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Paradigmatic Relationships in German Action Noun Formation

Abstract: This study explores four German nominalization patterns (*-ung*; *-erei*; *Ge-X-e*; nominalized infinitives) using corpus and web data. We conclude that they can be considered a word formation paradigm, as some functions depend on paradigmatic oppositions. Our case study supports gradual differences between inflectional and word formation paradigmaticity.

Keywords: derivational morphology; word formation paradigms; action nouns; German word formation; evaluative morphology; word formation across registers; derivation vs. inflection

1. Introduction

In this paper, we investigate a potential case of a word formation paradigm in German. The four major (i.e. most productive, Motsch 2004: 331–335) patterns forming action nouns seem to stand in a systematic paradigmatic opposition regarding their formal (grammatical) and functional (semantic) features. This opposition is sketched out in Table 1 and the paragraph following it.¹

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- 1 The four patterns will be referred to using the following labels: *-ung* for *-ung* suffixation; NI for nominalized infinitives; *Ge-X-e* for the circumfixation pattern, even though the final *-e* is usually absent when the base is an *-eln* or *-ern* verb (*bimmeln* ‘jingle’ → *Gebimmel(e)* ‘jingle’, cf. Fleischer & Barz 2012: 266); *-erei* for *-erei* suffixation, even though with *-eln* and *-ern* verbs, only *-ei* is attached, e.g. *meutern* ‘to mutiny’ → *Meuterei* ‘mutiny’ (cf. Fleischer & Barz 2012: 199). The nominalized infinitive (NI) is included as syntactic conversion for several reasons: It is functionally on a par with the three affixal-derivational patterns. It is the most productive process forming action nouns. These nouns enrich the lexicon and, in spite of their hybrid status between morphology and syntax, inflect as nouns (Ehrich 1991: 442f., Vogel 1996: 22–26 for discussion) just like the products of the derivational patterns. The restriction of NI to lack plural forms is shared by derivational *Ge-X-e*. Within the lexicon, products of syntactic conversion may enter paradigmatic relationships with products of derivation and may establish a network of word formation schemas. Though judgements vary, we see syntactic conversion as a (special) case suitable for being integrated in word formation. In this decision we follow, e.g., Fleischer & Barz (2012: 88f., including discussion). These considerations justify using terms such as *word formation paradigm* or *paradigmatic relations in word formation* for the potential network of the four patterns under investigation. The alternative *nominalization paradigm* suggested by an anonymous reviewer emphasizes the syntactic process of creating nouns. This purely

Tab. 1: Four patterns deriving German action nouns.

-ung e.g. <i>die Forschung</i> ‘research, f.’	Nominalized Infinitive (NI) e.g. <i>das Forschen</i> ‘researching, n.’
-erei e.g. <i>die Forscherei</i> ‘research, pluractional, f.’	Ge-X-e e.g. <i>das Geforsche</i> ‘researching, pluractional, n.’

While NI and *-ung* are neutral as to speaker evaluation, *Ge-X-e* and *-erei* have a pluractional meaning, that is “repetition within the boundary of one event that, despite its internal complexity, is viewed as a single coherent unit, with no change of participants” (Tovena 2015: 109 following Cusic 1981). *Ge-X-e* and *-erei* are suspected to bring on evaluative effects (e.g., Harden 2003, Dammel and Quindt 2016). While formations in *-ung* and *-erei* are said to imply a perfective/summary perspective on the action, have feminine gender, and are count nouns, formations with NI and *Ge-X-e* perspectivize the action as processual/imperfective, have neuter gender, and lack plural forms (cf. Werner 2012: 158, Ehrich 1991: 442f.). Moreover, *Ge-X-e* and *-erei* show a division of derivative labor also with respect to their bases (e.g. regarding the morphological complexity and actional semantics of base verbs, cf. Harden 2003: 127–133 and Section 3.1).

Using this quartet of candidates as a case study, we discuss in this paper what chances arise from taking a paradigmatic perspective on word formation, i.e. a perspective that takes associative/substitutive relations (cf. Saussure 1916: 173) between word formation patterns and systematic functional distinctions based on these relations seriously (see van Marle 1985, Štekauer 2014 for discussion). While Saussure had all kinds of paradigmatic relations between lexemes in mind, we narrow down the term *word formation paradigm* to word formation patterns which a) share the same bases and b) stand in a close and systematic functional relation.

Our definition of word formation paradigm is inspired by the canonical definition of inflectional paradigms used in canonical typology. The canonical approach means taking definitions “to their logical end point” (Corbett

processual perspective does not reflect the schematic generalizations between the four patterns we investigate. Moreover, on a theoretical and methodological level, our case study is meant as an example for focusing on paradigmatic relations in word formation with a view to encourage studies on other cases from a relational perspective. This perspective would be lost by narrowing down the terminology. Not included in Table 1 are two marginal patterns forming action nouns with achievement semantics in terms of Vendler (1957: 147). One pattern is characterized by internal modification (ablaut) *springen* ‘to jump’ → *Sprung* ‘(one) jump’, the other is a subschema of *er*-derivation, e.g. *hüpfen* ‘bounce’ → *Hüpfen* ‘(one) bounce’. The former is fossilized, the latter weakly productive (Motsch 2004: 333, 336).

2007: 9) and, in a second step, taking this canonical ideal as a reference point for comparing paradigms occurring in real life (i.e. languages). In a canonical inflectional paradigm, a stem is invariant across the paradigm cells of a lexeme, whereas affixes differ across cells, contributing systematic, predictable functional distinctions (inflectional categories and their features). Analogously, in the canonical word formation paradigm, the base is invariant across the cells of the paradigm. These cells are constituted by word formation patterns by way of contributing systematic, predictable functional distinctions to the word formation products. These distinctions arise not only on the syntagmatic axis through the semantics of the respective formative, but decidedly also on the paradigmatic axis through the opposition of the word formation schemas involved. As this is a canonical definition delivering an extreme but intersubjective measure, real word formation patterns can be more or less tightly organized in paradigms and thus more or less close to this theoretical construct.

If paradigmatic relations between word formation patterns show systematic, predictable form-meaning correspondences to a high degree, we will call them a word formation paradigm. As is well known e.g. from analogical change, word formation patterns in general show weaker paradigmatic relations than word forms in an inflectional paradigm; however, within word formation, we can observe different degrees of interrelatedness and systematicity. Some patterns are more systematically related than others, and the case we choose is a good candidate for strong paradigmatic relations. With its focus on paradigmatic relations and their degrees, our approach is word-based (van Marle 1985: 26f.) and suitable for modelling in a network account such as Construction Morphology (Booij 2010).

Of course, word formation paradigms evince some characteristics different from inflection. However, this is a matter of degree, too. Using the inflectional paradigm as an extreme anchor of comparison is justified by the broad support for a gradual view on differences between inflection and derivation (e.g., Bybee 1985: Ch. 4, Dressler 1989, Booij 2006, Štekauer 2015). Bybee's (1985) cross-linguistic study on verb morphology for instance shows that one and the same function, e.g. aspectual distinctions, can be realized derivationally as well as inflectionally (Bybee 1985: 30–31). In a canonical word formation paradigm, shared bases are modified by word formation schemas that contribute meaning differences in a systematic way through their opposition. Derivational categories prone to constitute paradigmatic morphology have a high degree of generality in meaning in Bybee's (1985: 16–19) sense, i.e. few input restrictions. Like some inflectional categories, such as number in nouns, they are always inherent categories, modifying the base concept, not the syntactic context (arguments). Though word formation schemas differ from inflectional paradigms in their ability to change the lexical category of the base (*forschen* V → *Forschung* N), the crucial point in common is the systematic formal and

functional opposition in a closed group of word formation schemas constituting a word formation paradigm. Thus, a word formation paradigm is based on a time-stable division of labor between the equally productive schemas involved, which occupy complementary semantic cells. In this respect, a word formation paradigm can be viewed as a conceptual counterpart of Lindsay & Aronoff's (2013: 4) notion of competition between derivational patterns competing for one and the same function.

We are going to test for our case how close and systematic the paradigmatic relationships between the four word formation patterns are and how paradigmaticity shapes what speakers can do with these patterns. The question of paradigmaticity in word formation is essentially a two-sided question, one part of it being an empirical concern: Is the paradigmatic view of a given word formation system or subsystem empirically adequate? The other part of the question is theoretical or methodological in nature: Is the paradigmatic view of word formation fruitful for word formation analysis and/or word formation theory? Both questions will be revisited in the concluding section.

Based on a corpus study, we are going to argue that the four schemas forming German action nouns show a systematic opposition and thus constitute a word formation paradigm. Consolidating results from previous research, the four nominalization patterns seem to exhibit the systematic form-meaning relations shown in Table 2. This overview summarizes in a nutshell the assumptions in the literature on German action nouns that are important for our line of argumentation (for more detailed accounts see, e.g., Kurth 1953a,b, Ehrich 1991: 442f., Olsen 1991, Demske 1999, 2000, Harden 2003, Hartmann 2013, 2016; Werner 2012: 147–149, 160, 167–169, 216–217, Dammel and Quindt 2016). The categorial meanings involved are aspectual (columns) and +/-evaluative (rows).

