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The Problem of Distinguishing Between Homonymy and Polysemy in Dictionaries of Homonyms

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Abstract: One of the most persistent and practically consequential problems in lexicographic theory is the absence of a universally accepted procedure for separating homonymy from polysemy. The problem becomes especially visible in the compilation of homonym dictionaries, where every headword entry implicitly embodies a classificatory decision: treating two meanings as independent homonyms rather than as related senses of a single polysemous word reshapes the entire macrostructure of the dictionary and affects how the resource is used by translators, language learners, and computational systems alike. Despite decades of scholarly attention, lexicographers continue to rely on heterogeneous and often incompatible criteria—etymological, semantic, distributional, and morphological—and the resulting dictionaries routinely contradict one another on borderline cases. The aim of this study is to investigate the nature and scope of these inconsistencies by conducting a systematic comparative analysis of four influential homonym dictionaries of Russian and English, to identify the theoretical sources of disagreement, and to develop an integrated diagnostic procedure that combines multiple criteria into a transparent, reproducible decision-making protocol. A corpus of 150 contested lexical pairs was extracted from the four dictionaries and subjected to a five-parameter evaluation that included etymological tracing, synchronic semantic distance measurement through componential analysis, derivational paradigm comparison, collocational profiling based on the Russian National Corpus and the British National Corpus, and syntactic frame analysis. The results showed that 46.7 percent of all contested pairs received inconsistent treatment across dictionaries, and that the inconsistencies were overwhelmingly attributable to the isolated application of a single criterion rather than a balanced consideration of multiple types of evidence. When the proposed integrated procedure was applied, classification accuracy—measured against a gold standard established by expert consensus—reached 91.3 percent, and inter-annotator agreement among three independent lexicographers rose from a Cohen's kappa of 0.52 to 0.84. These findings demonstrate that a principled multi-criteria approach can substantially reduce the subjectivity that currently undermines the reliability of homonym dictionaries, and they point toward a more transparent and empirically grounded lexicographic practice.

Keywords: Homonymy, polysemy, lexicographic classification, homonym dictionaries, semantic distance, corpus-based analysis, componential analysis.

Introduction: The relationship between homonymy and polysemy has occupied linguists and lexicographers for well over a century, and the debate shows few signs of resolution. At the most basic level, the distinction appears straightforward: polysemy describes a single word with several related meanings, whereas homonymy describes two or more different words that happen to share the same phonological and orthographic form [1, p. 34]. A classic textbook example of polysemy is the English word "head," whose

senses—body part, leader, top of a nail, foam on beer—can be connected through a traceable chain of metaphorical and metonymic extensions. A classic example of homonymy is "bank," where the financial institution and the edge of a river share nothing beyond their spelling. In theory, the difference is categorical; in practice, it dissolves into a continuum of graded cases that resist clean classification.

The difficulty is not merely theoretical. It has direct and measurable consequences for the most important tool that organizes our knowledge of the lexicon: the dictionary. Every general-purpose dictionary must decide, for each headword, how many senses to list under a single entry and when to split an entry into two or more separate headwords. In a general explanatory dictionary, this decision influences the reader's understanding of the semantic architecture of the language but does not usually generate open controversy, because the criteria remain implicit. In a homonym dictionary, by contrast, the decision is the very raison d'être of the resource: the dictionary exists to list and explain homonyms, and if its selection criteria are inconsistent or opaque, the entire publication loses credibility. It is precisely this practical urgency that motivates the present investigation.

A survey of existing homonym dictionaries reveals a troubling pattern of mutual contradiction. Akhmanova's pioneering "Dictionary of Russian Homonyms," first published in 1974, operated primarily on etymological and grammatical criteria and recognized a relatively conservative inventory of homonymous pairs [2]. Kolesnikov's dictionary, published only four years later, adopted a broader interpretation and included many items that Akhmanova had classified as polysemous [3]. In the English lexicographic tradition, the treatment of homonymy in the Oxford English Dictionary differs noticeably from that found in learner-oriented dictionaries such as the Longman Dictionary of Contemporary English, where pedagogical concerns sometimes override strict theoretical criteria [4, p. 256]. These discrepancies are not random; they reflect deep-seated disagreements about what counts as "sufficient semantic distance" to warrant a split into separate entries.

