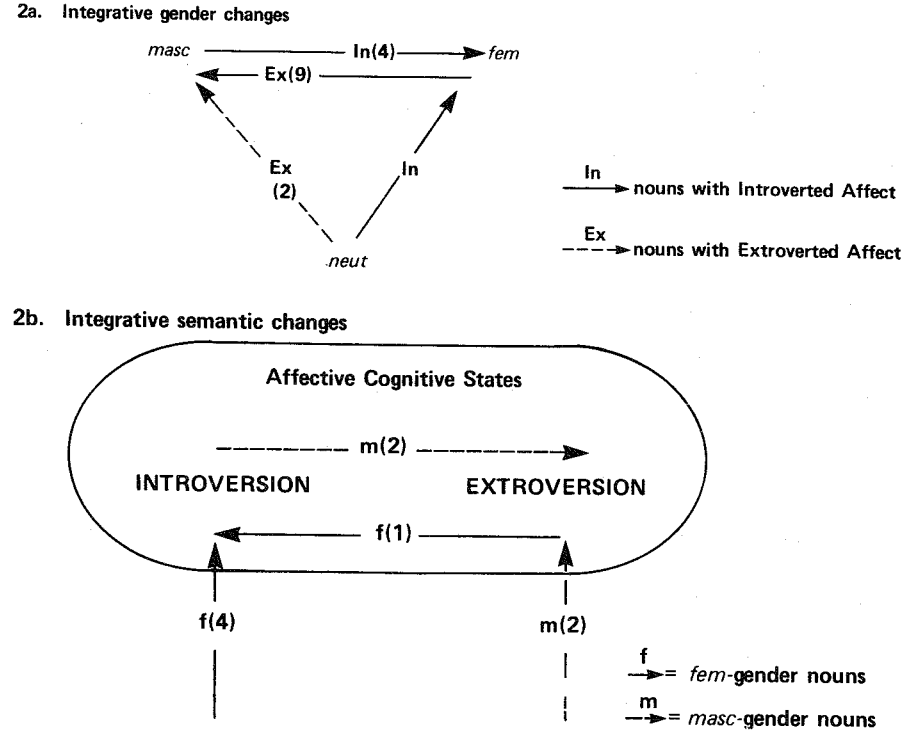

Fig. 2. Historical changes increasing the gender integration of the Affective Cognitive States class. Numbers in parentheses give the number of examples in the text illustrating each type of change.

maintained an affective meaning in conflict with their gender. Four of these have extremely low frequency in the standard language: *der Bammel* 'anxiety', *der Harm*, a poetic word for 'grief', *die Hoffart* 'arrogance', and *die Traute*, a Berlin dialect expression for 'courage'. The low frequency of these words and the user specialization of two of them places them in the grammatical periphery, which tends to preserve morphological irregularity (Vachek 1966). Zubin and Köpcke (1981, 1984c) and Köpcke (1982) argue that words in the grammatical periphery are either one step from extinction, or are preserved in the language by their use among a special interest group. Since they are rarely if at all produced by members of the language community at large, they are not subjected to integrative pressures in the cognitive organization of the individual.

Furthermore, several of the non-integrated nouns have a clear explanation in the conservatism of language change. *Die Härte* 'harshness' and *die Strenge* 'severity' are the last Extroverted remnants of a formerly productive *fem*-gender derivational process. *Der Bammel* earlier also referred to a person or thing that arouses anxiety, and *der Kummer* 'grief' referred to 'rubble'; both of these meanings belong to *masc*-gender semantic classes. *Die Hoffart* 'arrogance' contains a phonetic assimilation from MHG *hoch* + *fahrt*, which had *fem*-gender based on the Last Member Principle. The now conflicting gender of this noun, along with the conflicting gender of *die Tugend* in the archaic sense of 'manly virtue' may be not only the passive consequence of the inertia of linguistic change, but may rather be an active signal of the 'old-fashioned' flavor of these nouns in fairy-tale narrative contexts.

In this section we have tested three historical hypotheses based on the affect categorization of Introversion and Extroversion, and found ample evidence for all three, as depicted in figure 2. Figure 2a shows that 15 nouns have made integrative gender changes, with the only unattested gender change being *neut* > *fem*. Figure 2b shows that nine nouns have made integrative semantic changes, with some nouns shifting between Introversion and Extroversion within the field, and other nouns entering the semantic field by taking on affective meaning appropriate to their gender. Finally, figure 2c shows that there are at least 17 instances in which nouns with gender–meaning dissonance have been expulsed from the semantic field, or from the language. There are, no doubt, numerous other such instances. These three kinds of change present an historically dynamic picture in which

nouns seek an equilibrium between their gender and a particular semantic field. This picture, we believe, is incompatible with Hypothesis B, namely, the idea that the gender of a noun is determined arbitrarily or on the basis of association to some other noun. If this were so, gender change would either not occur at all, or would move arbitrarily in all directions. Similarly, semantic change and expulsion would be expected to occur arbitrarily. Thus the systematicity of change supports the hypothesis that the gender of these nouns is gradually being integrated into a semantic field. In the next section we will present further historical evidence for Hypothesis A based on lexical innovation.