Tab. 2: Assumed paradigmatic distinctions in German action nouns.

	Imperfective e.g. action, process • neuter gender • mass (no plural possible)	Perfective e.g. event, result • feminine gender • count (plural possible)
Descriptive, neutral	Nominalized infinitive (NI) e.g. <i>Forsch-en</i> 'researching' (imperfective, neutral) • fully productive	<i>-ung</i> e.g. <i>Forsch-ung</i> 'research' (perfective, neutral) • decreasing in productivity
Expressive speaker evaluation	<i>Ge-X-e</i> e.g. <i>Ge-forsch-e</i> 'researching', (imperfective, evaluative) • pluractionality • prosodic base constraints • diachronic layering: collective nouns (<i>Gebirge</i> 'mountain range')	<i>-erei</i> e.g. <i>Forsch-erei</i> 'research' (perfective, evaluative) • pluractionality • diachronic layering/polysemy: locative nouns, professions (<i>Brauerei</i> 'brewery')

Table 2 suggests systematic form–meaning relations among the four nominalization schemas, which seem to qualify as a word formation paradigm. However, the systematic relations still need to be verified empirically. Before proceeding to the goal and design of our empirical study, we will present the theoretical concepts and terms that we use to refer to paradigmatic phenomena in word formation. Essential concepts are adopted from Construction Morphology (see below). Table 3 gives an overview of the essential notions and their interrelations.

Tab. 3: Schematic overview on essential notions with respect to paradigmatic word formation.

	first order level	second order level
abstract level	<i>word formation schema</i> ² an abstract representation of a systematic correspondence between a morphological form and a meaning, e.g. $\langle [V_j\text{-ung}]_{\text{NI}} \leftrightarrow [\text{NOM}[\text{SEM}_j]]_i \rangle$ ³	<i>word formation paradigm</i> consists of two or more word formation schemas that show systematic, predictable form–meaning relations to one another, e.g. the system of <i>-ung</i> , <i>-erei</i> , <i>NI</i> , and <i>Ge-X-e</i> as drafted in Table 2
concrete level	<i>(morphological) construct</i> a concrete instantiation of a word formation schema, e.g. <i>Forschung</i> ‘research’	<i>word formation set</i> set of two or more morphological constructs that show systematic, predictable form–meaning relations to one another, e.g. <i>Forschung–Forscherei–Forschen–Geforsche</i>

The distinction between concrete and abstract levels in Table 3 builds on the respective notions in Construction Grammar (e.g. Goldberg 2013: 17) and Construction Morphology (see, e.g., Booij 2010: 4). All items defined in Table 3 can be conceived of as parts of the constructional network, i.e. the *constructicon*. Each item has *links* (or connections, relations, associations) to other items. Specifically, concrete constructs are connected to abstract schemas via *instantiation links*, which work both ways, bottom-up and top-down:

2 For these basic Construction-morphological notions see Booij (2010: 1–31).

3 In this representation of the constructional schema (demarcated by angled brackets), the left-hand part represents the formal side in a simplified manner while the right-hand part refers to the meaning (see Booij 2016: 425 for details on this type of formalization). The meaning representation of the *-ung*-schema is only of exemplary nature and will be specified below.

Concrete words eventually induce or reinforce an abstract schema; abstract schemas may give rise to new concrete words (cf. Riehemann 1998: 67, 2001: Ch. 7.6; for instantiation links and other types of links see, e.g., Ziem and Lasch 2012: 99–102, Hilpert 2014: 60–65). Paradigmatic relationships, e.g. between the schemas *-ung* and *-erei*, can be viewed as connections between items on the same level of abstraction. These connections can be formalized as in (1), where the symbol “≈” indicates paradigmatic relationships (Booij 2016: 435). Together, the schemas connected by paradigmatic relationships form a second order schema, a “schema of schemas” (Booij 2016: 435), i.e. a morphological paradigm. The notation in (1) represents the hypothetical ideal word formation paradigm as drafted in Table 2.

- (1) $\langle [V_i\text{-en}]_{N_j} \leftrightarrow [\text{NEUT IMPERF NOM } [SEM_i]]_j \rangle \approx$
 $\langle [Ge\text{-}V_i\text{-e}]_{N_k} \leftrightarrow [\text{EVAL IMPERF NOM } [SEM_i]]_k \rangle \approx$
 $\langle [V_i\text{-ung}]_{N_l} \leftrightarrow [\text{NEUT PERF NOM } [SEM_i]]_l \rangle \approx$
 $\langle [V_i\text{-erei}]_{N_m} \leftrightarrow [\text{EVAL PERF NOM } [SEM_i]]_m \rangle$

As for the vertical connection between a word formation paradigm and its concrete instantiations, i.e. word formation sets, it could be pictured as a *bundle* of instantiation links. The more word formation sets there are, the more they will support the abstract superstructure, i.e. the word formation paradigm. Conversely, the more strongly entrenched a word formation paradigm is, the more it will enhance the formation of words in respective sets: while word formation schemas in and of themselves bear a potential for new coinages,⁴ a word formation paradigm may, arguably, enhance this potentiality since it opens up a cell to be filled by an actualized word.

In our empirical inquiry, we will look into potential evidence for the paradigmatic status of the four schemas. This inquiry needs to reflect the following principal questions: How much weight should be given to requirements inspired by inflectional paradigms such as (a) no or few formal and functional gaps and idiosyncrasies (cf. blocking or secondary semantic change of word formation products) and (b) a similar degree of productivity across the different paradigm cells (which, however, can also be skewed in inflectional paradigms)? These considerations can now be rephrased in terms of concrete word formation sets: How often do we encounter sets that are formally complete (all four patterns are attested with the base verb) and functionally adhere to the meanings shown in Table 2? How many sets, by contrast, are formally incomplete

4 Leaving aside the possible existence of purely analytic/static word formation schemas that are abstract, yet no longer productive.

(e.g. due to incompatibilities of the base with one or more patterns) or are functionally deviant, e.g. by containing lexicalized members?

If the empirical study were to yield a large number of complete word formation sets, this would clearly support the conclusion that the four schemas constitute a word formation paradigm (cf. Pounder 2000: 660: “We assume that the organization of the lexical paradigm [i.e. word formation set] mirrors that of the system structures [i.e. “the ‘master’ systemic paradigm”]”). If, by contrast, the study were to yield a large number of formally and/or functionally ‘defective’ sets, then the applicability of the notion of paradigm to the four schemas would need some profound reflection. Specifically, systematic gaps and incompatibilities should be reflected and the notion of word formation paradigmaticity should be refined.

Determining whether a given word formation set is complete or exhibits gaps crucially hinges on the handling of potential formations. Proponents of paradigmatic word formation emphasize the relevance of **potentiality**, i.e. the availability of paradigm cells in speakers’ competence, in contrast to **actuation**, i.e., the realized filling of paradigm cells in language use (cf., e.g., Pounder 2000: 90, 663 and Štekauer 2014: 361). To account for this distinction between **actualized** vs. **potential** formations in our empirical study, we included two major layers of data: We surveyed an established corpus (Cosmas II newspaper corpora) to capture paradigms composed of actualized words. Additionally, we searched for internet occasionalisms. Thus, by including non-edited data in sources such as web forums and comment sections, we were able to consider formations that are not generally established in German but have been formed spontaneously and are thus good candidates for potential formations (cf. Pounder 2000: 139: “The only reliable method of observation of productivity concerns the non-lexical sphere. This means that one must observe spontaneous word formation in the spoken or written text”).⁵

5 Thus, the notion of *actuation* as proposed for word formation is not to be confused with *actuation* in models of language change (e.g., Weinreich, Labov & Herzog 1968: 102). In language change, *actuation* refers to the starting point of an innovation (and its explanation) in contrast to *transmission* and *diffusion* denoting the spread of innovations in the speaker community and the lexicon. Occasionalisms from the web are at the interface of both notions of *actuation*. They are empirically observable but not spread in the speaker community. Thus, they are a good indicator for the productive potential a word formation schema has on the level of the speaker community.

2. Method

Our empirical investigation essentially included three steps: 1. We compiled random samples of 30 valid types for each of the four schemas, i.e. 120 types taken together (based on the Cosmas II Tagged-M newspaper corpus).⁶ 2. For each type in the four samples, we attempted to assemble its word formation set by checking increasingly large corpora/resources for instantiations of the other three schemas. This allowed us to gain insight into the sizes of the word formation sets and on systematic gaps in the sets. 3. All derivatives that were part of a four-member set were analyzed by two native speakers with respect to their actionality (e.g. process, event, object) and with respect to their evaluative flavor.