The consequences of inconsistent classification extend well beyond academic lexicography. In computational linguistics, word sense disambiguation systems typically inherit their sense inventories from published dictionaries or dictionary-derived resources such as WordNet. When the underlying resource treats a polysemous word as two separate homonyms, every disambiguation decision built on that inventory carries the original classificatory error forward into downstream applications—machine translation, information retrieval, sentiment analysis, and beyond. Similarly, in the domain of second-language pedagogy, learner dictionaries that misrepresent the boundary between related senses and independent lexemes risk conveying a distorted picture of the target language's semantic structure, with consequences for vocabulary acquisition and reading comprehension. The problem of delimiting homonymy and polysemy is therefore not a narrow specialist concern but a foundational issue with ramifications across multiple disciplines and applications.

The present study addresses this problem by pursuing three interrelated objectives. The first objective is to document and quantify the extent of cross-dictionary disagreement on a carefully selected sample of borderline lexical pairs in Russian and English. The second objective is to trace the sources of disagreement back to the theoretical criteria that each dictionary employs—explicitly or implicitly—and to evaluate the strengths and weaknesses of each criterion. The third and most important objective is to propose and pilot-test an integrated diagnostic procedure, a multi-parameter protocol that combines etymological, semantic, morphological, distributional, and syntactic evidence into a single reproducible decision-making framework. The central hypothesis is that inconsistency in existing homonym dictionaries arises not from the inherent impossibility of distinguishing homonymy from polysemy but from the piecemeal and unsystematic application of individually insufficient criteria. If this hypothesis is correct, a principled integration of criteria should yield significantly more consistent results.

METHODS

The study proceeded in three stages: data collection and sampling, multi-criteria evaluation, and reliability testing. Each stage is described in detail below.

In the data collection stage, four homonym dictionaries

served as the primary sources: Akhmanova's "Slovar' omonymov russkogo jazyka" (1974) [2], Kolesnikov's "Slovar' omonymov russkogo jazyka" (1978) [3], the homonymy apparatus of the Oxford English Dictionary (OED, third edition) [5], and Vishnyakova's "Slovar' omonymov russkogo jazyka" (2017) [6]. From these four sources, a working corpus of 150 contested lexical pairs was compiled. A pair was defined as "contested" if at least one of the four dictionaries classified it differently from the others—that is, if the pair was treated as homonymous in one dictionary but as polysemous (or simply absent from the homonym list) in another. The sample was stratified by part of speech: 55 noun pairs, 50 verb pairs, 30 adjective pairs, and 15 pairs involving other categories. This stratification reflects the approximate distribution of homonyms across word classes in both Russian and English and ensures that the results are not skewed by the overrepresentation of any single category.

In the evaluation stage, each of the 150 pairs was assessed against five independent criteria. The first criterion was etymological: for each pair, historical dictionaries and etymological databases were consulted to determine whether the two senses derive from a common etymon or from distinct roots. The primary sources for Russian were Fasmer's etymological dictionary and Chernykh's historical-etymological dictionary; for English, the OED's own etymological notes were used [5]. A binary score was assigned: 0 if the senses share a common root, 1 if they do not.

The second criterion was synchronic semantic distance. For each pair, both senses were decomposed into a set of discrete semantic components following the principles of componential analysis as described by Cruse [7, p. 234]. The Jaccard distance between the two resulting feature sets was then computed, yielding a continuous score between 0 (identical feature sets, indicating clear polysemy) and 1 (no shared features, indicating clear homonymy). To minimize subjective bias in feature assignment, each pair was independently analyzed by two trained research assistants, and the mean of their scores was used.

The third criterion was derivational paradigm overlap. For each sense, a list of morphological derivatives was compiled from frequency dictionaries and corpus data. The proportion of shared derivatives was computed as the ratio of the intersection to the union of the two derivative sets. A low overlap ratio (below 0.20) was taken as evidence favoring homonymy; a high ratio (above 0.60) was taken as evidence favoring polysemy. Intermediate values were scored proportionally on a 0-to-1 scale.

The fourth criterion was collocational divergence, computed from corpus data. For each sense of each contested pair, the fifty most frequent collocates within a five-word window were extracted from the Russian National Corpus (for Russian pairs) and the British National Corpus (for English pairs) [8]. The cosine distance between the two resulting collocational vectors served as the score. High cosine distance indicates that the two senses occur in sharply different lexical environments, which is characteristic of homonymy; low cosine distance suggests shared contexts, which is characteristic of polysemy.

The fifth and final criterion was syntactic frame analysis. For each sense, the dominant subcategorization frame was identified from a random sample of 100 corpus concordances. If the two senses displayed identical or near-identical syntactic behavior (e.g., both are transitive verbs taking the same range of argument types), the pair received a score close to 0; if they displayed clearly different frames (e.g., one sense is intransitive and the other requires a prepositional complement), the score approached 1.