4.3. Historical additions to the affect class

During and since the MHG period a large number of nouns have come into the class of Affective Cognitive States through three kinds of process: semantic change, derivational and analogical processes within the language which created new nouns out of other parts of speech, and lexical borrowing from other languages. The relatively small number of instances of semantic change in which nouns take on affective meaning have been discussed above in section 4.2. For the second type of addition we formulate the following hypothesis:

Hypothesis A5: as affect nouns are created through analogical and derivational processes, they will take on *masc* or *fem*-gender in accordance with the Extroversion or Introversion of the concept they express.

New Extroverted nouns provide a particularly cogent test of this hypothesis since well into the early NHG period it was possible, and quite popular, to derive *fem*-gender nouns from adjectives by umlauting the vowel and adding the suffix *-e* (Paul 1959), as is the case for the Introverted affect nouns *die Milde* 'gentleness' (< *mild*) and *die Güte* 'kindness' (< *gut*). In addition, the zero-derivation of *neut*-gender nouns from verbs and adjectives was and continues to be freely productive, as is the case for the Introverted affect nouns *das Vertrauen* 'trust' (< verb *vertrauen*) and *das Elend* 'misery' (< adjective *elend*). Since well-worn pathways existed for deriving *fem* and *neut*-gender nouns it is remarkable that, with three exceptions (see table 8b) only *masc*-gender Extroverted affect nouns were produced and/or continue to survive. These include:

der Ärger	'annoyance'	der Groll	'resentment'
der Dünkel	'arrogance'	der Rank	'artifice'
der Eifer	'zeal'	der Stolz	'pride'
der Ekel	'loathing, disgust'	der Verdruss	'irritation'
der Geifer	'spittle, wrath'	der Überdruss	'disgust, satiety' (between 'boredom' and 'disgust')
der Grimm	'anger'		

Some of these are stem- or backformations from verbs; the rest have non-generalizable analogical origin. Among *fem*-gender nouns with Introverted affect, *die Schmach* 'disgrace' is a MHG *fem*-gender *-e* derivation which has lost its suffix, and *die Trauer* 'grief' is a MHG backformation from a verb.

There is, thus, ample evidence to support Hypothesis A5: newer nouns created from the internal resources of the language have taken on *masc* or *fem*-gender largely in accordance with their affect meaning. This conclusion of course *excludes* nouns with still-productive derivational suffixes, as they belong to another semantic-free level of gender assignment to be discussed in section 5.

If the Affect class, and within it the Introversion–Extroversion polarity, truly has synchronic psycholinguistic validity as a cognitive principle organizing the assignment of gender to nouns, then it should exert its influence not only on the native German lexicon, but also on loanword vocabulary. To evaluate this possibility we extracted from Mater (1967) all the affective state nouns with the *masc*-gender associated final syllable *-mus*, and the *fem*-gender final stressed syllables *-ie*, *-anz*, and *-enz*, which have their origins in Latin and French vocabulary and are presently felt to be germanified loanwords. These nouns are assigned their gender, first of all, on the basis of a *phonetic* association between their final syllables and a specific gender. They are clearly distinguished, moreover, from the productive *morphological* association between gender and German derivational suffixes such as *-keit*, to be discussed in section 5, because the loanwords were borrowed as wholes, while the German lexical derivations were produced in the German language community, and continue to be spontaneously created by speakers every day. If in the face of a phonetically-determined gender assignment the Introversion–Extroversion semantic polarity is to play a role, then it must have an effect first of all on which French and Latin words are spontaneously borrowed in the speech of bilinguals, and secondarily on which of them are retained as stable lexical items by the monolingual language community, vs. which of them are denied a linguistic foothold. This consideration leads us to Hypothesis A6:

Hypothesis A6 : *fem*-gender loanwords expressing Introverted affect should be more easily integrated into the German lexicon than those expressing Extroverted affect. Similarly, *masc*-gender loanwords expressing Extroverted affect should be more easily integrated than those expressing Introverted affect.

The wordlists given in Mater (1967), derived from a variety of contemporary German dictionaries, provide a rough indication of which loanwords have at least some stability in the German lexicon. An important consideration

Table 9a
Affective polarity of loanwords ending with the stressed syllables *-ie*, and *-anz/-enz*, associated with *fem*-gender, and with the syllable *-mus* associated with *masc*-gender.

	Introversion	Arousal/neutral[a]	Extroversion
Fem-gender			
-ie	15	6	5
-anz/-enz	11	1	5
Total	26	7	10
Masc-gender			
-mus	5[b]	2	13

$\chi^2 = 9.7$, $p < 0.01$ for the distribution of *masc* and *fem*-gender in the Introversion and Extroversion categories.

[a] Most of the nouns in the middle column convey Arousal, which we have argued in section 4.1 is an affective dimension distinct from Introversion/Extroversion. Four nouns convey neutral affect midway between Introversion and Extroversion, the position occupied by *Gleichmut* in section 2.2.

[b] *Der Sentimentalismus*, one of the Introverted exceptions to *masc*-gender *-mus* derivations, is listed in Mater (1967) and is therefore part of our sample. It is not listed in Duden (1963), which replaces it with *die Sentimentalität*.

Table 9b
Examples for table 9a. A complete listing is given in appendix C.

	Introversion	Arousal/neutral[a]	Extroversion
Fem-gender	die Melancholie	die Ekstasie	die Ironie
	die Toleranz	die Euphorie	die Arroganz
Masc-gender	der Sentimentalismus[b]	der Stoizismus	der Egoismus
	der Altruismus	der Indifferentismus	der Optimismus

[a] See note a to table 9a.

