CENTRE FOR LANGUAGE TECHNOLOGY
MACQUARIE UNIVERSITY ~ SYDNEY

Automated Writing Assistance: Grammar Checking and Beyond
Topic 3: Grammar Checking

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The Need

Products » WhiteSmoke Writer 2011 » Grammar Checker

Grammar Checker

You might have asked yourself before sending an important email to a business colleague or a new friend:

"Will this text read better if I perform a grammar check?"

You are not alone! People all around the world find themselves asking this question when trying to avoid grammar mistakes in their texts.

Grammar Checker – The Ultimate Solution for Your Grammar Errors

Proofread your text in a single click by using an online grammar checker.
An online grammar checker will save you the embarrassment of sending a text with grammar mistakes and will make your text look more professional and reliable.

Outline

- What is a Grammatical Error?
- Grammar Checking without Syntax
- IBM's EPISTLE
- Grammar Checking Techniques
- Related Areas
- Commercial Packages

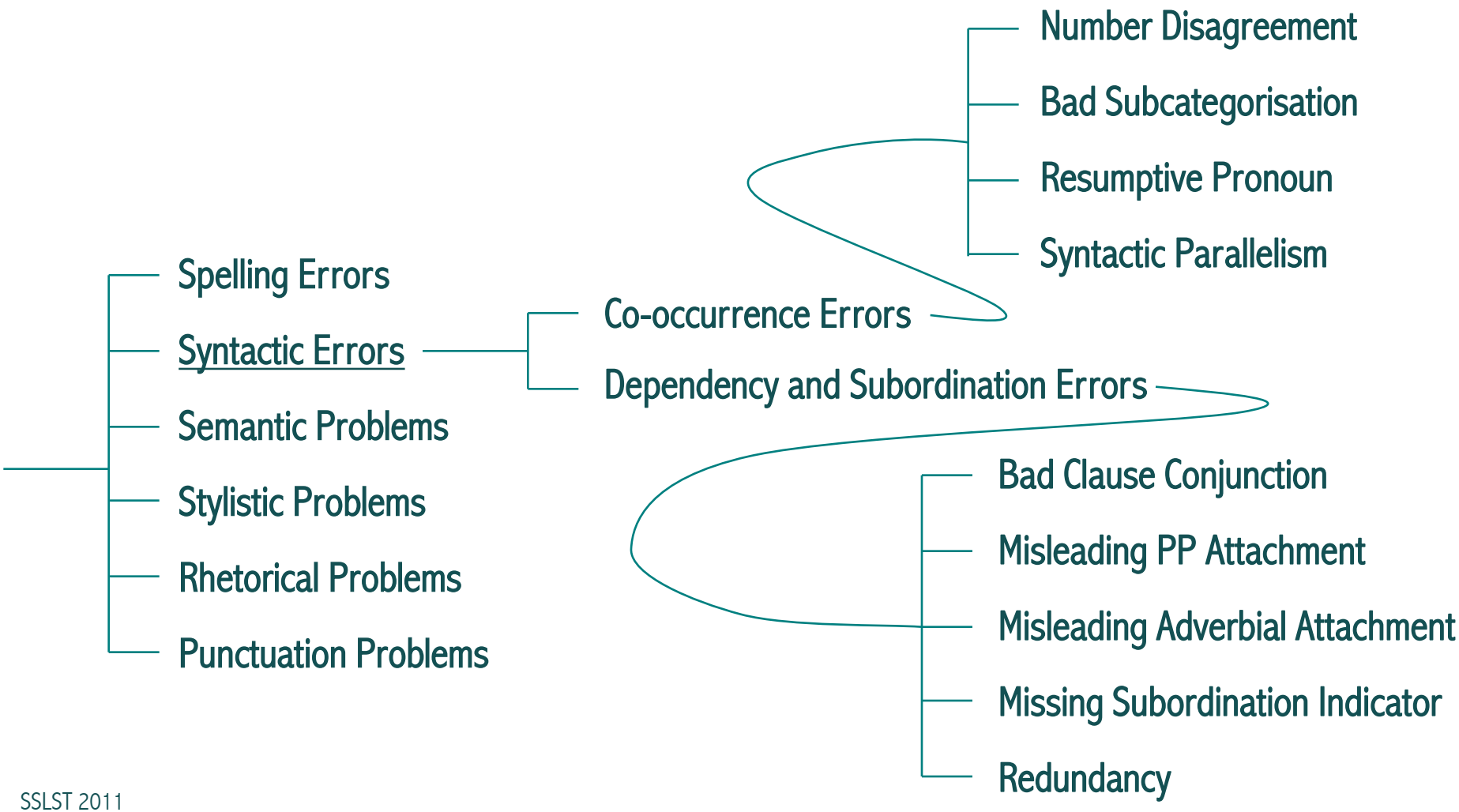
What is a Grammatical Error?

- Something that breaks the rules of the language
- Who decides?
  - Dialects
  - Formality
  - Language change
- Some jurisdictions are stricter than others
  - L'Académie française and its 40 ‘immortals’

Agreement Errors: The Paradigm Grammatical Error

- John and Mary is coming today.
- A blocks are red.

Taxonomies of Error: Douglas and Dale 1991



Subject–Verb Number Disagreement

- But the males in this study experienced significant difficulties in this area and this problem suggest that some more attention be paid to the phenomenon.
- This method requires a user to think aloud while performing a task, while the researchers makes notes, and perhaps records the session on audio or video tape.
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→The main reported problems were with the Unix editor vi.

