The interplay of verb class, individual verb, and morphological process: a quantitative investigation into scalar *out*-prefixation

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out-prefixation

- Highly productive verbal prefix
- Introduces own argument structure and argument restrictions
- Overall constructional semantics contested, scalar-comparative meaning component undisputed

(1) We try to **outdrink our friends** and end up as alcoholics. (COCA)

(2) ??We try to **outdrink the beer**.

(see Ahn 2019; Kotowski 2020, Talmy 2000)

out-prefixation

$$
\text{SEM}\left[\begin{array}{l}
\textit{causation} \\
\text{ACTOR} \vee \text{UNDERGOER}\ \boxed{1} \\
\text{UNDERGOER}\ \boxed{2} \\
\text{CAUSE}\ \boxed{0}\ ! \left[\begin{array}{l}
\textit{eventuality} \\
\text{ACTOR} \vee \text{UNDERGOER}\ \boxed{1} \\
\text{M-DIM}\ \boxed{3} \left[\begin{array}{l}
\textit{scale type} \wedge \textit{dimension} \\
\text{DEG} \vee \text{CARD}\ \boxed{4} \left[\begin{array}{l} \alpha \\ \copyright_{s,Rel}\ (\boxed{4},\boxed{5})\ > \end{array}\right] \\
\text{THRESHOLD DEG} \vee \text{CARD}\ \boxed{5}\ \beta
\end{array}\right]
\end{array}\right] \\
\text{CORRELATE} \left[\begin{array}{l}
\textit{co-eventuality} \\
\text{ACTOR} \vee \text{UNDERGOER}\ \boxed{2} \\
\text{M-DIM}\ \boxed{6} \left[\begin{array}{l}
\textit{scale type} \wedge \textit{dimension} \\
\text{DEG} \vee \text{CARD}\ \boxed{7}\ \gamma
\end{array}\right]
\end{array}\right] \\
\text{EFFECT} \left[\begin{array}{l}
\textit{change-of-state} \\
\text{RES-STATE} \left[\begin{array}{l}
\textit{result state} \\
\text{UNDERGOER}\ \boxed{2}
\end{array}\right]
\end{array}\right] \\
\text{iff}\ \boxed{3} \simeq \boxed{6} \longrightarrow \boxed{7} \triangleq \boxed{5}
\end{array}\right]
$$

out-prefixation

- Scalar dimensions basis for comparison (e.g. SPEED or HEIGHT)
- One lemma $\neq$ one dimension; often underspecified
- Allows for assymetric comparison

(3) ...a backing singer must not try to **'out-sing' the lead vocalist** [...] producers will adjust vocal volumes... (iWeb)

(4) ...you can't deny their vocal abilities [...] nobody out there can **outsing them**... (iWeb)

(5) "I figured I'm not going to **outrun an eagle**, so we might as well just see what happens." (forbes.com)

(see Kotowski 2020)

Questions & problems

- Division of labor between base, base class, and constructional semantics?
- Do verb classes steer interpretation wrt which dimensions are accessed for comparisons?
- The degree of semantic coherence (Aronoff 1976): *out*-derivatives highly similar in general? Possibly more similar to each other than base-derivative pairs?
- Different from other prefixes in this regard?

This talk

Three studies that look at base-base, base-derivative, and derivative-derivative similarities

- Study 1: *out*-lemmas and the dimensions they encode
- Study 2 (distributional measures): does *out*- lead to higher degrees of similarity in derivatives?
- Study 3 (distributional measures): findings general features of prefixation? Comparison with other prefixes

Study 1: verb classes, tokens, and dimensions

- iWeb (Davies 2018)
- 3 classes (PERFORMANCE, RUN, EXIST) from VerbNet (Kipper et al. 2008)
- 100 items (if available) each of 4 verbs per class
- Hypothesis: dimension profiles of lemmas cluster per VN class