[b] See note b to table 9a.

is that his selection was made independent of any semantic hypothesis, and therefore cannot bias the results. Table 9a gives the semantic field distribution of these loanwords, and table 9b illustrative examples.

A statistical analysis shows the trends favoring the hypothesis to be significant: *fem*-gender loanwords tend toward Introverted affect, and *masc*-gender loanwords toward Extroverted affect. This loanword study provides still further support for the general hypothesis that gender assignment in the affective lexicon is based on a general semantic categorization or set of categorizations, and is not arbitrary.

In section 4 we have presented evidence supporting six distinct hypotheses concerning the diachronic integration of nouns into the Introversion–Extroversion semantic field. This evidence is of itself intuitively attractive, but its exact relation to the synchronic distribution presented in table 8, and to the experimental evidence presented in section 2, needs further elucidation. The synchronic distributional evidence shows that there is a correlation in the lexicon between gender and semantic field, whether or not it forms part of a speaker's linguistic competence (it might be an accidental 'conspiracy' of numerous unrelated factors irrelevant to competence). The experimental evidence demonstrates that speakers behave as though they make use of a gender–semantic field correlation in their performance of specific tasks, which does suggest that they may do so in the normal process of comprehension and production, but on the other hand could also reflect task-specific strategies. The historical evidence provides a third link in the psycholinguistic argument. Historical change is a process in which groups of individual speakers gradually revise specific aspects of their internal grammars, especially in intergenerational transmission. It thus constitutes an 'experiment of nature' in which changes in productive and receptive competence result from the operation of forces which are at least in part unobservable. The diachronic 'experiment' thus provides a natural proving ground for hypotheses formulated on the basis of synchronic data. To state the link precisely: *speakers must have been learning and storing gender information, and making new gender assignments, in accordance with Hypothesis A in order to have produced the pattern of historical changes which actually occurred.* To conclude otherwise is to assume an inexplicable conspiracy of multiple factors.

5. Cluster formation vs. rule-governed gender assignment

The gender changes and semantic shifts of nouns within the class of Affective Cognitive States, the expulsions from this class, and the additions described in the previous sections give credence to the view that the distribution of gender in the affective lexicon is not an accident of myriad unrelated historical changes, but rather reflects the psychological force of the field of Cognitive Affective States (= *masc/fem*), and within it the polarity between Introversion (= *fem*) and Extroversion (= *masc*) as a semantic bias guiding gender assignment in a psycholinguistic sense. Yet, this semantic principle does not possess the force of a psychologically autonomous rule, as do the Last Member Principle and the Zero-Derivation Principle, which apply virtually without exception to all nouns within their domains and provide automatic gender assignment for spontaneous nominalizations. The Introversion–Extroversion polarity applies only to a limited domain of nouns whose bounds can to some extent be stated by generalization (e.g. complex nouns with gender determined by morphological principles are excluded), but for the rest must be stated by individual exception, as is evident from the distribution of gender in table 8a.

This 'weak rule' pattern of gender assignment reflects, we believe, an underlying cognitive organizational principle of *Cluster Formation*. We view this principle as a lexical manifestation of cognitive schema formation (Neisser 1976), with characteristics closely related to the concept of Prototype (Posner 1973; Rosch 1977; MacWhinney 1981). In a hierarchy of cognitive organization types Cluster Formation is located midway between isolated rote-learning of gender assignments on the one hand, and rule-derived gender assignments on the other. Speakers confidently know the gender of some high frequency core nouns in the Cluster as individual rote-learned associations. These nouns define the cluster. Speakers also know the gender of other, less frequent nouns in the Cluster, but this vulnerable rote knowledge is reinforced by association with other nouns in the Cluster having similar semantic characteristics and like gender. Still other nouns in the Cluster have unstable gender representation, or the gender may even be unknown to the speaker; but on the basis of Cluster membership and semantic similarity the speaker is still able to assign gender to them. The nouns in a cluster thus form a cognitive associative network (Quillian 1966; Loftus and Loftus 1976) in which gender may be 'inherited' (Levesque and Mylopoulos 1979) from one noun to another within the network of the Cluster. This network eases the gender access and retrieval process in

comprehension and production for some nouns, and makes a stable gender assignment possible for others.

5.1.

Several types of evidence presented here support this view of Cluster Formation. In experiment 1, speakers knew first of all to exclude *neut*-gender as a possibility for *mut*-compounds in spite of apparent uncertainty about some of the nouns. Secondly, they differed one from another in their decisions about many individual nouns, but their collective decisions revealed a clear tendency to make a *masc*-gender assignment for Extroverted concepts, a *fem*-gender assignment for Introverted concepts, and an even mix of gender for concepts in the middle of this polarity. Since these speakers were uncertain about the gender of at least some of the *mut*-compounds, they must have been guided by a generalized knowledge of the overall semantic organization of the cluster.

The integrative historical changes discussed above in section 3.2 also support the concept of Cluster Formation. Apparently, with the passage of time speakers gradually become increasingly uncertain about isolated rote gender assignments and opt for the overall semantic associations of the cluster, producing gender change. Or, the gender of a noun may be stable, but speakers add to the connotative range of the noun's meaning in the direction of semantic compatibility with the cluster, leading to semantic integration.