Incorrect Subcategorisation Frames: Verbs

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Incorrect Subcategorisation Frames: Nouns and Prepositions

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→In this way, it is anticipated that the issue of native users not really knowing what it is they need to know will be dealt with.

Incorrect Subcategorisation Frames: Nouns and Prepositions

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- All mailing systems have capabilities of composing, sending and receiving messages.

→All mailing systems have facilities for composing, sending and receiving messages.

Incorrect Subcategorisation Frames: Adjectival Complements

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- The feature checklist was easy to administer and complete by experienced users …

→The feature checklist was easy to administer and easy for experienced users to complete …

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Bad Clause Conjunction

- It had approximately 13% of the pages of the commercial manual, it allowed 30% faster learning and more effective use of the email system overall, and significantly better performance on individual subtasks including recovery from error.

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→However, if the manual is to be properly user-centred, novice users should be able to voice thoughts and desires on any topic throughout the process.

Syntactic Redundancy

- So although this seems to be is a winning feature in learning, it may not …
- … this problem suggests that some more attention be paid to the phenomenon
- … thus so this argues for the complementary use of …

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What Causes Grammar Errors?

- Competence-based errors:
  - Unfamiliarity with the language
- Performance-based errors:
  - Repeated words
  - Editing errors

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The Unix Writer's Workbench

- A breakthrough in the early 1980s
  - We believe that the Writer's Workbench programs provide a more general text analysis system than JOURNALISM or CRES, and unlike EPISTLE they are already in wide use. At Bell Laboratories there are over 1000 users on over 50 machines. [1982:106]
- Widely-used in educational contexts
- Underlying technology formed the basis for the first PC grammar checkers: Grammatik, RightWriter, StyleWriter

The Unix Writer's Workbench: Proofreading with PROOFR

- Checks for existence of non-word spelling errors; user-specified automatic correction can be carried out
- Checks for unbalanced punctuation and other simple punctuation mistakes
- Checks for double words
- Checks for misused words, wordy phrases, sexist terms, …
- Checks for split infinitives using a simple PoS tagger

The Unix Writer's Workbench: Stylistic Analysis with STYLE

- Based on PoS tagging, provides 71 numbers describing stylistic features of the text
  - Readability indices
  - Average sentence and word length
  - Distribution of sentence lengths
  - Percentage of verbs in passive voice
  - Percentage of nouns that are nominalisations
  - …

The Unix Writer's Workbench: Stylistic Analysis with STYLE

```
readability grades:
        (Kincaid) 11.3  (auto) 12.6  (Coleman-Liau) 13.1  (Flesch) 13.2 (48.8)
sentence info:
        no. sent 240 no. wds 4636
        av sent leng 19.3 av word leng 5.18
        no. questions 1 no. imperatives 0
        no. content wds 2734  59.0%  av leng 6.72
        short sent (<14) 24% (58) long sent (>29)  9% (22)
        longest sent 64 wds at sent 150; shortest sent 4 wds at sent 70
sentence types:
        simple  42% (101) complex  38% (92)
        compound  7% (16) compound-complex  13% (31)
word usage:
        verb types as % of total verbs
        tobe  32% (170) aux  16% (85) inf  17% (89)
        passives as % of non-inf verbs  14% (63)
        types as % of total
        prep 10.5% (487) conj 3.8% (177) adv 4.2% (197)
        noun 28.0% (1296) adj 17.2% (797) pron 4.7% (220)
        nominalizations  2 % (90)
sentence beginnings:
        subject opener: noun (48) pron (28) pos (1) adj (35) art (57) tot  70%
        prep  13% (32) adv  6% (15)
        verb  1% (3)  sub_conj  6% (14) conj  2% (5)
        expletives  1% (2)
```

The Unix Writer's Workbench: Other Components

- PROSE: compares the stylistic parameters of a given text against a domain-specific standard
- ABST: determines the conceptual abstractness of a text via a list of 314 abstract words
- ORG: prints only first and last sentences of paragraphs

Atwell [1987]: CLAWS

- Originally built to assign PoS tags to the London-Oslo-Bergen corpus
- Developed in part because of the computational cost of more complex systems:
  - '[Heidorn et al 82] reported that the EPISTLE system required a 4Mb virtual machine (although a more efficient implementation under development should require less memory).' [1987:38]

Atwell [1987]: Constituent-Likelihood Error Detection

- For PoS tagging, uses a table of PoS bigram frequencies to determine most likely sequences
- Detects grammatical errors by flagging unlikely PoS transitions
- Doesn't need separate data for training error likelihoods

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IBM's EPISTLE: History

- Initial work in the early 1980s led to several innovative techniques
- Based on Heidorn's Augmented Phrase Structure Grammar [1975]
- Renamed CRITIQUE somewhere in the mid to late1980s
- Released on IBM mainframes late 1980s
- Key team members went on to build Microsoft Word's grammar checker from 1992 onwards
- Grammar checking released as part of MS Word 97

IBM's CRITIQUE: Grammar vs Style

- Grammatical critiques:
  - Strict rules as to whether a sentence is grammatical or not
  - Correction is typically clear
- Stylistic weaknesses are less black and white:
  - too great a distance between subject and verb
  - too much embedding
  - unbalanced subject/predicate size
  - excessive negation or quantification
  - …