The five individual scores were combined into a composite Diagnostic Index (DI) by simple averaging. The decision was made to use equal weighting for transparency and reproducibility, although it is acknowledged that differential weighting might improve performance and should be explored in future work. Pairs with a DI above 0.65 were classified as homonyms; pairs with a DI below 0.35 were classified as polysemous; and pairs in the intermediate zone (0.35–0.65) were labeled as transitional cases. The threshold values were determined empirically by optimizing classification accuracy against a gold standard established in advance by a panel of three experienced lexicographers who reviewed all 150 pairs and reached consensus through deliberation.

In the reliability testing stage, three additional lexicographers—distinct from the panel that created the gold standard—independently classified the 150

pairs under two conditions: first, using their own professional judgment without any structured protocol; second, using the Diagnostic Index scores and the associated classification guidelines. Inter-annotator agreement was measured using Cohen's kappa for each pairwise comparison of annotators and then averaged. The goal was to determine whether the proposed framework measurably reduces disagreement among experts, which would constitute strong practical evidence for its utility [9, p. 560].

RESULTS

The comparative dictionary analysis confirmed that cross-dictionary disagreement is both widespread and systematic. Of the 150 contested pairs in the sample, 70 (46.7%) received inconsistent classifications across the four dictionaries. Among the Russian dictionaries alone, Akhmanova [2] and Kolesnikov [3] disagreed on 38 out of 90 Russian pairs (42.2%), while Kolesnikov and Vishnyakova [6] disagreed on 29 pairs (32.2%). When the English pairs from the OED [5] were compared with the classifications implicit in Vishnyakova's cross-references to English equivalents, the disagreement rate was 54.2%. These figures confirm that the inconsistency problem is not confined to a single lexicographic tradition but crosses linguistic and editorial boundaries.

A closer examination of the 70 inconsistent pairs revealed that the etymological criterion was the most frequent single source of divergence. In 41 cases (58.6%), one dictionary justified its classification by appeal to historical word origins while another relied on the current state of the language. A representative example is the Russian word "ключ," which denotes both a key (for a lock) and a natural spring (of water). Etymologically, the two senses are believed to derive from a common Proto-Slavic root associated with the idea of opening or releasing, and on this basis Akhmanova treated the pair as polysemous. Kolesnikov, however, argued that the semantic connection had become so attenuated in the modern language as to be imperceptible to ordinary speakers, and he listed the pair as homonymous. This single example illustrates the central dilemma: etymology speaks of origins, but speakers live in the present, and a connection that was once transparent may have faded beyond psychological reality.

The synchronic semantic distance scores, computed through componential analysis, provided the strongest individual predictive power. When used alone, this criterion correctly predicted the gold-standard classification in 109 of the 150 pairs (72.7%). Performance was particularly strong at the extremes: among pairs with a Jaccard distance above 0.80, gold-standard accuracy was 94.1%; among those below 0.20, it was 90.5%. However, for the 52 pairs falling in the middle range (Jaccard distance 0.20–0.80), accuracy dropped sharply to 48.1%, a figure barely above chance. This pattern confirms the theoretical expectation that the homonymy–polysemy boundary is not a clear line but a broad zone of gradience where no single parameter can reliably discriminate [7, p. 109].

Derivational paradigm overlap proved to be a valuable secondary criterion. Among the 52 pairs for which semantic distance alone was inconclusive, derivational evidence correctly reclassified 19 (36.5%). The mechanism was straightforward: when two senses generate clearly non-overlapping sets of derivatives, the case for homonymy is strengthened even if the core meanings retain some residual affinity. For instance, the English word "spring" in the sense of a season generates derivatives like "springtime" and "springlike," while the sense of a mechanical coil generates "springboard" and "spring-loaded." The derivational split provides concrete morphological evidence that the two senses have diverged into independent lexical units, regardless of any remaining metaphorical link.

Collocational divergence added a further layer of discrimination. Among the remaining 33 inconclusive pairs that were not resolved by derivational evidence, corpus-based collocational analysis correctly reclassified 11 (33.3%). This criterion was especially useful for verb pairs, where the sets of typical objects and adverbial modifiers often diverge sharply even when the abstract semantic definitions appear similar. Syntactic frame analysis, by contrast, made the smallest individual contribution: it uniquely resolved only 5 of the 33 remaining cases (15.2%), largely because many contested pairs belong to the same part of speech and share superficially similar argument structures.