Two of the *fem*-gender exceptions to the Extroversion class in table 8 provide an insight into the operation of clusters by exposing the effects of competition. These two nouns – *die Härte* 'harshness' and *die Strenge* 'severity' – are members of a large *fem*-gender Cluster defined phonetically by the final syllable *-e* and morphologically by their derivational relationship to adjectives (*hart* and *streng*, respectively). Although this relationship no longer represents a productive derivational process, it holds for 60 percent of the 57 most frequent monosyllabic adjectives in Morgan (1933). Thus, as long as a *fem*-gender noun maintains this relationship to a current adjective it belongs to the morphologically defined cluster and is able to resist integration into a semantic class. On the other hand, if the adjective becomes infrequent or is dropped from the lexicon, as happened with *der Frevel*, which in MHG was *die vrevele* corresponding to the adjective *vrevel*, then the noun loses membership in the morphologically defined cluster and is attracted by the semantic cluster. The same transition occurred for *der*/

das Ungestüm. When this noun lost the *-e* suffix that gave it membership in the *fem*-gender cluster, it was attracted both by the Extroversion pole of the semantic cluster giving it *masc*-gender and by a *neut*-gender morphological cluster formed around the prefix *ge-*. Thus, this noun now has *masc/neut*-gender alternation replacing its earlier *fem*-gender.

The discussion of noun extinction also provided several instances of cluster competition in which nouns developed *masc/fem*-gender alternation in response to a conflict between the affect cluster and either a morphological or a phonetic cluster. **Besorg* had Introverted affect, but also the *masc*-gender prefix *be-*. **Tucht* and **Guft* had Extroverted affect, but also the *fem*-gender final cluster [x/f + t].

Finally, experiments reported in Köpcke and Zubin (1983) show that, as phonetic features from different *masc*-gender Clusters are combined with each other in nonce words, native speakers are more and more likely to assign *masc*-gender to the nonce word. Clusters may thus intersect to form Prototype clusters in which the nouns sharing all the gender features are Prototypes.

5.2.

Clusters share with rote knowledge the fact that at least some nouns have a specific and stable gender association in the cognitive network. They share with rule-derived gender assignments the presence of a generalization which unites a group of nouns with like gender. The crucial difference between rule-derived and cluster-based gender assignment is that *rules do not admit unmarked exceptions*. Any exception must be 'tagged' as such in the lexicon. For example, speakers know not to apply the Last Member Principle to *der Abscheu* 'abhorrence' as an isolated fact about this noun (sometimes they do apply it, producing *die Abscheu*). On the other hand, speakers 'know', as an individual fact supported by semantic association, that a noun belongs to a particular cluster. Other nouns which have rule-assigned gender, or which have a deviant rote-learned gender, simply do not belong to the associative network of the cluster; they are 'non-members' rather than exceptions. The cognitive utility of clusters derives from their being a more highly organized schematic form of memory structure than simple associations and rote knowledge (Clark and Clark 1977), yielding greater stability of gender assignment.

The cluster of nouns conveying Cognitive Affective States has a particularly interesting internal structure. Membership in the cluster is established by

the denotation of an Affective Cognitive State and a *masc* or *fem*-gender assignment. As stated above, there is only one *neut*-gender noun (*das Glück*) which is semantically eligible for membership in the cluster, making the cluster boundary appear near-categorical. Next, within the cluster there is a polarity, or *Tension Field* between the two poles of Introversion and Extroversion. The closer the semantic association between a noun in the cluster and one of these poles, the more likely it is to have the gender of that pole.

5.3.

If the Introversion–Extroversion polarity does play such a strong role in gender assignment to the affective lexicon, and if other semantic groupings, such as the drinkable liquid class mentioned in the introduction, play an equally strong role, then one might well ask why, in the passage of centuries, semantic principles for gender assignment should not become ubiquitous and ever more systematically consistent, resulting in a small set of unified and transparent semantic distinctions. The answer may lie, we believe, in the Saussurian (1916) view of semantics as substance. The substance of thought, in this view, does not consist of a finite (or recursively definable) set of cognitive categories, so that neither can the substance of semantics in the lexicon. Lexical meaning is necessarily vague, fuzzy, having boundaries that are indeterminate and somewhat different for different speakers. In addition, the meaning of lexical items has in many cases been shown to follow the Wittgensteinian model of overlapping connotations known as 'family resemblance' in the psychological literature (Rosch and Mervis 1975). Finally, research in cognitive psychology on construction theory has shown that vague lexical meanings can be constructed through rich inferential processes into concrete and precise sentential meanings (Beaugrande and Dressler 1981; Greenspan 1982). Speakers' communicative semantic processing is focussed on producing and deriving textual meaning, not on abstracting an exact picture of lexical meaning from all the contexts in which a lexical item might be used.

Given this picture of diffuse lexical meaning, it is no wonder that speakers might experience uncertainty in intuitively placing the meaning of a particular lexical item along an Introversion–Extroversion continuum. Such uncertainty was evident in differences among individual ratings made by speakers in experiment 2. In some cases, the ratings of a few speakers were distributed across the entire scale between two polar adjectives. This means that speakers

might easily arrive at different decisions about gender assignment for the same concepts. The results of experiment 1 speak directly to this point. Table 2 shows that speakers clearly did not categorize all *mut*-compounds as either *fem*-gender or *masc*-gender. Rather, for 13 of the 17 nouns at least one speaker disagreed with the majority about gender assignment. For four of the 17 nouns – those semantically midway between Introversion and Extroversion – there was *substantial disagreement* about gender assignment, and apparently about semantic classification.