IBM's CRITIQUE : Grammar Errors

- Number Disagreement:
  - he go, many book, it clarifies and enforce
- Wrong Pronoun Case:
  - between you and I, it is me
- Wrong Verb Form:
  - had expect, seems to been
- Punctuation:
  - run-on sentences, questions with a final period instead of a question mark
- Confusions:
  - who's vs whose, it's vs its, your vs you're, form vs from

IBM's CRITIQUE : Stylistic Weaknesses #1

- Excessive length
  - Sentences or lists that are too long
  - Sequences with too many prepositional phrases
- Excessive complexity
  - Noun phrases with too many premodifiers
  - Clauses with a series of *and*s
  - Verb phrases with too many auxiliary verbs
  - Clauses with too much negation
- Lack of parallelism
  - Example: you should drink coffee rather than drinking tea

IBM's CRITIQUE : Stylistic Weaknesses #2

- Excessive formality
  - phrases that are bureaucratic, pompous or too formal
- Excessive informality
  - constructions acceptable in spoken English but too informal when written
- Redundancy
  - phrases that can be shortened without loss in meaning
- Missing punctuation
- Nonpreferred constructions
  - Split infinitives [eg to completely remove], colloquial usage [eg ain't working]

The MS Word Grammar Checker: Processing Steps

1. Tokenisation and Lexical Lookup
2. Syntactic Sketch
3. Syntactic Portrait
4. Production of Logical Forms

The MS Word Grammar Checker: An Example

- Consider the following sentence:
  - After running a mile he seemed tired.

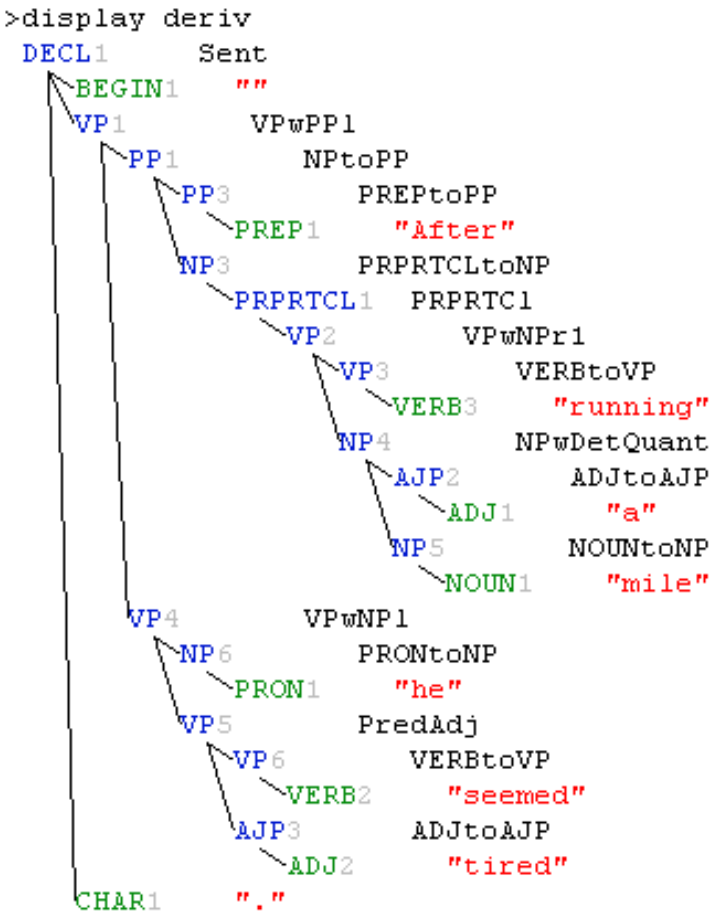
The MS Word Grammar Checker: Lexical PoS Records

- Also includes detection of multiword elements and named entity mentions
- Lexicon based on LDOCE and AHD + supplementary information added both manually and automatically
- Over 100k words
- There are two other records produced for 'after' here for the Adj and Adv uses

```
  ------------------------------
{Segtype     PREP
 Nodetype    PREP
 Nodename    PREP1
 Ft-Lt       1-1
 String      "After"
 CopyOf      REC40
 Lex         "After"
 Lemma       "after"
 Bits        TakesAn InitCap Tme
 Prob        1.00000 }
  ------------------------------
{Segtype     CONJ
 Nodetype    CONJ
 Nodename    CONJ1
 Ft-Lt       1-1
 String      "After"
 CopyOf      REC41
 Lex         "After"
 Lemma       "after"
 Bits        Subconj TakesAn
             InitCap Tme
 Prob        0.00119 }
  ------------------------------
```

The MS Word Grammar Checker: Syntactic Analysis

- Bottom-up chart parser
- Uses probabilities and heuristics
- Grammar contains 125 mostly binary rules
- This is the derivation tree