Tab. 4: Sources used for the empirical investigation⁷.

original corpus	Corpus S	Cosmas II Tagged-M (newspapers)	28.92 million words
additional corpora/resources	Corpus L	Cosmas II Archive-W, total (predominantly newspapers)	30,816.54 million words
	Web	Internet	

Table 4 gives an overview of the resources we used. Whenever a formation could not be found, the next larger corpus or resource was searched. When

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- 6 For each schema, we used a search string specifying the part of speech as ‘noun’ and specifying the form of the target words by regular expressions. We then exported the results as lists of types and selected our random samples from these lists of types, so that the frequency of a word would not interfere with its chance of making it into the sample. Formations not based on a verb (e.g. *Wäscherei* ‘laundry shop’ from *Wäsche* ‘laundry’ or *Wäscher* ‘washer’) were excluded, since the object of the study was nominalization of verbal concepts. Deverbal *erei*-formations do not cause umlaut of the base (*Wäscherei*, *Bäckerei* ‘action of washing/baking such that it annoys the speaker’), while in denominal formations, bases often have umlaut (*Wäscherei*, *Bäckerei* ‘laundry shop, bakery’) due to umlauting agentive *er*-formations as bases (*Bäcker* ‘baker’), cf. Fleischer & Barz (2012: 198–199). Compounds, e.g. *Markt+entwicklung* ‘development of markets’, were included as instances of the head noun (*Entwicklung* ‘development’). The data from the internet were extracted by conducting Google search queries. We then checked the hits and their contexts manually until we could be sure if the construct in question was attested or not.
- 7 All searches, unless specified otherwise, were conducted in August 2016.

recording the internet attestations, we differentiated between frequent attestations and cases that were occasionalisms (i.e. they occurred only once or twice and clearly were formed on the occasion). This way of successively filling the word formation sets enabled us to assess which slots of a given set are actualized, can potentially be actualized, or cannot (be shown to) be actualized. Table 5 gives a simplified example of what the resulting data sets look like: The first column shows the original string, in this case one of the 30 types randomly sampled for *-ung* nominalization. The corresponding formation on *-erei*, in this case, was found neither in the original corpus nor in the extended corpus but was attested several times on the internet. A corresponding *Ge-X-e* formation could not be found at all, while a nominalized infinitive was present in the original corpus. In sum, the example word is part of a two- or three-member set, depending on whether or not web data are included.

Tab. 5: Example data set: Nominalizations of *identifizieren* ‘to identify’.

original string	<i>-erei</i>	<i>Ge-X-e</i>	<i>-ung</i>	NI	size of word formation set (without web)	size of word formation set (with web)
<i>Identifizierung</i> ‘identification’	<i>Identifiziererei</i> ‘repeated identifying _{EVAL} ’ (internet)	–	<i>Identifizierung</i> ‘identification’ (original corpus)	<i>Identifizieren</i> ‘identifying, tagging’ (original corpus)	2	3

3. Findings and discussion

This chapter provides our results and offers a discussion of how to account for and interpret the findings. Section 3.1 presents the sizes of word formation sets as well as the input constraints that account for systematic gaps. Section 3.2 analyzes the output semantics. Both sections refer back to the paradigmatic cross-tabulation introduced in Section 1. Section 3.3 wraps up the results.

3.1. Paradigm sizes and input constraints

Figure 1 and Figure 2 present the results pertaining to the set sizes. Each column represents the original 30 types of each schema and is subdivided according to how many of these types are part of one-, two-, three-, and four-member word formation sets (abbreviated as *wf sets*). Figure 1 shows the results counting only corpus data while Figure 2 presents the results including web data (multiply attested words as well as occasionalisms).

Fig. 1: Set sizes for sample types of all four schemas, corpus data only.

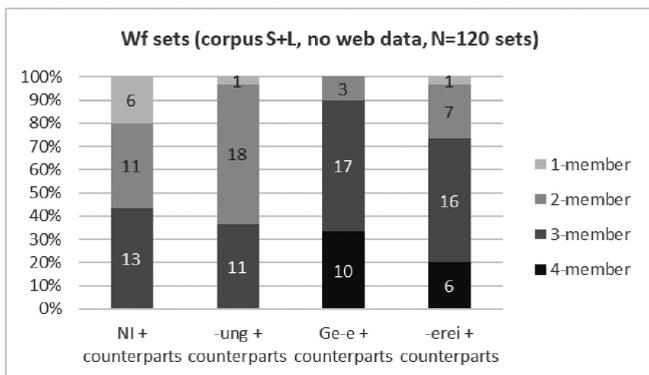
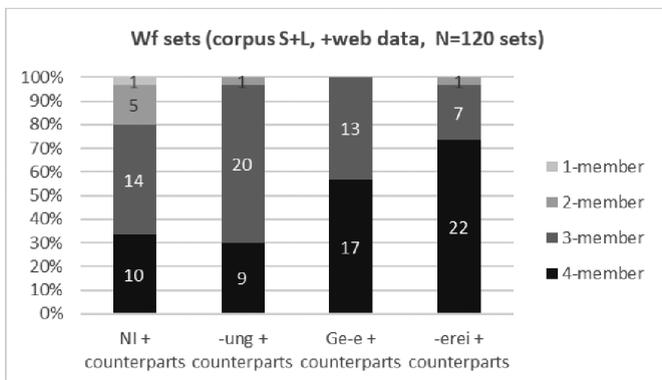


Fig. 2: Set sizes for sample types of all four schemas, corpus and web data.



When only corpus data is counted, just two of the four samples include types that are part of four-member sets. As expected, there are more four-member sets when web attestations are included: Nearly half of the types are part of a four-member set. A total of about 93% of all types are part of a set of at least three members, and there is only one type that has no paradigmatic relations at all.⁸

Figure 3 is based on the same data but grouped differently: The bars show all 120 bases tested for each schema (regardless of what original sample a given base was retrieved from). The bars are subdivided according to what resources were needed to find the respective formations. For instance, with NI, 93 formations were found in the original corpus while none were unattested. *Ge-X-e*, by contrast, is the schema showing the most gaps and the least hits in the original corpus.

8 For the verb *gelingen* ‘to be a success/to work out’, only an NI was found.

Fig. 3: Attestations per schema arranged by source.

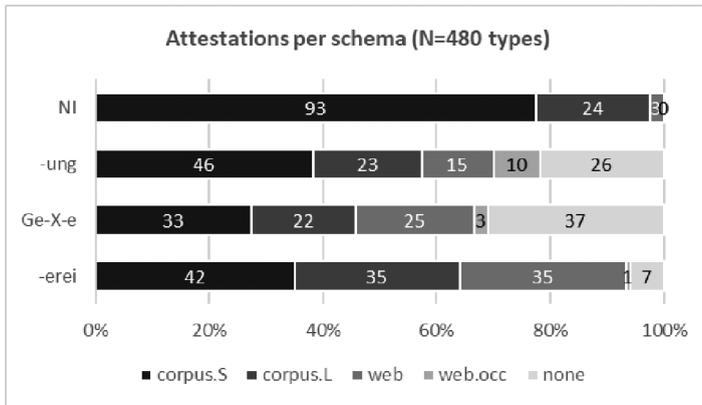


Figure 3 provides insight into register differences as well as different degrees of constraints among the four schemas. As for the register differences, *Ge-X-e* and *-erei* formations show the highest scores of web attestations. They are often found in non-edited writing such as comment sections or web forums, where they typically co-occur with other expressive words, cf. (2).

(2) *Mir geht das ganze geregel, gemauschel, getrickse und das bestimme „von oben“ echt auf den Keks.*⁹

lit.: “To me goes the whole regulating, scheming, tricking, and the dictating ‘from above’ really on the cookie.”

‘All the regulating, scheming, tricking, and the prearrangements from above are really getting on my nerves.’

Formations on *-ung* attain the highest score in web occasionalisms. This may indicate that there is only a marginal potential for the according formations, so that only very few speakers actually coin these derivatives. The respective words are typically only marginally acceptable and/or are meant as playful formations, cf. (3).

(3) *versicherung? nur kicherung* ‘insurance? only snickering’¹⁰

⁹ <<https://eu.battle.net/forums/de/hearthstone/topic/10615414982>>, accessed in August 2016.

¹⁰ part of a poem about the horrors of being a builder-owner, <<http://www.zwoelfzeilen.com/2010/11/27/bauen-grauen/>>, accessed in August 2016.

As for the constraints, we will begin with the most restricted schema, *Ge-X-e*. One fairly strong constraint is of prosodic nature: generally, the bases need to bear the main stress on the first syllable (cf. Olsen 1991: 353; similarly Motsch 2004: 334, Fleischer & Barz 2012: 266). This holds for 80 of the 83 attested *Ge-X-e* formations in our sample. The constraint is violated in three types that are attested only in the web data:

- (4) *kombinieren* ‘to combine’ → *das Gekombiniere*¹¹ ‘continuous/repetitive combining_{EVAL}’
- (5) *begutachten* ‘to survey’ → *das Gegutachte*¹² ‘continuous/repetitive surveying/inspecting_{EVAL}’
- (6) *begrüßen* ‘to greet’ → *das Begrüße*¹³ ‘continuous/repetitive greeting_{EVAL}’.

In the last two formations, the speakers omitted either the prefix of the base (example (5)) or the front part of the circumfix (example (6) as well as the formation *bestimme* in (2), which is not part of our data but happened to appear in the context) – presumably to avoid stacking of unstressed syllables. The formations do not appear to be errors, but rather instances of stretching the schema to its margins; this native speaker intuition is corroborated by the observations that example (5) occurred in double quotes and example (6) has likely been produced by a teenage author.¹⁴

11 *Das ganze leidige Gekombiniere und das unübersichtliche Waffenetune sagen mir auch überhaupt nicht zu.* ‘All the exasperating combining and the confusing tuning up of weapons do not appeal to me either.’ <<http://residentevilzone-forum.de/index.php?page=Thread&postID=16216>>, accessed in August 2016.