The uncertainty of semantic classification is abetted by the historical process of lexical replacement documented in section 4.3, which adds system-contrary nouns to the lexical field. To some extent, the semantic classification is able to exert its influence on gender assignment to newly created nouns, but this process is above all under the control of morphological derivation. *Die Härte* 'hardness' and *die Strenge* 'sternness', discussed in section 4.2, are the remnants of an extinct *fem*-gender determining morphological derivation. The semantic classification also exerts influence on the survival of newly borrowed nouns, but a number of system-contrary borrowings continue to survive, with gender determined by the source language. For example, *die Bravour* 'boldness', *die Courage* 'courage', and *die Arroganz* 'arrogance' are all *fem*-gender nouns in French. Thus, the cumulative effect of integrative historical changes produced by the semantic classification is continually offset by system-contrary lexical additions.

Faced with the uncertainties of semantic classification and the system-contrary effects of lexical innovation, which could surely lead to an accumulation of nouns with variable or system-contrary gender and eventually to the abandonment of the gender system altogether, speakers would find a procedure which permits immediate non-semantic decisions for newly-formed nouns to be of immense utility and economy in the communicative process. Such a procedure is provided by the Last Member Principle. As stated in the introduction, a conservative, dictionary-based estimate shows that nearly 70 percent of the German nominal lexicon consists either of zero derivations, or of compound nouns and nouns built from verbs, adjectives, and other nouns with productive derivational suffixes. In each of these cases, the gender of the composite noun is determined by a gender rule based on the final morphological segment with no regard to the semantic content of the composite. The *fem*-gender suffixes *-heit/-keit*, *-ung*, and *-ität* play a particularly strong role in this regard. In spontaneous speech speakers can and do produce new nouns from almost any verb or adjective. Extroverted nominal concepts may be produced with these suffixes as easily as Introverted concepts:

	Introversion	*Extroversion*
-heit/-keit	Traurigkeit 'sadness'	die Hartherzigkeit 'hardheartedness'
	Sanftheit 'gentleness'	die Bissigkeit 'sarcastic attitude'
-ung	die Ergebung 'submissiveness'	die Verachtung 'contempt'
	die Bewunderung 'admiration'	die Ereiferung 'overzealousness'
ität	die Servilität 'servility'	die Agressivität 'aggressiveness'
	die Sentimentalität 'sentimentality'	die Animosität 'animosity'

The point is made most graphic perhaps by showing that *fem*-gender nouns can be formed from *all* of the adjectives which were used to represent the Extroversion pole in experiment 2:

hoch	die Höhe	hässlich	die Hässlichkeit
rauh	die Rauheit	froh	die Fröhlichkeit
klar	die Klarheit	laut	die Lautheit
kalt	die Kälte	eckig	die Eckigkeit
gross	die Grösse	gespannt	die Gespanntheit
wild	die Wildheit	trocken	die Trockenheit
aktiv	die Aktivität	veränderlich	die Veränderlichkeit
stark	die Stärke		

In this paper we have reported three types of evidence – synchronic (distributional), historical, and experimental – which all converge on the presence of an active cognitive principle for the memory organization of gender assignment in a limited semantic domain: nouns referring to Affective Cognitive states, including subgroups with the Last Member *-mut*, and with the suffixes *-nis* and *-sal*. The domain as a whole is limited to *masc* and *fem*-gender. Within the domain, a polarity between Introversion and Extroversion is associated with *fem* or *masc*-gender, respectively, at the two extremes, and with gender variation for some nouns in the middle. We ascribed to this memory organization not the status of a rule principle, for which we take free productivity and the near-absence of exceptions to be criterial, but rather the status of a cluster principle, corresponding closely

to the concept of Prototype in the psychological literature. This type of cluster structure, we predict, will turn out to be typical rather than exceptional in the German nominal lexicon. Further distributional studies of semantic fields, as in Zubin and Köpcke (1984a, b) provide one avenue for testing this prediction. A number of psycholinguistic methods can also provide illuminating evidence. These include (a) semantic differential testing for the entire field of Affect nouns in appendix B, which above all can provide deeper insight into the structure of the semantic polarity or polarities involved. (b) Rapid gender assignment under time pressure: this method can show that speakers tend to integrate less frequent nouns with exceptional gender into the semantic field. We have already observed that some speakers produce *die Harm* 'grief' and *die Gram* 'sorrow' rather than the etymologically normative *der Harm* and *der Gram* listed in dictionaries. (c) Nonce-word testing, in which context supplies each nonce word with a specific affective connotation.

In answer to the psychological question raised in the introduction, we are moving toward the answer that German speakers are imposing ever greater degrees of organization on gender assignment in the form of clusters, and rules such as the Last Member and Zero Derivation Principles. Arbitrary gender assignment, we hypothesize, is tolerated only in the grammatical core and periphery (Köpcke 1982 and Zubin & Köpcke 1984b, c have already provided evidence for this position).