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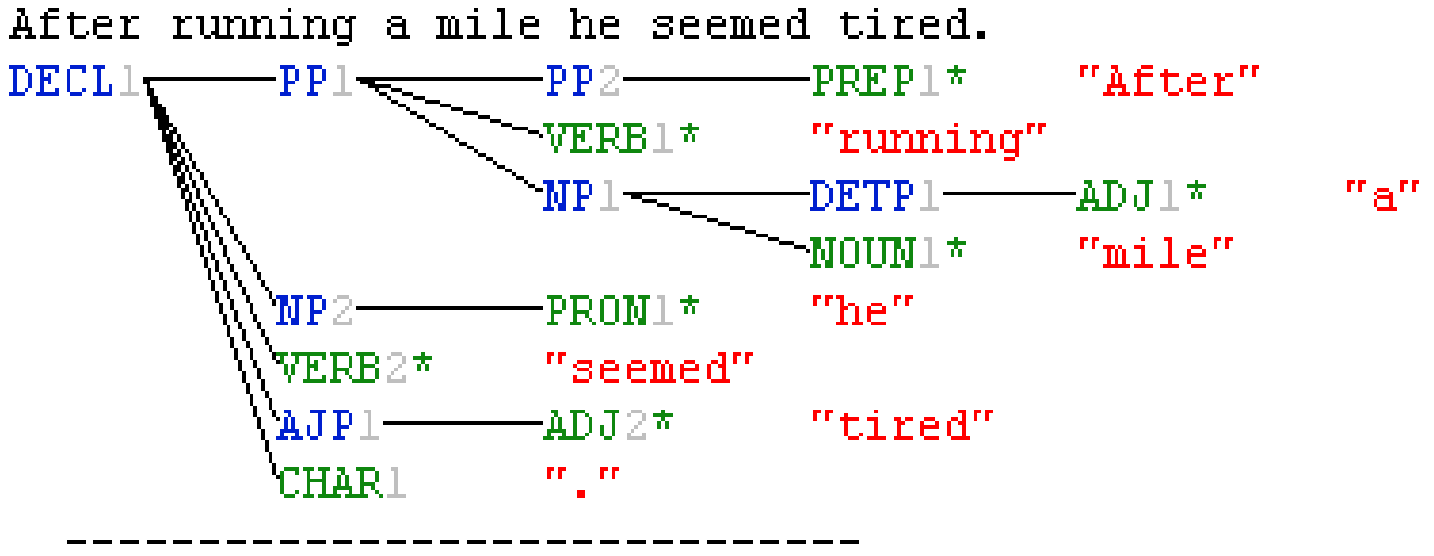


The MS Word Grammar Checker: Syntactic Information Stored at the Root Node

```
>display record DECL1
(Segtype     SENT
 Nodetype    DECL
 Nodename    DECL1
 Ft-Lt       0-8
 String      " After running a mile he seemed tired ."
 CopyOf      VP1
 Rules       (Sent VPwPP1 VPwNP1 PredAdj VERBtoVP)
 Constits    (BEGIN1 VP1 CHAR1)
 Lex         "seemed"
 Lemma       "seem"
 Bits        Pers3 Sing Past Closed
             L9 B0 Wv6 L1 L7 I3
             RtoSub F0 Wv8 Wv7 Wv4
             Wv6N I5 I6
 Prob        0.25645
 Prmods      PP1 "After running a mile"
             NP2 "he"
 Head        VERB2 "seemed"
 Psmods      AJP1 "tired"
             CHAR1 "."
 Subject     NP2 "he"
 Predadj     AJP1 "tired"
 Props       DECL1 " After running a mile he seemed tired ."
             PRPRTCL1 "running a mile"
 Pod         40
 Inverts     PP1 "After running a mile"
 Nargs       1
 FrstV       VERB2 "seemed"
 Vprp        (like)
 Predicat    VP5 "seemed tired"
 Topic       NP2 "he"
 TopPPs      PP1 "After running a mile"
 Score       40.000000000 )
```

The MS Word Grammar Checker: The VP→ VP PP Rule [Abbreviated]