12 *Und erst einmal muß dieses ganze „Gegutachte“ auch erst einmal sacken* ‘And first of all, all this inspecting (i.e. having been inspected) has to be processed first of all.’ <<https://meinekleinechaosweltblogspotde.wordpress.com/2017/01/31/der-fels/>>, accessed in June 2017. An anonymous reviewer points out that the base verb may as well be *gutachten* ‘to review’, in which case no prefix had been dropped. A DWDS query, however, shows that the prefixless verb has drastically dropped in frequency and become almost extinct (<<https://www.dwds.de/r/plot?xrangs=1600:1999&window=10&slice=3&q=gutachten&corpus=dta%2Bdwds>>, accessed June 30, 2018).

13 *Kurz darauf kam er mit Simon und Hallodri wieder und das ganze Begrüße setzte sich fort.* ‘Shortly after that, he came back again with Simon and Hallodri and all the repeated greetings continued.’ <<https://www.fanfiction.de/s/546cf37d000365401035bfbe/37/Verliebt-auf-dem-Roadtr7p>>, accessed in August 2016.

14 The user profile specifies the age as 18 years (<<https://www.fanfiction.de/u/Todesruf>>, accessed in March 2018), and also the topics and the style of the story

This constraint accounts for 27 of the 37 base verbs that were not attested with *Ge-X-e*, including verbs with unstressed prefixes (*versuchen* ‘to try’, *beraten* ‘to consult’) and verbs with the stressed suffix *-ieren* (*sanieren* ‘to renovate’). In addition to prosodic restrictions, there are semantic factors at work: Olsen (1991: 353) states that *Ge-X-e* favors perceivable actions that are durative or can be iterated. This is corroborated by the fact that among the 30 types in the original sample of *Ge-X-e*, 18 end in *-eln* or *-ern*, which generally indicate iterative actions, e.g. *brummeln* ‘to mutter’, *rasseln* ‘to rattle’. Harden (2003: 128f.) describes the preferred group of base verbs as “Tätigkeitsverben” ‘activity verbs’, excluding, however, those activity verbs that involve an affected object. Furthermore, he remarks in a footnote that imperfective verbs (especially iterative verbs) were better suited than perfective ones. We opt for applying the terms *atelic/telic* instead – which is also more commonly used for action semantics/*Aktionsarten*. The actions described by telic verbs have an intrinsic limit or result, while those described by atelic verbs do not (Garey 1957: 106, Filip 2011: 1186). This dichotomy also covers the aspectual part of Olsen’s (1991: 353) observations (we will get back to the feature “perceivable” below): durative or iterated actions are atelic. We can thus rephrase: *Ge-X-e* favors atelic base verbs.

To test this assumption, we annotated all base verbs for their telicity. Telicity can be gauged, e.g., by applying a test that originally goes back to Klein (1974: 106–107, cf. Comrie 1976: 40): If someone was Xing and got interrupted, have they Xed? For atelic verbs – in our sample, e.g. *schlemmen* ‘to feast’ – the answer is yes, while for telic verbs – in the sample for *-ung*, e.g. *einordnen* ‘to file sth., to classify’ – the answer is no.

The assumed preference of the *Ge-X-e* schema for atelic verbs can be confirmed. In fact, all 30 verbs in the original sample are atelic. More precisely, all verbs are activities in Vendler’s (1957: 144) system of verb classes, as they involve a perceivable period of time. The feature +/-duration, however, turned out not to be particularly relevant: Among all 120 base verbs, only two could be considered as punctual (*gelingen* ‘to work out, to be a success’ and *treffen* ‘to meet, to hit, to strike’). We will thus confine ourselves to the atelic/telic distinction.

The preference for atelic verbs is very likely connected with the prosodic constraint described above: The prosodic constraint rules out prefixed verbs. Since verbal prefixes in German mostly yield telic verbs (cf. the overview in Motsch 2004: 153–154), many telic verbs are excluded due to the prosodic constraint. This does not entail that a disinclination towards telic verbs should

suggest a juvenile writer. A speaker’s young age may well increase their inclination to coining marginal formations, since the overall language data they have experienced is smaller as yet than with older speakers.

not be a factor in its own right (see below), but rather that there is a convergence between formal and functional factors.

Telic verbs are often not attested with *Ge-X-e* at all (in our sample: 23 verbs, including 7 verbs not ruled out prosodically, e.g. *gründen* ‘to found’, *lösen* ‘to solve’) or only in the web data (14 verbs), while none were attested in the corpus. In the cases where telic verbs do combine with the *Ge-X-e* circumfix, their meaning is coerced into an iterative reading (aspectual coercion, see, e.g., Audring and Booij 2016: 621f.), which is often additionally supported by adjectives like *ständig* ‘permanent(ly)’ (cf. (7)) or *ganz* ‘all [the Xing]’ (cf. (2) as well as footnotes 11, 12, and 13).

- (7) [...] *udn* [sic!] *ich bin mir 100% sicher, dass mir das ständige nächtliche eingeatme des Staubes meine Rattenallergie beschert hat!*
 ‘[...] and I am a hundred percent certain that the permanent inhaling of dust at night has caused my rat allergy (lit.: bestowed my rat allergy on me)’
Eingeatme ← *einatmen* ‘to breathe in’¹⁵

Both observations – the unattestedness of telic verbs in many cases and the coercion into iterative readings in others – point to an imperfective meaning of the *Ge-X-e* schema, putting it in a functional opposition especially with the *-ung* schema, which will be addressed next.

For *-ung*, which is the second most restricted schema (Figure 3), we find a partially complementary picture: *-ung*-nominalization appears rather reluctant to combine with *-eln* or *-ern* verbs (cf. Demske 1999: 109, Fleischer and Barz 2012: 226). This accounts for 10 of the 26 gaps. More generally: 22 of the 26 gaps pertain to atelic verbs, e.g. *schlappen* ‘work/behave sloppily’, *klirren* ‘to jangle’, *tun* ‘to do’. This observation may indicate that present day *-ung* derivation has a strong preference for telic verbs (indeed, 21 of the 30 original types are based on telic verbs; Demske (forthc.) presents similar results: 74% of the *-ung*-nominals in her corpus study are derived from telic verbs). There is a number of *-ung* formations based on atelic verbs in our data, but they are generally subject to special conditions: Often, they are lexicalized remnants of looser constraints in earlier centuries,¹⁶ e.g. *Schwankung* ‘fluctuation’ (since at least 1600, based on *schwanken* ‘to fluctuate, wobble, stagger’); in other cases, they may be licensed by contexts that evoke a summary perspective (cf. the coordination in (8) or the intended event reading in

15 <<http://www.tierforum.de/t133054-rattenkaefig-schlafzimmer.html>>, accessed in August 2016.

16 cf. Demske (2000: 398, 403), Hartmann (2016: 264).

(9); both (8) and (9) are only marginally acceptable – cf. the double quotes in (9), which is also playful formation).

(8) *Die Gefahr ist, ob Schwärmung oder Beurteilung, man verliert den Überblick*

‘The danger is, whether romanticizing or judging, one loses track’¹⁷

(9) *Eine “Schunkelung” soll’s werden und keine Sitzung*

‘A “Schunkelung” it shall be, not a session’

Schunkelung ← *schunkeln* ‘to sway to music while sitting down, arms linked with the people to the left and right’ in analogy to *Sitzung* ‘session’¹⁸

The third most restricted (or rather: second least restricted) schema, *-erei*, displays only seven gaps. There do not seem to be any pronounced constraints (Motsch 2004: 334–335 and Fleischer & Barz 2012: 199 do not list any). Some of the unattested cases pertain to infrequent or stylistically marked verbs (e.g. *darbieten* ‘to present’ (archaic/high register), *wogen* ‘to welter’ (poetic)),¹⁹ others denote an intrinsically positive event (cf. *gelingen* ‘to work out, to be a success’). These bases may not be readily compatible with the evaluative flavor of the schema.²⁰ By contrast, verbs denoting an action deplored on moral grounds (*hehlen* ‘to handle stolen goods’, *prügeln* ‘to club’) or expressing pejorative evaluation (*schuften* ‘to drudge’, *frömmeln* ‘to be sanctimonious’) display an affinity to *-erei* (12 verbs in the original sample, compared to 9, 4, and 1 in the samples of *Ge-X-e*, *-ung*, and *NI*).

Our data conform to an interesting difference in the preferred base verbs of *Ge-X-e* and *-erei* observed by Dammel and Quindt (2016: 54–55) for historical data (1350–1850): While *-erei* shows an affinity to morally deplored actions, *Ge-X-e* focuses on immediately perceivable (very often: audible) actions instead – as has also been observed by Olsen (1991: 353) –, e.g. *plätschern*

17 <<http://astrowoche.wunderweib.de/partnerhoroskop-steinbock-wassermann-was-wird-das-fuer-ein-paar-555.html>>, accessed August 2016.