In answer to the functional question we find ourselves less optimistic.[21] Noun classification does, to be sure, have a clear communicative function to the extent that it is marked on the pronoun, as in German, or on the verb, as in Swahili. It increases the efficiency of anaphoric (and exophoric) reference, lessening the need for recourse to nouns. This efficiency is gained, however, at the expense of a tremendous investment in learning, and in production strategies to cope with gender assignment. Surely, for a creature that seems continually to be reducing the effort of communication this investment would not be worth it, unless of course, the *categorization had a psychological value in and of itself.* We suggest that human language is not only a response to the demands of communication, but also, as suggested by Saussure, a response to the needs of a creature which is forever categorizing and recategorizing its environment in the pursuit of understanding and control.

[21] Zubin and Köpcke (1984c) provide a more extensive discussion of possible communicative and psycholinguistic process functions of noun classification.

Appendix A1 : Complex nouns with the derivational suffix *-nis*

Sample based on Mater (1967). Words marked with * had variable *fem/neut*-gender into the 19th century (Paul V, 1959).

Fem-gender nouns

Introv. affective state	*Introverted affect-related*	*Non-affect*
Bangnis	Düsternis	Befugnis
Bängnis	Empfängnis	Begehrnis
Behagnis	Fäulnis	Beharrnis
Bedrängnis*	Finsternis*	Bewandtnis
Besorgnis*	Feuchtnis?	Erkenntnis*
Betrübnis*		Erlaubnis
Bitternis*		Ersparnis
Empfindnis		Gebührnis
Fährnis (Angst)		Kenntnis
Kümmernis*		Unkenntnis
Trübnis*		Wildnis
Verdammnis		
Verderbnis*		
Wirrnis		

Neut-gender nouns

Extroverted activity	*External circumstance for emotion*	*Non-affect*
Bekenntnis*	Ärgernis*	Begebnis
Gelöbnis*	Bedürfnis*	Behältnis
Geständnis	Begängnis*	Bildnis*
Vermächtnis	Begräbnis*	Bündnis*
Wagnis*	Erlebnis	Ereignis*
Zerwürfnis*	Fördernis	Erfordernis*
Zeugnis*	Gefängnis*	Ergebnis
	Hemmnis	Erzeugnis
	Hindernis*	Gedächtnis*
	Verhängnis*	Geheimnis
	Verlöbnis	Geschehnis
		Gleichnis
		Verhältnis*
		Verzeichnis*
		Vorkommnis
		Verständnis*

Variable-gender nouns (fem/neut)
Beschwernis*
Säumnis
Versäumnis

Appendix A2: Complex nouns with the derivational suffix *-sal*

Sample based on Mater (1967)

die Drangsal	das/die Wirrsal	das Labsal
die Mühsal		das Rinnsal
die Trübsal		das Scheusal
		das Schicksal

Appendix B: Native nouns referring to Affective Cognitive States, tabulated in table 8a

Sample based on Duden (1972) and Wehrle/Eggers (1961). German definitions are derived from the relevant parts of dictionary entries in Duden (1976), and where these did not clearly relate the affective meaning of the term, from Klappenbach and Steinitz (1961-1977) (marked KS). Upper/lower case letters keyed to chart below give the specific sense in which each word conveys affect. Parentheses are used when the specific sense is only sometimes, or only weakly present. Compare with chart on p. 51.

1. Introversion – native vocabulary

die Acht	b(c)	in Acht nehmen: mit etw. sorgfältig umgehen
die Andacht	bc	innere Sammlung, Anteilnehme
die Angst	ac	Gefühl der Beklemmung
die Bange	ac	Angst, Furcht
die Beschwerde	(a)c	Schmerzen, körperliches Leiden
die Busse	abcd	Reue und Wille zur Besserung
die Ehre	c	Wertgefühl, Würde
die Eintracht	bc	1. Übereinstimmung, Vertrag 2. Milde, Nachsicht im Bezug auf eine verdiente Strafe
die Furcht	ac	Gefühl des Bedrohtseins
die Geduld	(a)bc(d)	Ausdauer im ... nachsichtigen Ertragen
die Gnade	bc(d)	1. wohlwollende Gesinnung, Gewogenheit 2. Milde, Nachtsicht im Bezug auf eine verdiente Strafe
die Gunst	bc(d)	wohlwollende, freundlich entgegenkommende Haltung
die Güte	bc(d)	freundlich-nachsichtige Einstellung
die Huld	bc(d)	Freundlichkeit, Wohlwollen, Gunstbeweis
die Marter	ac	seelische oder körperliche Qual
die Milde	bc(d)	durch Toleranz, Mitgefühl, Verständnis ausgezeichnete Gesinnung, Güte
die Pein	ac	heftiges körperliches/seelisches Unbehagen
die Qual	ac	(KS) in höchstem Masse unangenehmes Gefühl
die Reue	abc	tiefes Bedauern über etwas
die Ruhe	bc	1. Stille 2. Untätigkeit, Entspannung
die Scham	ac	durch das Bewusstsein versagt zu haben ... mit ... dem Wunsch, sich vor anderen zu verbergen, verbundene (quälende) Empfindung