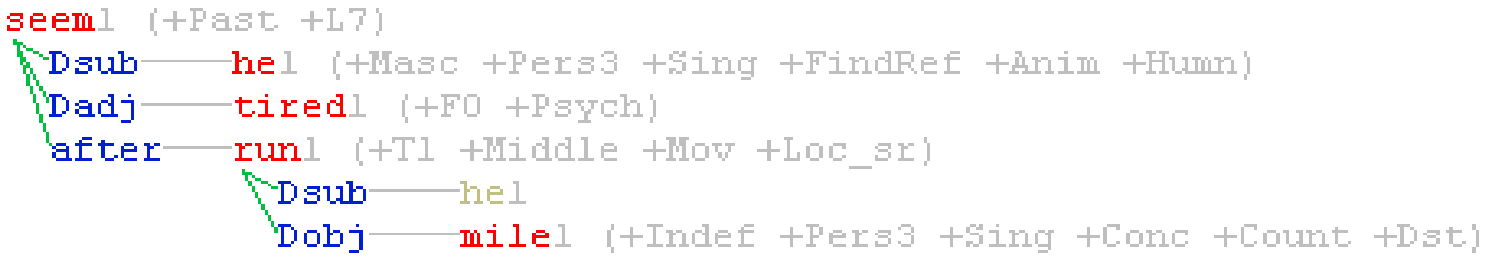
```
VPwPPl:

    PP ( ^Comma(Prp) & ^Nappcomma(lastrec) & ^Precomma(lastrec) & ^SuspSUBCL & (forany(Prmods, [Comma]) -> Coords) &
         forall(firstrecs(PPobj), [Digits^=3 & Digits^=4]) & (forany(lastrecs, [Comma & ^Paren]) -> (Multcomma | Comma(lastphr))) &
         forall(lastrecs, [^Nomcomp | ^T5 | (Compl & Lemma(lasttokn)^="that")]) & (Gerund -> (^Rel(Postadv) | Postadv^=lastrec)) &
         Lemma(Prp) ^in? set{a an but x X} & forall(Coords, [Lemma(Prp) ^in? set{a an but x X}]) )

    VP ( ^Semiaux & ^Relpn & ^Paren &
         (forany(lastrecs(PP), [Nappcomma]) -> (^Pastpart | ^PPobj(first(Psmods)) |
            ^Comma(first(Psmods)))) &
         forall(lastrecs(PP), [Nappcomma -> (^Multcomma | Numbr ^agree? Numbr(VP))]) &
         (Nodetype(lastrec(PP))=="RELCL" -> (^Thatcomp(lasttokn(PP)) |
            Rel(first(Prmods(lastrec(PP)))))) & Nodetype(last(Psmods)) ^in? set{SREL TAG} &
         (Ord(Adj(Lex(lasttokn(PP)))) -> ^Num(Adj(Lex(firsttokn(first(Prmods)))))) &
         (Adv(Lex) -> (Prmods | Obj1 | (^Confus & Lemma ^in? set{no yes}))) & (Wh(Conj(Lex(PP))) -> (Prmods(PPobj(PP)) | YNQ)) &
         (Digits(first(Prmods)) -> (^Comma(first(Prmods)) | Prmods(first(Prmods)) | Nodetype(lasttokn(PP))^="NOUN")) &
         (Mnth(lasttokn(PP)) -> (^Ord(firsttokn) | ^Digits(firsttokn) | Digits(firsttokn)>2)) &
         ((Nom(Pron(Lex(lastrec(PP)))) & ^Obj(Pron(Lex(lastrec(PP))))) ->
            (Subject & Subject in? Prmods)) &  (T5 -> (^Comma | (forall(Psmods, [^Oldsubcl]) &
            (^Nomcomp(Predcomp) | Compl(Predcomp) | ^Comma(lastphr(PP)))))) )

 --> VP { Prmods=PP++Prmods; Props=Props(PP)++Props; -SuspNREL;
          if (Subject(VP) ^in? Prmods(VP) & FortoPP(PP)) {Subject=PP; -VPInvert;}
          else if ((^Subject(VP) | VPInvert(VP)) & ^theresubj_test(VP)) MidPPs=PP++MidPPs;
          else {TopPPs=PP++TopPPs; Inverts=PP++Inverts;}; Pod=Pod+Pod(PP);
          if (Lemma(lasttokn(PP))==";") Pod=Pod-4;
          if (^PPobj(PP) & Loc(Adv(Lex(PP)))) Pod=Pod-1;
          if (Subject in? Prmods(VP) | theresubj_test) Pod=Pod+1; }
```

The MS Word Grammar Checker: A Logical Form



The MS Word Grammar Checker: An Error Checking Rule

```
Desc_Comma5:

  SYNREC (((Nodetype in? set{SUBCL AVP PRPRTCL AVPNP INFCL}) |
                (Nodetype=="PP" & PPobj)) &
             seg==first(Prmods(Parent)) &
             Nodetype(lasttokn) ^= "CHAR" &
             ^Theresubj &
             seg ^= Subject(Parent) &
             (Nodetype=="AVP" -> (^TheAVP & ^forany(Prmods,[TheAVP]))) &
             (Wh -> Lemma=="however") &
             ^forany(Coords,[Wh]) &
             (Nodetype(Head(Parent))=="VERB" | VPcoord(Parent)) &
             (Neg -> ^YNQ(Parent)) &
             ((Subject(Parent) &
                ((Ft(Subject(Parent))<Ft(FrstV(Parent)) & Ft(Subject(Parent))>Ft) |
                 (VPcoord(Parent) & Ft(Subject)<Ft(FrstV(first(Coords(Parent))))))) |
               Nodetype(Parent)=="IMPR" |
               (Nodetype(Parent)=="QUES" & (YNQ(Parent) | WhQ(Parent)))))

 --> SYNREC { { segrec rec, commarec;
                commarec=segrec{Nodetype="CHAR"; Lemma=",";};
                rec=segrec{%%SYNREC; Psmods=Psmods++commarec;};
                add_descrip("Comma with Adverbials",0,rec); }; }
```