Class	Verbs of	Base verbs study 1
PERFORMANCE	Creation and Transformation	*dance*, *rap*, *sing*, *write*
RUN	Motion	*fly*, *run*, *sprint*, *swim*
EXIST	Existence	*live*, *survive*, *stay*, *wait*

Study 1: results

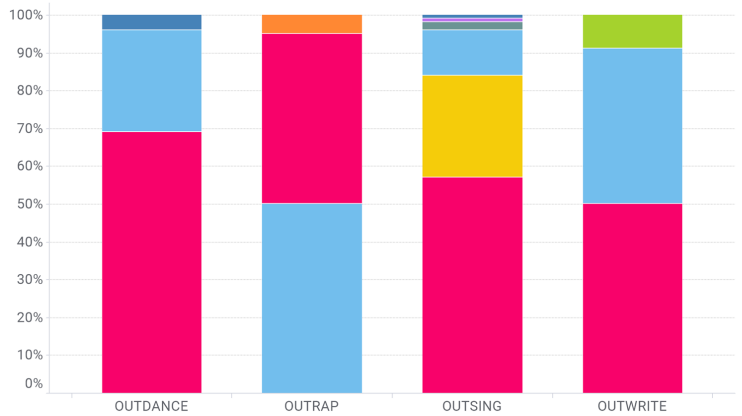

Figure: PERFORMANCE-lemmas

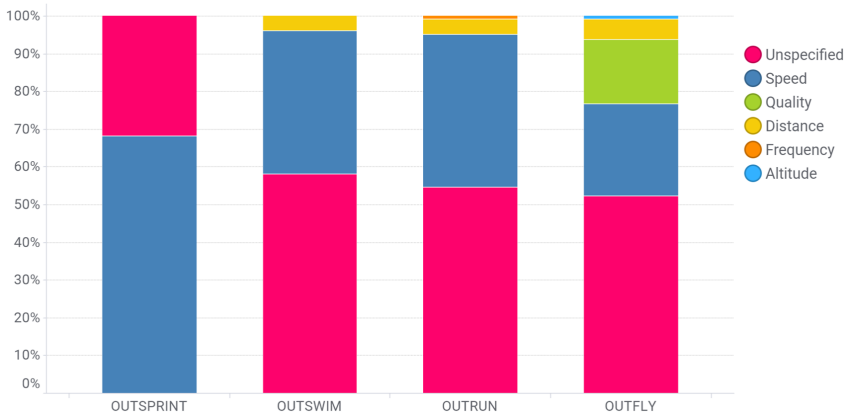

Figure: RUN-lemmas

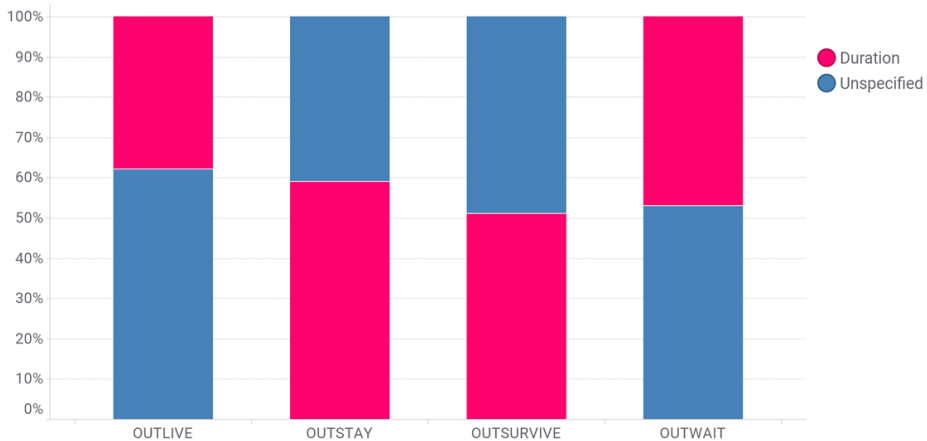

Figure: EXIST-lemmas

Study 1: discussion

- All classes: relative homogeneity wrt majority dimensions
- Attestations with unspecified dimensions follow majority dimension
- Each class: distinct dimension profile (items with less clear profile: cross-listing in other productive *out*-base class)
- Unclear: similar bases $\rightarrow$ similar derivative semantics via the dimension profiles?
- Not reflected: hypothesized effect of causative semantics of *out*-