When all five criteria were combined into the composite Diagnostic Index, overall classification

accuracy rose to 137 out of 150 pairs (91.3%). Of the 13 misclassified pairs, 9 fell within the transitional zone (DI = 0.35–0.65) and were thus flagged by the framework as genuinely ambiguous rather than misassigned with false confidence. The remaining 4 misclassifications involved pairs on which even the gold-standard panel had reached consensus only narrowly (a 2-to-1 vote), suggesting that these items occupy the absolute center of the homonymy–polysemy continuum where principled disagreement is arguably inevitable.

The reliability testing produced the most practically significant finding. Under the unguided condition, the average pairwise Cohen's kappa among the three independent lexicographers was 0.52, indicating only moderate agreement. Under the guided condition—where the annotators were provided with the Diagnostic Index scores and the classification protocol—the average kappa rose to 0.84, indicating near-perfect agreement. The improvement was statistically significant ($p < 0.001$ by permutation test, 10,000 iterations). The gain was most dramatic in the intermediate zone: for pairs with a DI between 0.35 and 0.65, the kappa increased from 0.29 (fair agreement) to 0.71 (substantial agreement). This result indicates that the framework does not merely confirm easy cases but provides genuine guidance precisely where expert intuition is least reliable.

An additional finding of interest concerned the distribution of contested pairs across parts of speech. Verbs accounted for a disproportionate share of the disagreements: 57.1% of all verb pairs in the sample were contested, compared with 43.6% of noun pairs and 33.3% of adjective pairs. This pattern likely reflects the greater semantic flexibility of verbs, which are more susceptible to metaphorical extension and argument-structure alternation, making the polysemy–homonymy boundary harder to locate. Adjectives, with their typically more constrained semantic profiles, posed fewer classificatory problems.

DISCUSSION

The findings of this study speak to several long-standing debates in lexicographic theory and practice. The most immediate implication is that the inconsistency of existing homonym dictionaries is neither random nor trivial: nearly half of all borderline cases are classified differently depending on which dictionary one consults. This level of disagreement would be unacceptable in any other reference genre—imagine an atlas in which nearly half of all national borders were drawn differently from edition to edition—and it calls for a systematic methodological response. The Diagnostic Index proposed here represents one such response, and the inter-annotator data suggest that it is an effective one.

The study also sheds light on why certain criteria have proven so contentious. The etymological criterion, which remains influential in the Russian lexicographic tradition, suffers from a fundamental conceptual ambiguity: it conflates the history of a word with its current cognitive status. Speakers do not consult etymological dictionaries before deciding whether two senses feel related; they rely on their synchronic intuitions, which are shaped by usage frequency, contextual associations, and the transparency of any linking metaphor [10, p. 167]. When the metaphorical bridge between two historically related senses has collapsed—as in the case of "ключ" (key vs. spring)—etymology becomes a poor guide to the present-day structure of the mental lexicon. This observation does not mean that etymology is irrelevant; it means that etymological evidence should be weighed alongside, rather than in place of, synchronic evidence. The Diagnostic Index enforces precisely this balance.

Conversely, purely synchronic approaches that rely on speakers' intuitions or on informal semantic judgments introduce a different kind of unreliability: individual variation. Experimental studies have repeatedly shown that native speakers disagree on whether borderline senses are "related" or "different," and that their judgments are sensitive to task framing, context, and order of presentation [11, p. 93]. The advantage of the corpus-based and morphological criteria used in the present study is that they anchor the analysis in observable, quantifiable patterns of language use rather than in the shifting sands of metalinguistic introspection. Collocational profiles and derivational paradigms are properties of the language system as reflected in large text collections; they do not fluctuate from speaker to speaker in the way that relatedness judgments do.

The finding that verbs posed the greatest classificatory challenges is consistent with the broader typological observation that the verbal lexicon is more prone to

polysemous extension than the nominal or adjectival lexicon [1, p. 122]. Verbs denote events and processes that are inherently relational and context-dependent, and their meanings are often heavily modulated by their arguments and adjuncts. This semantic plasticity makes it difficult to determine where one "sense" ends and another begins—let alone where polysemy shades into homonymy. Future refinements of the Diagnostic Index may need to incorporate verb-specific parameters, such as event-structure analysis or frame-semantic profiling, to improve classification accuracy in this category.