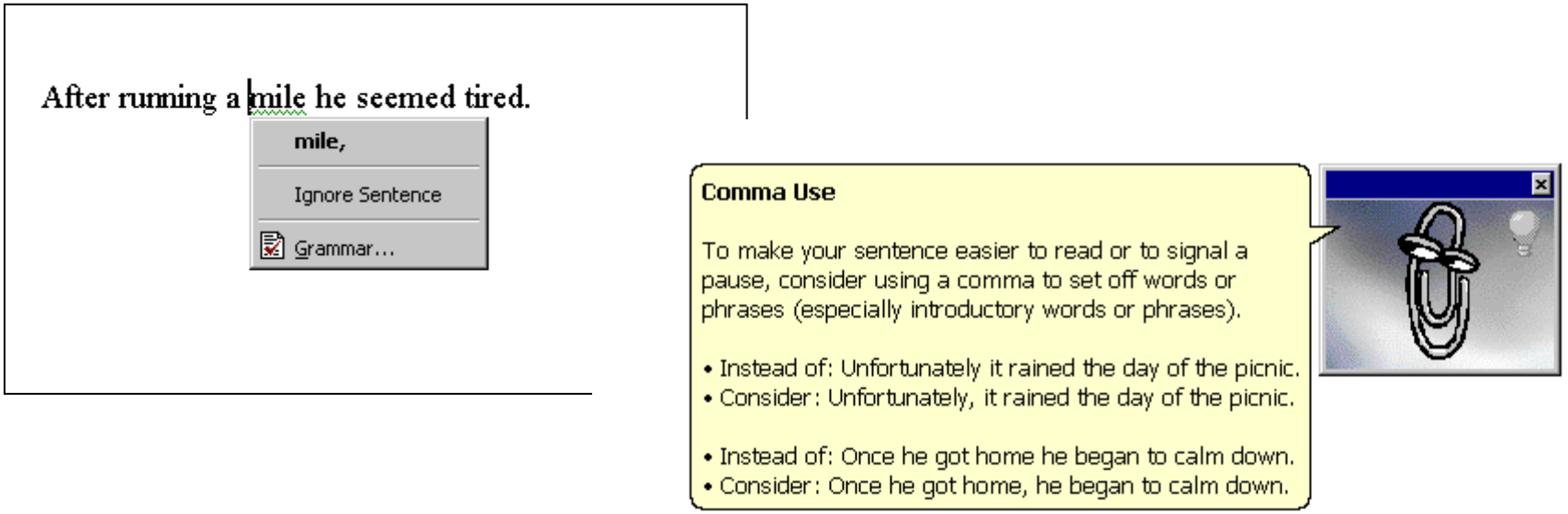
The MS Word Grammar Checker: A Segment Record with An Error

```
>display record PP1
(Segtype    PP
 Nodetype   PP
 Nodename   PP1
 Ft-Lt      1-4
 String     "After running a mile"
 CopyOf     NP3
 Rules      (TrLF_ControlatVP Desc_Comma5 NPtoPP PRPRTCLtoNP PRPRTC1 VPwNPr1 VERBtoVP)
 Constits   (PP1 PP1 PP3 NP3)
 Lex        "running"
 Lemma      "run"
 Bits       Pers3 Sing L9 X9 Wv6
            IO D1 T1 L1 L7 T5
            Asubj Loc_sr Unacc Mov
            Middle Wv4
 Prob       0.05383
 Prmods     PP2 "After"
 Head       VERB1 "running"
 Psmods     NP1 "a mile"
 Gerund     VERB1 "running"
 PPobj      NP3 "running a mile"
 Prp        PP2 "After"
 Obj1       NP1 "a mile"
 Props      PRPRTCL1 "running a mile"
 Pod        16
 Parent     DECL1 "After running a mile he seemed tired ."
 Nargs      1
 FrstV      VERB3 "running"
 Object     NP1 "a mile"
 Vptc       (along around away back down in off on out over through up across after)
 Vprp       (across after at from with over into on of through to against)
 Descrips
       (Ft-Lt      1-4
        Value      18
        DescType   "Comma with Adverbials"
        DescRep1   PP4 "After running a mile"
        DescRep1Str "After running a mile," )
 SemNode    run1
 PrevCat    PP )
```

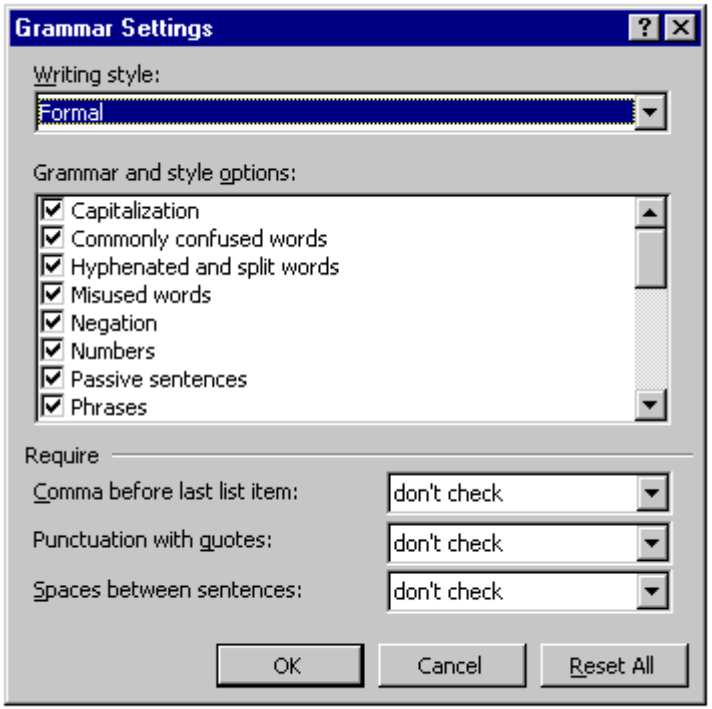
The MS Word Grammar Checker: The Results of Error Checking

```
>display desc

Comma with Adverbials:
        After running a mile     consider:  After running a mile,
```



The MS Word Grammar Checker: Controlling the Checker's Behaviour



EPISTLE/CRITIQUE/MS Word: Key Ideas

- A metric for ranking alternative parses [Heidorn 1982]
- Relaxation for parsing errorred sentences [Heidorn et al 1982]
- A heuristic fitted parsing technique for sentences outside the grammar's coverage [Jensen et al 1983]

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Constraint Relaxation: The Basic Idea

- When a sentence cannot be parsed, relax the grammar rules in some way so that it can be parsed
- The particular constraints that are relaxed indicate what the nature of the grammatical error is
- First explored in the context of robust parsing by Weischedel and Black [1980]

Constraint Relaxation: Handling Constraint Violation Errors

- Subject-verb number agreement
  - * John and Mary runs
- Premodifier-noun number agreement
  - * This dogs runs
- Subject-complement number agreement
  - * There is five dogs here
- Wrong pronoun case
  - * He and me ran to the door
- Wrong indefinite article
  - * A apple and a rotten old pear.