18 Cosmas corpus, newspaper Rhein-Zeitung, February 5th 2001, quoting the head of a carnival club; translation of *schunkeln*: <<https://dict.leo.org/englisch-deutsch/>>, accessed in June 2017.

19 Olsen (1991: 353) expresses a similar observation with respect to *Ge-X-e* formations.

20 Another factor may be a lack of intentionality that can be observed for *gelingen* ‘to work out/to be a success’ as well as for *ausbleiben* ‘to fail to appear’, which is attested only in a web occasionalism.

‘to patter, to splash’, *reden* ‘to talk’, *zwitschern* ‘to chirp, to twitter’. This leads to differing output semantics in that *Ge-X-e* formations tend to denote immediate, present disturbances, while *-erei* formations tend to denote actions that are viewed in a summary rather than a momentary perspective, e.g. *Frömmelei* ‘sanctimony’, *Heblerei* ‘(habitual) handling of stolen goods’. The schemas thus show a time-stable division of labor – a feature characteristic of word formation paradigms (cf. section 1).

The nominalized infinitive, finally, appears to be fully productive (as stated in the literature, e.g. Motsch 2004: 329): all of the 120 bases were attested in either the corpus or the web data, all of them more than just once or twice. Despite being compatible with any verb, the schema can be assessed as somewhat complementary to *Ge-X-e* and *-erei*: The original sample of 30 does not contain a single *-eln* or *-ern* verb and only one verb denoting a negative action (*hauen* ‘to beat so.’). Table 6 gives a résumé of the affinities and constraints described so far.

Tab. 6: Overview of input constraints and base affinities of the four schemas.

	Imperfective (action, process)	Perfective (event, result...)
Descriptive/ neutral	NI (<i>Forsch</i>) en (‘researching’) <ul style="list-style-type: none"> • fully productive • compatible with (but not specifically inclined to) negative/pejorative verbs or <i>-eln/-ern</i> verbs 	(Forsch) ung (‘research’) <ul style="list-style-type: none"> • affinity to telic verbs • atelic verbs (including <i>-eln</i> and <i>-ern</i> verbs) only in lexicalized cases or specific licensing contexts
Expressive/ evaluative	Ge (<i>forsch</i>) e (‘researching _{EVAL} ’) <ul style="list-style-type: none"> • strong prosodic constraint: main stress on first syllable • strong affinity to atelic verbs, including <i>-eln</i> and <i>-ern</i> verbs (iterative) 	(Forsch) erei (‘research _{EVAL} ’) <ul style="list-style-type: none"> • poor compatibility with high register verbs • relatively high affinity to verbs describing negative action or bearing pejorative evaluation

Overall, the findings match the characteristics of the schemas hypothesized in Section 1, yet they call for some specification of the concept of paradigmaticity in word formation. In line with what is known about word formation vs. inflectional paradigms, the cells in the present word formation paradigm are much less available than the cells of an inflectional paradigm would be. Both the affinities and the constraints seem to limit the free availability of the cells. Empirically, some phenomena are hard to classify as either a constraint or an affinity. For instance, it is not clear whether *-ung* derivation is restricted to telic verbs or just inclined towards them – especially since historical layers blur the picture. Theoretically, it is interesting to consider both separately: Hard constraints would obstruct the functionality of the paradigm. The function usually

expressed by the restricted schema would not be available for the excluded bases, or it would have to be expressed by another schema, thus blurring the clarity and predictability of the paradigm as a whole. Thus, hard constraints undermine the potentiality – a feature we already pointed out to be crucially important for word formation paradigms (cf. Section 1, Štekauer 2014: 369).

Turning back to our data, the limitation of the *Ge-X-e* schema to bases with the main stress on the first syllable appears to be the clearest case of an input constraint. It is now crucial to consider that in non-edited writing, the constraint is violated repeatedly (see above, *Gekombiniere*, *Gegutachte*, *Begrüße*, *Bestimme*). Apparently, the need to use the schema was stronger than the constraint. The fact that the schema was stretched to its margins and that speakers did not resort to using one of the other schemas indicates that native speakers have an intuition about the functionality of the schema and of the paradigm. Neither does the constraint prevent perceiving the paradigm (static aspect, cf. Štekauer 2014: 362), nor does it keep speakers from forming words accordingly (dynamic aspect).

In addition to constraints, the affinities between certain bases and certain schemas seemingly conflict with ideal paradigmaticity: Table 6 indicates partially complementary distributions of bases (e.g. affinity between *Ge-X-e* and *-eln/-ern* verbs, affinity between *-ung* and telic verbs). This may appear to be quite different from canonical inflectional paradigms where any given stem of the relevant part of speech can appear in every cell of the paradigm. At a closer look, however, the differences turn out to be only gradual. In inflection, too, certain affinities between specific stems and specific paradigmatic cells can be observed. For instance, concrete nouns occur in plural forms more often than abstract nouns or mass nouns (which may not occur in the plural at all, depending on the language). In both inflection and word formation, semantic-pragmatic factors can account for these affinities: Abstract nouns as well as mass nouns are intrinsically less countable than concrete nouns, since the concepts they denote are less clear-cut than concrete objects. In the present word formation paradigm, first of all, the affinities between negative/pejorative bases and the two schemas that serve an expressive function are not unexpected; they can be accounted for by the pragmatic need to make expressive statements about negative or pejoratively viewed actions. Similarly, atelic and iterative verbs match the pluractionality of the *Ge-X-e* schema. Unfinished or repeated action, too, is more prone to being talked about in an expressive manner (see Dammel and Quindt 2016: 68, 70; Tovena 2015: 109). Conversely, telic verbs match the *-ung* schema, which typically assumes a summary or result perspective of the action.

Overall, affinities (and repulsions) play an ambivalent role in the word formation paradigm. On the one hand, as we have just described, the affinities can be accounted for by semantic-pragmatic factors. This means that the

system is generally open for combinations other than the preferred ones. Importantly, the paradigm maintains its functionality even with atypical bases. Examples are cases where telic verbs are coerced into an iterative reading when involved in a *Ge-X-e* formation (as in (7)); cases where atelic actions are viewed in a summary perspective when involved in an *-ung* formation (as in (8)); finally, cases where neutral actions (expressed by neutral verbs) gain an expressive flavor when involved in a *Ge-X-e* or *-erei* formation (see Section 3.2).

On the other hand, base verbs do occur in a partially complementary distribution – especially in the original random samples. Their meanings contribute to the function of the schemas. For instance, series of verbs denoting morally deplored actions (*Geld schieben* ‘to move illicit cash’, *Geld waschen* ‘to launder money’, *hehlen* ‘to handle stolen goods’, *prügeln* ‘to club’, *raufen* ‘to tussle’ – all in our sample) support the pejorative potential of the schema *-erei* (for a theoretical account cf. Riehemann’s 1998 and 2001: Ch. 7.6 *Type-based Derivational Morphology*, an early version of *Construction Morphology* (Booij 2007, 2010, Kempf 2016a: Ch. 2.4, 2016b: 145)). Both aspects of affinities can be accommodated in a model which acknowledges that word formation paradigmaticity begins on the level of input selection. This idea, again, supports the view that potentiality in word formation paradigms plays a more important role than actualized words (cf. Bauer 1997: 253).

3.2. Output concepts

In this section, we regard the output concepts produced by the four derivation schemas and ask whether it is adequate to analyze them as systematically related from a functional perspective. For this analysis, we drew a sub-sample of only the four-member sets (including occasionalisms from the web; N=58 word formation sets). We tested their functional paradigmatic relations regarding a) output concept and b) speaker evaluation.

For the output concepts, we used and modified a scale proposed by Hartmann (2013: 102, 2016: 268–271) based on Ross’s nouniness squish and on categories from Cognitive Grammar, see (10).

- | | | |
|-------------------|--------------------------------|--------------------------------|
| (10) ACTION | EVENT/RESULT | ENTITY (place, object, person) |
| Process > Habit > | Bounded Region in Time (BET) > | Bounded Region in Space (BRS) |

On this scale ranging from ACTION to ENTITY, we distinguish between *Process* denoting imperfective actions, *Habit* denoting habitual/professional actions occurring regularly, *Bounded region in time* (BRT) with a summary perspective on the action including events and abstract results, and *Bounded*

region in Space (BRS), i.e. material entities such as places, objects, or persons (cf. Grimshaw 2011: 1298–1300 for similar distinctions). We classified the types based on their contexts in our random sample and checked additional contexts from our larger database. Secondary semantic change of word formation products from action to event and/or entity constitutes a common metonymic path in the development of action nouns that feeds back into word formation creating new output schemas (e.g., *Öffnung* ‘process of opening’ > ‘gap’, see Demske 2000: 396–398, Hartmann 2013: 103f.). Where more than one meaning was present, we classified the output meaning according to the rightmost type on the scale in (10). Considering speaker evaluation, we distinguished between neutral and evaluative output lexemes, again based on the corpus context and supported by additional contexts from our database and our intuition as native speakers. Both classifications, regarding output concepts and speaker evaluation, were annotated independently by two native speakers.