die Schande	ac	(KS) Zustand des Verachtetseins ... in den man durch schuldhaftes Tun geraten ist
die Scheu	ac	Gefühl der Ängstlichkeit ... das einen veranlasst, sich von jemandem, etwas fernzuhalten
die Schmach	ac	(KS) Demütigung, Kränkung, die jemand durch einen ... Vorwurf ... erleidet
die Schuld	a(b)c	(KS) das Verantwortlichsein für ungesetzliches Handeln, für die Verletzung sittlicher Gebote
die Sorge	bcd	bedrückendes Gefühl der Unruhe und Angst
die Sorgfalt	bc	grosse Behutsamkeit
die Trauer	(a)bc	seelischer Schmerz über einen Verlust
die Treue	abcd	das Treusein; zuverlässig in seiner Gesinnung einem anderen, einer Sache gegenüber
die Tugend	bc	1. Sittlich wertvolle Eigenschaft eines Menschen 2. (veraltet) Keuschheit, Jungfräulichkeit
die Würde	bc	Achtung gebietender Wert, der einem Menschen innewohnt
der Bammel	ac	(salopp) Angst, Furcht
der Gram	ac	nagender Kummer, dauernde tiefe Betrübnis
der Harm	(a)c	(veraltend) zehrender, grosser, innerlicher Schmerz, Kummer, Gram
der Jammer	ac	1. mit Weinen vermischtes Klagen 2. Elend, zu beklagender Zustand, leidvolles Dasein
der Kummer	ac	1. Gram, Schmerz über ein schweres Geschick 2. trauriger, niedergedrückter Gemütszustand
der Schmerz	ac	1. sehr unangenehme Empfindung 2. tiefe seelische Bedrückung, Kummer, Leid
das Weh [see fn. 17]	ac	seelischer Schmerz, Leid
das Elend [see fn. 17]	ac	Unglück, Leid, Kummer (ugs. trostloser Zustand)
das Leid [see fn. 17]	ac	tiefer seelischer Schmerz als Folge erfahrenen Unglücks
das Glück	c	Gemütszustand innerer Befriedigung

2. Arousal

der Gieper		(Norddeutsch) plötzlich wach werdende Begierde
der Graus		Grausen, grauenerregendes Ereignis
der Hunger		1. starkes Verlangen, etwas zu essen 2. heftiges leidenschaftliches Verlangen, Begierde
der Rausch		1. Verwirrung der Gedanken und Gefühle, durch Genuss von zuviel Alkohol, Drogen o.ä. 2. übersteigerter Gefühlszustand, in dem die Kontrolle des normalen Bewusstseins ausgeschaltet ist
der Schauder		1. heftige Empfindung von Kälte 2. heftige (plötzliche) Empfindung von Grauen, Angst, Entsetzen, oder Ehrfurcht

der Schauer		1. Niederschlag von grosser Intensität, aber kurzer Dauer 2. Schauder
der Schreck(en)		Heftige Gemütserschütterung
der Wahn		1. Einbildung, irrige Annahme 2. krankhafte, zwanghafte Einbildung, Manie
die Begier(de)		auf Genuss und Befriedigung gerichtetes leidenschaftliches Verlangen
die Freude		hochgestimmter Gemütszustand, Gefühl des Aufschwungs
die Geile		(veraltet) geil: vom Sexualtrieb beherrscht
die Gier		massloses Verlangen, ungezügelte Begierde
die Glut		1. glühende Masse 2. leidenschaftliches Gefühl, Leidenschaftlichkeit
die Inbrunst		starkes, leidenschaftliches, hingebendes Gefühl
die Liebe		starkes Gefühl des Hingezogenseins zu einem anderen
die Lust		1. inneres Bedürfnis, etwas Bestimmtes zu tun 2. heftiges, auf die Befriedigung sinnlicher Bedürfnisse gerichtetes Verlangen
die Sucht		1. krankhafter Zustand der Abhängigkeit von einem bestimmten Genuss- oder Rauschmittel 2. übersteigertes Verlangen nach etwas, Manie
die Wonne		(veraltend) hoher Grad der Beglückung, der Freude
die Wut		heftiger, unbeherrschter, durch Ärger o.ä. hervorgerufener Gefühlsausbruch

3. Extroversion

der/die Abscheu	AB	heftiger Widerwille, starke Abneigung
das (der) Arg	BCD	(veraltet) Boshaftigkeit
der Ärger	AB	von aggressiver innerer Auflehnung geprägtes Erleben persönlicher Beeinträchtigung; Unmut, Unwille
der Argwohn	BC	seelische Einstellung, hinter dem Tun eines anderen eine gegen die eigenen Interessen gerichtete Absicht zu vermuten
der Dünkel	ABCD	übertriebene Selbsteinschätzung, Hochmut
der Eifer	A	intensives, fleissiges Streben, Bemühen
der Ekel	AB	Übelkeit erregendes Gefühl des Widerwillens, Gefühl des Überdrusses
der Ernst	A(b)	(KS) Gesinnung, die mit Überlegung und Entschiedenheit an die Dinge herangeht
der Frevel	AB(D)	(veraltend) Verstoss gegen die Ordnung, und zwar aus bewusster Missachtung
der Geifer	AB	1. aus dem Mund fliessender Speichel 2. gehässige, wütende Worte ('Hass und Geifer')
der Geiz	BCD	übertriebene Sparsamkeit
der Genuss	D(b)	geniessen: 1. von einer Speise, einem Getränk zu sich nehmen 2. mit Freude, Wohlbehagen in sich aufnehmen