Constraint Relaxation: Handling Constraint Violation Errors

- **A constraint in an EPISTLE rule:**

$$\begin{aligned}&\text{NP VP (NUMB.AGREE.NUMB(NP))} \rightarrow \\ &\quad \text{VP(SUBJECT} = \text{NP)}\end{aligned}$$

- **The same constraint in PATR-II:**

$$\begin{array}{lll}\text{X0} \rightarrow \text{X1 X2} & & \\ \quad \langle \text{X0 cat} \rangle & = & \text{VP} \\ \quad \langle \text{X1 cat} \rangle & = & \text{NP} \\ \quad \langle \text{X2 cat} \rangle & = & \text{VP} \\ \quad \langle \text{X0 subject} \rangle & = & \text{X1} \\ \quad \langle \text{X1 num} \rangle & = & \langle \text{X2 num} \rangle\end{array}$$

Constraint Relaxation [Douglas and Dale 1992]: Relaxation Packages

X0 → X1 X2

1	⟨X0 cat⟩	=	NP
2	⟨X1 cat⟩	=	Det
3	⟨X2 cat⟩	=	N
4	⟨X1 agr precedes⟩	=	⟨X2 agr begins⟩
5	⟨X1 agr num⟩	=	⟨X2 agr num⟩
6	⟨X0 agr num⟩	=	⟨X2 agr num⟩

Relaxation level 0:
necessary constraints = {1,2,3,4,5,6}
optional constraints = {}

Relaxation level 1:
necessary constraints: {1,2,3}
relaxation packages:

(a) {5, 6}: Premodifier-noun number disagreement
(b) {4}: *a/an* error

Constraint Relaxation

- Advantages:
  - provides a precise and systematic way of specifying the relationship between errorful and 'correct' forms, making it easier to generate suggestions for corrections
- Disadvantages:
  - Requires significant amounts of hand-crafted linguistic knowledge

Mal-Rules

- Also known as error anticipation
- Mal-rules explicitly describe specific expected error forms

A Mal-Rule for Handling Omissions [Schneider and McCoy 1998]

- Example:

  The boy happy
- Conventional rule:

  VP $\rightarrow$ V AdjP
- Malrule:

  VP[error +] $\rightarrow$ AdjP

Mal-Rules

- Advantage:
  - Specifically targets known problems
  - Allows easy identification of the nature of the error
- Disadvantages:
  - Requires error types to be catalogued in advance
  - Infeasible to anticipate every possible error
- Arguably mal-rules are just a notational variant of constraint relaxation approaches

Other Approaches

- Fitted parsing [Jensen et al 1983]
- Mixed bottom-up and top-down parsing [Mellish 1989]
- Minimum edit distance parsing [Lee et al 1995]

Outline

- What is a Grammatical Error?
- Grammar Checking without Syntax
- IBM's EPISTLE
- Grammar Checking Techniques
- Related Areas
- Commercial Packages

Robust Parsing

- The Goal:
  - Analyse extragrammatical input in order to extract some useful meaning
- No need to characterise and repair the error
- Processing of spoken language is a special case

Controlled Languages

- The Goal:
  - Ensure that a text conforms to a specific set of rules and conventions
- Examples:
  - ASD Simplified Technical English
  - Caterpillar Technical English
  - EasyEnglish
  - Attempto Controlled English
- See http://www.geocities.ws/controlledlanguage/

Outline

- What is a Grammatical Error?
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Do Current Grammar Checkers Help?

- In real use, grammar checkers may have low recall and low precision

Kohut and Gorman [1995]: An Empirical Evaluation of Five Packages

Package	Total # Errors	Real Errors Correctly Identified	Real Errors Incorrectly Identified	False Errors	False Errors/Total Deteted
PowerEdit	133	47%	12%	11%	16.13%
RightWriter	133	34%	8%	7%	13.85%
Grammatik	133	31%	6%	11%	23.44%
Editor	133	17%	3%	4%	16.13%
CorrectGrammar	133	15%	5%	10%	32.5%

Kohut and Gorman [1995]: An Empirical Evaluation of Five Packages

Mechanical Errors

	Errors Found by Authors	*PowerEdit*		*RightWriter*		*Grammatik*		*Editor*		*Percentage Correct Grammar*	
Punctuation	29	13	(45%)	9	(31%)	5	(17%)	5	(17%)	3	(10%)
Agreement	8	2	(25%)	2	(25%)	3	(38%)	1	(13%)	2	(25%)
Capitalization	2	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)
Verb form	3	1	(33%)	1	(33%)	3	(100%)	0	(0%)	0	(0%)
Sentence structure	20	15	(75%)	10	(50%)	9	(45%)	2	(10%)	3	(15%)
Total mechanical errors	62	31	(50%)	22	(35%)	20	(32%)	8	(13%)	8	(13%)

Style Errors

	Errors Found by Author	*PowerEdit*		*RightWriter*		*Grammatik*		*Editor*		*Correct Grammar*	
Passive voice	15	9	(60%)	7	(47%)	4	(27%)	0	(0%)	7	(47%)
Complex sentences	3	3	(100%)	3	(100%)	2	(67%)	0	(0%)	1	(33%)
Wrong word	21	3	(14%)	4	(19%)	7	(33%)	4	(19%)	3	(14%)
Redundancy	5	1	(20%)	0	(0%)	0	(0%)	1	(20%)	0	(0%)
Weak wording	18	13	(72%)	7	(39%)	5	(28%)	6	(33%)	1	(6%)
Slang/colloquialisms	2	1	(50%)	1	(50%)	0	(0%)	1	(50%)	0	(0%)
Sexist language	6	0	(0%)	1	(17%)	1	(17%)	2	(33%)	0	(0%)
Negative wording	1	1	(100%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)
Total style errors	71	31	(44%)	23	(32%)	19	(27%)	14	(20%)	12	(17%)