Figure 4 shows the actionality profiles for the four schemas from a semasiological perspective. NI focusses on processes, whereas *-ung* developed a new functional profile fed by secondary semantic change over time. It specializes on events and results. *-erei* is scattered across functions and more prone to denote habitual or institutionalized actions than *Ge-X-e*. In this respect, *-erei* resembles *-ung* more than the nominalized infinitive does, and *Ge-X-e* resembles NI due to its higher proportion of pure process readings (typically atelic activities in a concrete context), but it also covers habits and events. To a high extent, these tendencies are influenced by the differences in base selectivity (atelic vs. telic verbs) discussed in Section 3.1. NI is confirmed again as today’s most productive device in deriving pure action nouns.

Fig. 4: *Actional semantics of output forms (semasiological perspective), N=58 four-member sets = 232 types.*

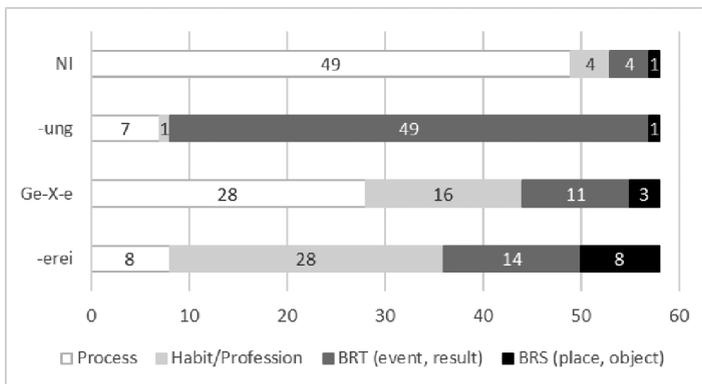
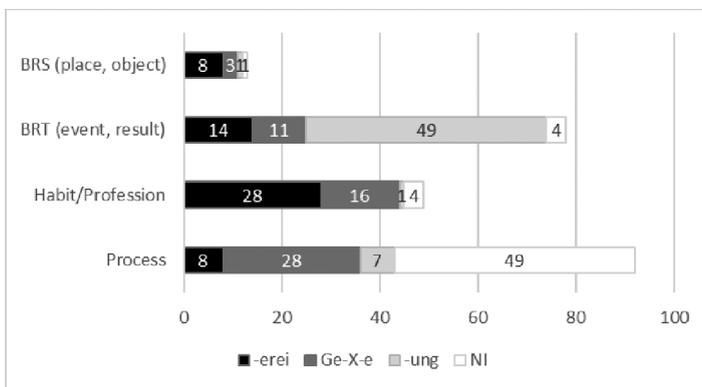


Figure 5 shows, from an onomasiological perspective, how the functional domains are covered by the four schemas. This diagram visualizes more clearly the functional dominance of NI in the process domain and of *-ung* in the event domain. The two other schemas are more widely scattered across functions, though *-erei* specializes in the habitual domain in our sample and stands back behind *Ge-X-e* in the process domain. The portion of bounded regions in space (BRS), i.e. objects and places especially with *-erei* is due to the existence of a productive locative schema for this suffix (e.g. *Denkerei* ‘think’+ *-erei* for the rooms of an organization dedicated to thinking about unresolvable problems).²¹

Fig. 5: Actional semantics of output forms (onomasiological perspective), N=58 four-member sets = 232 types.



However, this is merely the overall picture. If we regard paradigmaticity on the level of instantiations, we need to assess the members of each concrete word formation set for their systematic paradigmatic relationships. Again, this was done for all the four-member word formation sets (N=58). The result is that patterns were scattered. Overall, 25 different combinations occurred, most of them attested with less than five types. However, four constellations were attested as recurrent for 5, 7, and 10 types. Taken together, they amount to 50% of the sample. Table 7 shows the functional distributions for the three constellations and provides examples for each of them. Here, the overall picture is crystallized in its most systematic representations with NI and *Ge-X-e* specializing in processes, *-ung* in events and *-erei* yielding different kinds of outputs but concentrating more on the nouny side of the cline than *Ge-X-e* does.

21 <<http://www.denkerei-berlin.de/>>, accessed 2017-06-20.

Tab. 7: Recurrent paradigmatic constellations regarding action noun semantics.

number of word formation sets	NI	-ung	Ge-X-e	-erei
10	process <i>Hauen</i> 'action of chopping, striking'	event/result <i>Hauung</i> 'harvest of wood'	process <i>Gehaue</i> 'eval, action of beating (each other) repeatedly'	habit <i>Hauerei</i> 'eval, habit of beating others/ each other'
7	process <i>Spielen</i> 'action of playing'	event/result <i>Spielung</i> 'gaming event' web: playful formation analogous to <i>Lesung</i> 'reading session'	process <i>Gespiele</i> 'eval, action of playing'	event/result <i>Spielerei</i> 'eval, result of playful action'
5	process <i>Drehen</i> 'turning'	event/result <i>Drehung</i> 'turn'	process <i>Gedrehe</i> 'eval, repeated action of turning/ spinning'	place <i>Dreherei</i> 'turnery workshop'
7	process <i>Einreichen</i> 'action of submitting documents'	event/result <i>Einreichung</i> 'institutionalized action of submitting documents'	habit <i>Eingereiche</i> web: 'eval, repeated action submitting documents, annoying speaker'	habit <i>Einreicherei</i> web: 'eval, repeated action submitting documents, annoying speaker'

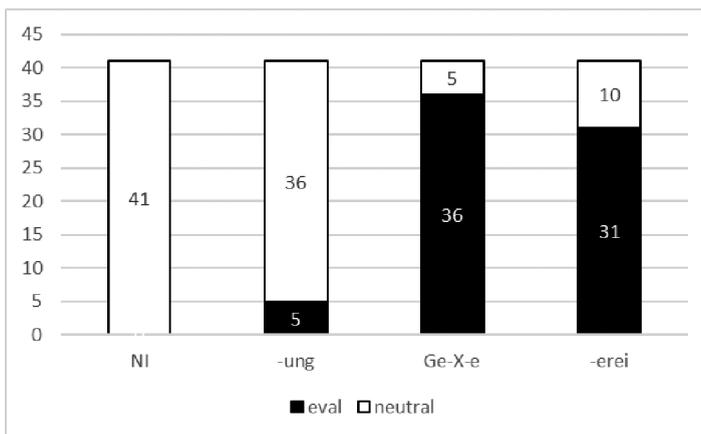
We can conclude for the actional semantics of output patterns that even though there is no clear-cut functional division of labor – this is blurred by diachronic layering and secondary semantic change –, a tendency to specialize on complementary functional niches can be confirmed.

Pluractionality may correlate with attitudinal meanings marking affective stance in the sense of Du Bois (2007: 162f.), which occur in different shades on an evaluative scale between attenuation and intensification, e.g. “many small phases (diminutive)”, “insufficient effort to produce a result (conative)”, “undirected effort (incassative)”, “less effort than expected (tentative)”, but also “plural actions carried out with an increased number or size of parts and deviant in some respect, e.g. in appropriateness (excessive)” (Tovena

2015: 109). Considering the question of speaker evaluation in the output, we restricted the subset of four-member word formation sets to bases that are neutral with respect to speaker evaluation (N=41), e.g. *einreichen* ‘to hand sth. in, to submit sth.’ (vs. *schlampfen* ‘to work slovenly’). This step was necessary because we wanted to assess the evaluative force of the word formation schemas as independently from base semantics as possible (see Dammel & Quindt 2016: 43, 64f. for discussion).

Speaker evaluation was annotated independently by two researchers who also checked the examples across different contexts in our database. The results from our sample (see Figure 6) confirm the assumption that *Ge-X-e* and *-erei* produce evaluative effects in opposition to *-ung* and the NI. The four expressive types in *-ung* are occasional playful formations from the web such as the above-mentioned *Schunkelung* (see example (9) in Section 3.1). The lower number of evaluative types in *-erei* compared to *Ge-X-e* is mainly due to layering with the locative sub-schema of *-erei*, which is still productive today and lacks negative evaluation (e.g. locative nouns *Wäscherei* ‘laundry, laundrette’ vs. *Wascherei* ‘washing_{EVAL}’, Olsen 1991: 352, Meibauer 2014: 2.2). The evaluative function is open to any new verb forming an action noun, satisfying the criterion of potentiality.

Fig. 6: Expressive effects in types of four-member word formation sets (N = 42 sets, i.e. 164 types).



So far, we have established that speakers make use of *Ge-X-e* and *-erei* to mark their attitudes towards the nominalized action. We will argue in the following that these evaluative functions are pragmatic meanings feeding on

the pluractional functions of *Ge-X-e* and *-erei*. Examples (11) and (12) for *schalten* ‘changing of gears’ illustrate this line of argumentation.

- (11) *Irgendwie nervt mich die Schalterei in der Stadt und das angefähre*
 ‘Somehow I am annoyed by changing gears_{EVAL} in town and by starting
 and stopping_{EVAL}’²²
 Descriptive: ‘Changing gears is more frequent and demanding in town.’
 Expressive: +>‘Speaker (S) is annoyed by frequent changing of gears’
- (12) *die Schalterei erfordert doch ziemlichen Kraftaufwand im Unterarm
 und im Bein, ist folglich nix für Warmduscher, und das ist gut so*²³
 lit: ‘the changing of gears_{EVAL} requires quite an effort in the forearm and
 leg, thus it’s not suited for softies, and that is a good thing’
 Descriptive: ‘Changing gears is hard in the car being reviewed.’
 Expressive: +> ‘S appreciates challenge, is impressed by car.’