der Gift	AB	(...) einen Gift auf jemanden haben (...) Ärger
der Grant	(A)BC	(Süddeutsch, ugs) Übellaunigkeit, Unwille, Unmut
der Greuel	B	Empfindung der äussersten Abneigung, Abscheu
der Grimm	BC	(veraltend) tiefsitzender, heftiger Zorn
der Groll	B	heimliche, eingewurzelte Feindschaft oder verborgener Hass
der Hader	ABC	Zank, Streit, heftige Meinungsverschiedenheit
der Hass	AB	starkes Gefühl der Ablehnung und Feindschaft
der Hohn	AB(D)	mit verletzendem Spott verbundene Äusserung der Verachtung
der Mumm	A	(ugs) Entschlossenheit und Tatkraft, sich zu einem Wagnis aufzuraffen
der Mut	A	Furchtlosigkeit angesichts einer Situation, in der man Angst haben könnte
der Neid	(A)D	Empfindung, jemandes Besitz oder Erfolg selbst haben zu möchten
der Nipf	A	(Österreich ugs) Mut, Energie
der (die) Pik	B	'Pik auf jemanden haben': gegen jemanden einen heimlichen Groll hegen
der Schneid	A	Mut, mit Draufgängertum verbunden
der Stolz	A(B)	Selbstwertgefühl; Selbstbewusstsein und Freude über einen Besitz, eine Leistung
der Trieb	A(D)	1. innerer Antrieb, der auf die Befriedigung starker, oft lebensnotwendiger Bedürfnisse zielt 2. (veraltend) Lust, Verlangen, etwas zu tun
der Überdruss	B(C)	Widerwille, Abneigung gegen etwas, mit dem man sich sehr lange beschäftigt hat
der/das Ungestüm	A	Temperament ohne Zurückhaltung Ausdruck geben
der Verdruss	BC	Missmut, Ärger
der Wille	A	Fähigkeit, sich bewusst für oder gegen etwas zu entscheiden
der Zorn	AB	heftiger, leidenschaftlicher Unwille
die Härte	ABC	1. das Hartsein; 2. Strenge, Unerbittlichkeit
die Hoffart	AB	(veraltend) Dünkel, anmassender Stolz
die Strenge	AB(C)	das Strengsein, Härte, Unerbittlichkeit
die Traute	A	(ugs) innere Bereitschaft zum Entschluss
die Tücke	BCD	hinterhältige, heimtückische Boshaftigkeit
die Zwietracht	BC	böse Gesinnung gegen einen anderen

Appendix C: Loanwords

Sample based on Mater (1967). Tabulated in table 9a.

a. Introversion	*b1. Arousal*	*c. Extroversion*
die Apathie	die Aphrodisie	die Antipathie
die Athymie	die Ekstasie/Ektase	die Ironie
die Galanterie	die Euphorie	die Bizarrerie

(a. Introversion)	*(b1. Arousal)*	*(c. Extroversion)*
die Hypothymie	die Hysterie	die Koketterie
die Lethargie	die Manie	die Pedanterie
die Lypemanie		
die Melancholie	*b2. Neutral*	die Arroganz
die Nostalgie	der Stoizismus	die Insolenz
die Phobie	der Indifferentismus	die Renitenz
die Prüderie	die Akribie	die Penetranz
die Sympathie	die Indolenz	die Konsequenz
die Venerie		
die Bonhomie		der Egoismus
die Harmonie		der Enthusiasmus
die Grazie		der Pessimismus
		der Sarkasmus
die Dezenz		der Zynismus
die Konzillianz		der Snobismus
die Obedienz		der Wandalismus
die Toleranz		der Heroismus
die Konnivenz		der Rigorismus
die Munifizenz		der Narzissmus
die Kulanz		der Dogmatismus
die Perseveranz		der Fanatismus
die Benevolenz		der Pedantismus
die Reverenz		
die Pönitenz		
der Sentimentalismus		
der Altruismus		
der Defätismus		
der Quietismus		
der Optimismus		

Nouns with suffixes other than those tabulated in table 9a

die Askese	die Erotik	die Bravade
die Romantik	die Hektik	die Bravour
die Mystik	die Panik	die Courage
	die Passion	die Hybris
	die Rage	die Ranküne
	der Furor	der Degout
	der Horror	der Ennui
		das Odium

Postscript

After this article went to press we received a letter from Oliver John of the University of Bielefeld confirming that the affect polarity proposed by us to account for the distribution of *masc*- and *fem*-gender has general validity in the psychology of personality. The specific polarities that we list on p. 51 and the semantic differential scales used by us (table 4) correspond closely to the two "classical dimensions of interpersonal [personality] traits" as summarized in Wiggins (1979), which are drawn from the "big five" personality factors of Norman (1963). The first of these is *Surgency*, which is also labeled "Power, Dominance, Assertiveness, etc.", and the second one is *Agreeableness*, which is also labeled "Warmth, Love, Affiliation, etc.". It is clear from the specific descriptors listed in Table 2 of John, Goldberg and Angleitner (1984) that the assignment of gender to Affect nouns in German corresponds exactly to a blend of these two personality factors.

John's letter argues convincingly that 'Extroversion–Introversion' is a poor, and even misleading label for the combination of these two personality factors, and we agree. His letter also suggests that these two factors correlate well with male–female sex stereotypes and cites figure 2.1 of Ashmore (1981 : 45) as evidence. We are nonetheless reluctant to conclude that German speakers assign gender to affect nouns according to their stereotypes of male and female behavior, since it could be the other way around: there could be a deep-rooted polarity in our understanding of personality and affect which influences the assignment of gender on the one hand, and influences our stereotypic attitudes about maleness and femaleness on the other.

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