$\longrightarrow$ **distributional similarity measures**

Study 2: *out*-, distributional similarities, and VN-classes

Distributional measures, calculated from ukWaC (Ferraresi et al. 2008) and iWeb

- Cosine similarities within and across VN classes
- Comparing base-base, base-derived, and derived-derived similarities
- Same classes and lemmas as in study 1
- Expectations
  - Derivatives relatively similar to each other
  - Effect even more pronounced within classes (dimension profiles)
  - Expected similarities: base-base $<$ derived-derived; base-derived unclear

Study 2: results & discussion

	RUN		EXIST		PERFORM		all items	
pairings	SIM	SD	SIM	SD	SIM	SD	SIM	SD
base-derived pairwise	0.08	0.02	0.05	0.00	0.05	0.02	0.06	0.02
base-derived pair-less	0.05	0.01	0.04	0.01	0.03	0.02	0.04	0.01
base-base	0.04	0.01	0.04	0.01	0.05	0.03	0.04	0.01
derived-derived	0.10	0.02	0.06	0.01	0.06	0.02	0.07	0.03

- **base-derived (pairwise)** more similar than **base-derived (pair-less)**: significant for all items + EXIST-class

$\longrightarrow$ Base semantics still relevant in derivative semantics

- **base-derived (pair-less)** less similar than **derived-derived**: significant for all but PERFORM-class
- **base-derived (pairwise)** less similar than **derived-derived**: not significant

$\longrightarrow$ Uniform semantics of derivatives

Study 3: distributional similarities *out-* v other prefixes

- General question: high degree of similarity for derived-derived feature of *out-* or general prefixation effect?
- Similarity measures for three further prefixes:
  - Spatial *over-* (+ RUN-class)
  - Reversative *un-* and iterative *re-* (both + TAPE-class)
- Different argument structural behavior than *out-*
  - *over-*: preposition incorporation (*fly over the field* $\simeq$ *overfly the field*)
  - *un-* and *re-*: no universal effects (*seal a gasket - unseal a gasket - reseal a gasket*)
- Expectation for all three prefixes: lower (relative) derived-derived similarities than for *out-*

Study 3: results

overfly, overrun, overdrive, overstep

	RUN (+ *out*)		RUN (+ *over*)	
	SIM	SD	SIM	SD
base-derived pairwise	0.08	0.02	0.06	0.02
base-derived pair-less	0.05	0.01	0.04	0.01
base-base	0.04	0.01	0.05	0.01
derived-derived	0.10	0.02	0.04	0.02

reseal, relock, rewind, refasten

unseal, unlock, unwind, unfasten

	TAPE (+ *un*)		TAPE (+ *re*)	
	SIM	SD	SIM	SD
base-derived pairwise	0.13	0.07	0.14	0.07
base-derived pair-less	0.06	0.02	0.07	0.02
base-base	0.07	0.02	0.07	0.02
derived-derived	0.05	0.01	0.09	0.03

Conclusions

- *out*-prefixation comes with verb-specific, class-specific, and construction-specific effects
- Study 1: dimension-based similarity for derivatives with same base class
- Study 2: base still semantically visible in derivative; however, derivatives semantically even more coherent
- Study 3: distributional behavior based on *out*-, not a general feature of prefixation (possibly down to *out*-'s applicative nature)

$\longrightarrow$ Similarity measures speak in favor of **word-formation process as most pronounced semantic contributor to out-derivatives**

THANK YOU

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VerbNet classes: dimension distribution