While the presence of evaluation is due to the formative, the exact flavor of the evaluation is context-dependent. Often it is negative as in (11) (note also *angefahre* ‘stop-and-going_{EVAL}’ in the co-text), but it may also be appreciating as in (12). Being open for flavors in both directions of evaluative scales is a prototypical feature of evaluative morphology, evidenced, e.g., also in diminutives (cf. Fortin 2011: 150f. based on Potts 2007). This suggests an analysis at the interface of pragmatics and semantics. We propose that the evaluative effect can be calculated via generalized conversational implicature (GCI) based on Levinson’s (2000: 38f) m-heuristic derived from Grice’s maxim of manner. The m-principle is given in (13) (for other applications to word formation cf. Levinson 2000: 135–158, Meibauer 2014: 113–117, Dammel and Quindt 2016: 66–69).

- (13) The m-principle (Levinson 2000)
 “What is said in an abnormal way, isn’t normal; or Marked message indicates marked situation” (p. 33)
 “*Speaker’s maxim*: Indicate an abnormal, nonstereotypical situation by using marked expressions that contrast with those you would use to describe the corresponding normal, stereotypical situation.
Recipient’s corollary: What is said in an abnormal way indicates an abnormal situation, or marked messages indicate marked situations, specifically:

22 <<http://www.astra-g.de/archive/index.php/t-67610.html>>, accessed in August 2016.

23 <<http://autorevue.at/autowelt/neuer-ford-mustang-2015>>, accessed in August 2016.

Where S had said “p” containing marked expression *M*, and there is an unmarked alternate expression *U* with the same denotation *D* which the speaker might have employed in the sentence-frame instead, then where *U* would have I-implicated the stereotypical or more specific subset *d* of *D*, the marked expression *M* will implicate the complement of the denotation *d*, namely \bar{d} of *D*.” (pp. 136–137)

Ge-X-e and *-erei* fulfill several of Levinson’s criteria for marked messages (2000: 137): Formations containing them are “morphologically more complex”, as *-ung* and NI are less salient prosodically, the derived words are partly “less lexicalized [...]”, “less frequent or usual” (more occasionalisms from the web, see 3.1), and certainly “less neutral in register” than the other two schemas. Moreover, they have the additional feature ‘pluractional’, which is not present in *-ung* and the NI.

We illustrate the calculation based on the m-principle reusing example (12, repeated):

- (12) *die Schalterei erfordert doch ziemlichen Kraftaufwand im Unterarm und im Bein, ist folglich nix für Warmduscher, und das ist gut so*
 ‘the changing of gears_{EVAL} requires quite an effort in the forearm and leg, thus it’s not suited for softies, and that is a good thing’

The speaker indicates an abnormal kind of changing gears by using *Schaltere* instead of the NI *Schalten*, which would have been the normal choice to describe the action. By this, they implicate an evaluation of the action as not matching the stereotyped action schema of *schalten*. Note that there is no reference in the context to repetitive action. In the frequency of changing gears, the tested car does not differ from any other kind of automobile. Thus, the literal meaning of pluractionality is backgrounded in this example. The concrete appreciative meaning, which is unusual with *-erei*, can be calculated via particularized conversational implicature relying on the context. This process could also be described in terms of coercion in the sense of Audring & Booij (2016: 617). Readers interpret the unexpected derivational shape of the action noun as a hint that the quality of the action is evaluated as deviating and look for specifying cues in the context. The reasoning for example (11) would be the same in the first part, but the second part would rather be the standard GCI meaning of negative evaluation implied with *-erei*.

The implicature of negative evaluation first arose based on the pluractionality in the semantics of *Ge-X-e* and *-erei* (much is too much), but in the meantime, it has been conventionalized to such a degree that the evaluative implicature can arise through the m-principle alone with a pejorative

default meaning of deviation from the action stereotype. Though contexts of repetition or collective action clearly dominate as contexts of pragmatic productivity in the sense of Meibauer (2012: 26), there are examples such as (12) and (14), which show that pluractionality is not a necessary ingredient for pejoration anymore. Example (14) from a late nineteenth-century guidebook on etiquette attests a pejorative function for *Esserei* (based on *essen* ‘to eat’) without a cue of pluractionality in the preceding context. *Esserei* is used generically for the action of inadequate eating using fingers instead of adequate cutlery in paradigmatic relation to *Essen*.

- (14) *Bei gewissen Speisen ist es nicht möglich, dieselben anders, als mit Gebrauch der Finger zu essen, z. B. Krebse und dergleichen und Artischocken. Ein schöner Anblick ist aber solche Esserei nie [...].* ‘Certain dishes are impossible to eat without using fingers, e.g. crayfish and similar and artichokes. Such an “eatery” never is a pretty sight [...].’²⁴

The calculation of the evaluative functions via Levinson’s m-principle is a crucial piece of evidence regarding the question of paradigms in word formation: The decisive precondition for the calculation of the evaluative meanings occurring with *Ge-X-e* and *-erei* is their **systematic opposition with neutral formations** (here NI, in other cases also *-ung*). This point is an important argument in favor of word formation paradigms because it means that the evaluative function crucially relies on the paradigmatic opposition with neutral formations.²⁵

3.3. Summary and discussion of our case study

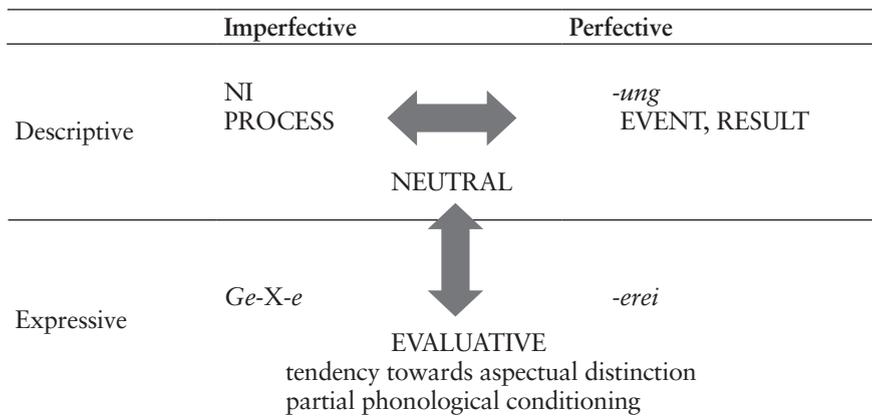
Our overall findings are summarized in Table 7. Regarding aspectual functions, our random sample confirms a distinction between process perspective for the nominalized infinitive and summary perspective for *-ung* (cf. Demske 2000: 394, Hartmann 2013: 98). One reason for this is the base selectivity of *-ung* favoring telic verbs at the input level (**Schlafung* ‘sleeping’) observed in 3.1. That the nominalized infinitive is in no way restricted and allows atelic and telic bases alike creates a (lopsided) intersection of shared bases, however. On the output level, the aspectual opposition becomes manifest in the tendency of *ung*-formations towards more nouny output semantics. Secondary semantic

24 Example from Alban von Hahn (1889): *Der Verkehr in der Guten Gesellschaft. Ein Buch über Lebensart und feine Sitte*. 2nd ed. Leipzig.

25 Van Marle (1985: 86) makes a similar point in his analysis of Dutch adjectives in *-ig/-erig* (which mark degrees of subjective relativization): “the semantics of these sets of words cannot be fully understood without taking the semantics of the other into consideration.”

change has led to new derivational sub-schemas denoting institutionalized events and entities (e.g., *Lesung* ‘reading event’, persons and instruments such as *Bedienung* ‘waiter/waitress’ and *Fernbedienung* ‘remote control’ from *bedienen* ‘to serve s.o./to operate’; Demske 2000: 396–398, Hartmann 2013: 101–104, 2016: 264–266). *Ge-X-e* vs. *-erei* show a broad intersection of possible bases on the input level. *Ge-X-e*, however, favors atelic verbs, *-erei* has no input restriction of this kind. Thus, there is no perfectly symmetric opposition between NI : *-ung* and *Ge-X-e* : *-erei* where actional features on the input level are concerned, but aspectual preferences are observable as tendencies in the output. Expressivity provides a more clear-cut distinction. (Mostly negative) speaker attitudes are systematically conveyed by formations in *Ge-X-e* and *-erei* as opposed to NI and *-ung*, and their conveyance relies on the paradigmatic opposition to the neutral alternatives. Thus, we can conclude that German action nouns indeed constitute a good exemplar of a word formation paradigm.

Tab. 7: Summary of generalizations from random paradigmatic samples.