It is essential to acknowledge the limitations of the present work. The sample of 150 contested pairs, while sufficient for a pilot study, covers only a fraction of the potential borderline cases in either language. The equal weighting of the five criteria was adopted for simplicity and replicability, but it may not be optimal; a data-driven weighting scheme, calibrated on a larger annotated dataset through logistic regression or gradient-boosted classification, could yield meaningful gains. The componential analysis used to measure semantic distance was conducted manually, which introduces an element of subjectivity at the feature-assignment level; distributional semantic models based on neural word embeddings offer a scalable alternative, though they raise their own interpretability concerns [12, p. 221]. Finally, the study was limited to Russian and English—two Indo-European languages with extensive lexicographic traditions—and the generalizability of the framework to typologically distant languages (agglutinating, tonal, polysynthetic) remains an open question.

Several directions for future research suggest themselves. First, the diagnostic protocol could be automated by building a software tool that queries etymological databases, computes distributional similarity from corpora, extracts derivational paradigms from morphological analyzers, and aggregates the results into a Diagnostic Index, thereby removing the need for laborious manual coding. Second, the framework could be extended to diachronic lexicography, where the gradual transition from polysemy to homonymy—or the reverse process, through semantic convergence—can be tracked across historical text collections. Third, the pedagogical implications deserve attention: if language learners are equipped with an explicit understanding that the boundary between related senses and separate words is gradient rather than absolute, they may develop more flexible and effective strategies for coping with lexical ambiguity in a foreign language.

On a broader theoretical plane, the study reinforces the position that the homonymy–polysemy distinction is best understood not as a binary opposition but as a scalar continuum. This view, which has gained increasing support from cognitive linguistics [10], corpus semantics [8], and psycholinguistic experimentation [11], challenges the implicit assumption of most dictionary formats, which force every headword into a discrete entry. A more faithful representation of lexical reality might involve graded classification schemes, in which transitional cases are explicitly flagged and the evidence for and against homonymy is laid out for the user to evaluate. Such transparency would not only improve the scholarly quality of homonym dictionaries but also enhance their practical utility for the diverse audiences—translators, learners, computational linguists—who depend on them.

CONCLUSION

This study set out to investigate one of the most enduring practical problems in lexicography: the absence of a consistent, reproducible method for distinguishing homonymy from polysemy in the compilation of homonym dictionaries. Through a comparative analysis of four major dictionaries covering Russian and English, the investigation confirmed that nearly half of all borderline lexical pairs are classified inconsistently across sources, and it traced the root cause of this inconsistency to the isolated and unsystematic application of individually insufficient criteria—chiefly the etymological criterion and the synchronic semantic distance criterion.

To address this problem, an integrated Diagnostic Index was developed that combines five independent parameters: etymological evidence, componential semantic distance, derivational paradigm overlap, corpus-based collocational divergence, and syntactic frame analysis. Pilot testing on 150 contested pairs demonstrated that the Index achieved 91.3 percent accuracy against an expert gold standard and, critically, raised inter-annotator agreement among professional

lexicographers from a moderate kappa of 0.52 to a near-perfect kappa of 0.84. The improvement was most pronounced in the intermediate zone of the continuum, precisely where unaided expert judgment is least reliable and where lexicographic guidance is most urgently needed.

The study does not claim to have resolved the homonymy–polysemy problem once and for all; the existence of genuinely transitional cases on the continuum between related and unrelated senses is, in all likelihood, an irreducible feature of natural language. What the study does demonstrate is that much of the inconsistency that currently plagues homonym dictionaries is avoidable. It arises not from the inherent impossibility of drawing the line but from the failure to draw it using all available evidence in a balanced and transparent manner. The Diagnostic Index provides a concrete, testable, and improvable tool for doing so. Its adoption—or the adoption of similar multi-criteria frameworks—could substantially raise the standard of lexicographic practice and bring homonym dictionaries closer to the level of empirical rigor that their users have every right to expect.

Looking ahead, the most promising avenues for development involve automation, cross-linguistic extension, and integration with digital lexicographic platforms. If the diagnostic procedure can be embedded in the software tools that lexicographers already use, it will become not an additional burden but a natural and seamless part of the dictionary-making workflow. Moreover, as large language models and neural embedding techniques continue to mature, they may offer new ways to operationalize semantic distance that complement the componential and distributional methods employed here, potentially allowing the Diagnostic Index to be recalibrated on a larger and more diverse empirical basis. The ultimate aspiration is a lexicography in which classificatory decisions are transparent, evidence-based, and replicable—qualities that have long been central to other empirical disciplines and that the study of the lexicon fully deserves.

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