The phonologically conditioned division of labor between *Ge-X-e* and *-erei* in the evaluative subparadigm calls for some further discussion: The clearest conditioning factor precluding the choice of the circumfix is the prosody of the base. *Ge-X-e* is generally incompatible with bases beginning with an unstressed syllable. This restriction is independent of the part of speech, as it occurs in the *ge*-prefix of past participle forms of German verbs as well: *ge-* can only be realized if there is no unstressed first syllable present (cf. *lernen* – *gelernt* ‘learn – learned’ vs. *studieren* – *studiert* ‘study – studied’). The fact that the phonological restriction on *Ge-X-e* is embedded in an overall restriction on *ge*-prefixes insensitive to word class speaks in favor of a phonological analysis that does not affect the word formation paradigm at hand.

Another observation worth discussing is that in word formation paradigms, variants of two schemas drawing on the same base with minimal semantic distinction (e.g. *Gesinge*, *Singerei* ‘singing_{EVAL}’) are not uncommon. This is a gradual difference from inflectional paradigms. A corresponding case in inflection would be for instance plural doublets such as German *Worte* and *Wörter* ‘words’, *Dinge* and *Dinger* ‘things’. In this case, however, one paradigmatic cell is shared by two variants, while the derivational variants can be seen as an overlapping area of different functional niches. In inflection as well as in word formation, diverging context preferences and secondary semantic differentiation are not uncommon. The above-mentioned plural doublets, for instance, have developed a distinction of ‘distributive’ vs. ‘collective’ (cf. Nübling to appear), as our derivation schemas *Ge-X-e* and *-erei* may differ in processual vs. eventive pluractionality (e.g. *Gemogle* ‘activity of cheating’ vs. *Mogelei* ‘habit/result of cheating’), cf. Kurth (1953b: 446f.).

Having argued how the differences between inflectional and word formation paradigms are rather gradual than categorial – and therefore no actual arguments against a paradigmatic view of the case at hand –, we will now summarize the evidence in favor of viewing the four schemas as a word formation paradigm, including some open questions.

1. **Large number of paradigmatic sets.** When web data is included, half of the 120 bases investigated are part of a full four-member set, and 93% of the bases are part of a set of at least three members. Additionally, the functional output analysis in Section 3.2 provided evidence for systematic correlations regarding telicity and +/-evaluation. Arguably, there is quite sufficient systematic data for speakers to form an abstract paradigm in their constructicon. This assumption, of course, could receive more substantiation by contrasting data, i.e. if other groups of word formation schemas were shown to exhibit comparatively less complete sets. Fully comparable studies remain to be carried out yet, but we suspect that examples of non-paradigmatic (or less paradigmatic) schemas could be found e.g. in German adjectival derivation (cf. the cases analyzed in Pounder 2000: e.g. 254, 260, 266 – where each base noun is shown to engage in a different combination of suffixes or word formation functions, often including multiple synonymies such as *meister-lich* and *meister-haftig*, both meaning ‘like a master, expertly’, ‘of a master’, or ‘from or by a master’, p. 254).
2. **Diachronic stability.** We indicated above (Section 3.1) how *Ge-X-e* and *-erei* display a time-stable division of labor (with *Ge-X-e* denoting actual disturbances and *-erei* referring, in a more general way, to morally deplored actions). The aspect of diachronic stability would need more systematic inquiry – in general, as well as in German action nouns. A related aspect to

be investigated is the question of open vs. closed systems: In paradigmatic groups of word formation schemas, we would expect less fluctuation of schemas than in other sub-systems of the word formation of a given language where schemas interact in a less systematic way.

3. **System-compatible overexpansion of schemas.** In Section 3.1, we demonstrated how the prosodic constraint on *Ge-X-e* formations is repeatedly and systematically violated in non-edited data (*Gekombiniere*, *Bestimme* etc.). Special circumstances, such as informal contexts, juvenile authors, or the use of double quotes indicate that speakers, overall, may very well be aware of the ill-formedness of such words. The fact that this kind of data can be found nonetheless indicates a strong pragmatic need to access the schema and thus points at its distinctive function within the paradigm. A similar case in point are the *-ung*-formations derived from atelic verbs. Again, special licensing contexts and/or double quotes (cf. *Schunkelung* in (9)) could be observed – indicating marginal acceptability. Nevertheless (i.e. despite the low compatibility of atelic verbs with *-ung*), speakers did coin these words, which, again, points at the need to access this particular cell of the paradigm.
4. **Coercion.** When semantically untypical verbs are derived by a schema, coercion effects occur: In Section 3.1, we observed how telic verbs attain an iterative reading when they are derived by *Ge-X-e* (e.g. *Eingeatme* ‘repeated inhaling’). This phenomenon parallels what Booij (2016: 440–441) observes in inflectional paradigms (e.g. where abstract nouns receive a “type of” interpretation when they occur in the plural form, e.g. *Englisches*). The coercion effect emphasizes the specific semantic profile of the schema, which overrides the default reading of the base verb. Presumably somewhat more than in inflection, we are looking at partially complementary affinities (e.g. atelic verbs + *Ge-X-e*, telic verbs + *-ung*, see Table 6). Yet, the cases of overexpansion (as in argument 3. above) show that the cells of the paradigm remain, by and large, available if a pragmatic need for the formation arises. Moreover, coercion effects demonstrate that the paradigmatic (aspectual and evaluative) functions are stable even if the base verb does not support them.
5. **Functions that depend on paradigmatic oppositions.** In Section 3.2 we argued that the evaluative functions of *Ge-X-e* and *-erei* arise in modern German as Generalized m-Implicatures that crucially rely on the opposition of these two patterns to the two normal patterns NI and *-ung*. The original importance of the pluractional semantics of *Ge-X-e* and *-erei* in the rise of evaluative functions has faded, while paradigmatic relations transporting the evaluative function in opposition to the normal patterns have been strengthened.

4. Conclusion about paradigmaticity in word formation

In this last section, we discuss general benefits and problems of a paradigmatic perspective on word formation based on the findings in our case study. Traits generally occurring with word formation meanings are present in the case at hand: limited semantic predictability, diachronic functional layering, and blocking. Should factors such as these – which are characteristic of word formation as opposed to inflection – preclude in general an analysis as paradigmatic? We would argue against such a preclusion.

In Section 1, we defined canonical word formation paradigms as systematic form-meaning oppositions between derivational schemas sharing bases. We pointed out that the question of relevance and adequacy of paradigms in word formation has both an empirical and a theoretical/methodological side. On the empirical level, a paradigmatic view has proven adequate to a reasonable degree (especially with respect to evaluation) – if diachronic layers are excluded. Along with this generally positive assessment, it must be kept in mind as a caveat that for this study we selected a particularly suitable sector of German word formation. A paradigmatic view may not be equally adequate for other areas of word formation. We maintain, however, that on a methodological level, a paradigmatic approach on derivational morphology is fruitful in any case. By directing attention to systematic gaps, correspondences, and affinities, a paradigmatic view crucially contributes to a thorough understanding of the productivity, constraints, and the division of labor in a derivational (sub)system. Beyond methodological advantages, a word formation theory incorporating paradigmaticity appears to model the construction most adequately, given the evidence listed above, especially of a) paradigmatic cells that are used despite formal base constraints and b) derivational functions (in our case: evaluation) that crucially depend on paradigmatic opposition. It remains to be investigated in more detail whether evaluative functions are generally better candidates for paradigmatic word formation (i.e. more prone to arise only in contrast to other (neutral) schemas).

As for comparing word formation and inflectional paradigms (cf. Štekauer 2015 for an overview), our case study confirms and also refines the differences known so far: Paradigmaticity in word formation starts on the level of input selection. It displays more gaps, stronger affinities, and more pronounced asymmetries in the productivity of different cells than typical inflectional paradigms do. Yet, the constraints do not necessarily impair the functioning of the paradigm, and the affinities differ only gradually from inflectional selectivity – seeing that both can be conditioned by semantic/pragmatic factors.

Further conclusions regarding methodological issues are that in investigating the paradigmatic relations of word formation schemas, it is interesting and important to take into account both actual and potential formations and

to compare the findings for each. That is what we did using cascading corpus searches starting from newspaper corpora and proceeding to increasingly informal resources and by taking a random, not a frequency guided sample as a point of departure. Another important distinction that should be regarded separately and more carefully than we could do here is the synchronic vs. diachronic perspective: a paradigmatic analysis of word formation schemas should focus on what is productive at the *same* point in time and should be supplemented with dedicated diachronic case studies that investigate the evolution and decay of paradigmatic systems in word formation.

Moreover, our data shows clearly that discourse domains matter, especially when it comes to investigating evaluative morphology. Evaluative morphology is not prominent in corpora of written standard language, and corpora of spoken German are still quite small. Thus, we emphasize the relevance of occasionalisms in investigating word formation paradigms, but as argued above, occasionalisms should be counterbalanced with data from established corpora. We saw that the completeness of the paradigms crucially depends on the choice of resources (here web data vs. newspaper corpora) and achieved a good impression of established, i.e. actuated and potential slots on the level of the speech community. We could observe that the schemas filling cells of word formation paradigms can show strong variation with respect to their distribution among styles and text types. This observation raises the question whether stylistic conditions should be part of paradigmatic descriptions in word formation. At first glance, this would be a clear difference to inflection. However, if we regard for example the distribution of perfect and preterite (past tense), communicative domains and registers may matter to a high degree in inflection as well.

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