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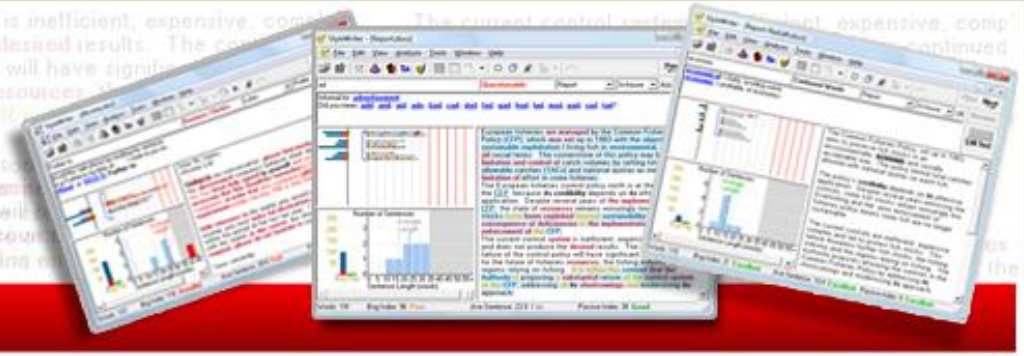

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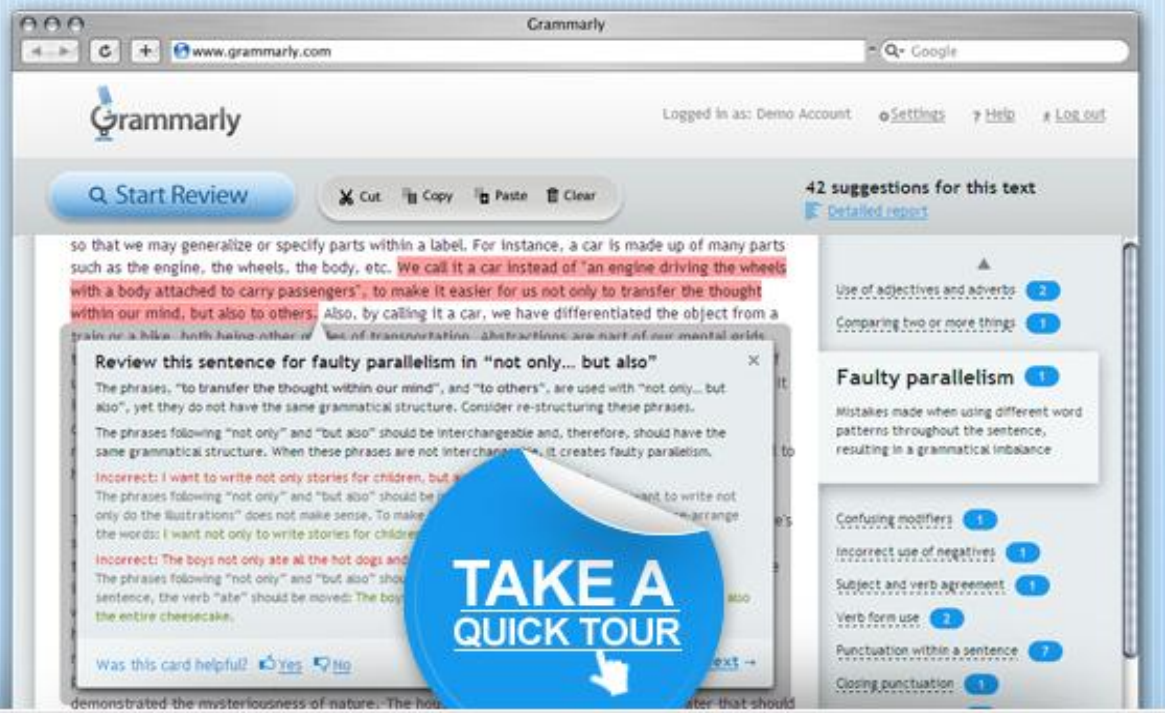

Features and Benefits

150+ Grammar Checks

Check your text for the proper use of advanced grammar rules. Get accurate error explanations and

Grammarly vs. Other Products

	Grammarly	Other Products
Powerful Toolset:		

English Grammar Checker Software | WhiteSmoke | World-Leading Language Solutions by WhiteSmoke - Mozilla Firefox

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Style Checker	Improve your writing style, vocabulary, and sentence structure.
Writing Review	Learn from your mistakes and advance your skills at one go.
Text Enrichment Engine	Get relevant adjectives and adverbs when you need them

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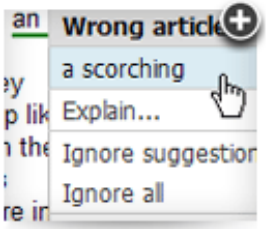
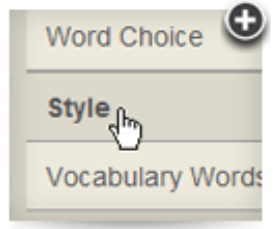


Robust grammar checking allows you to find those pesky mistakes and correct them before turning in your paper.

Plagiarism Detection

Find out if your paper contains plagiarized text before your professor does.

Writing Suggestions



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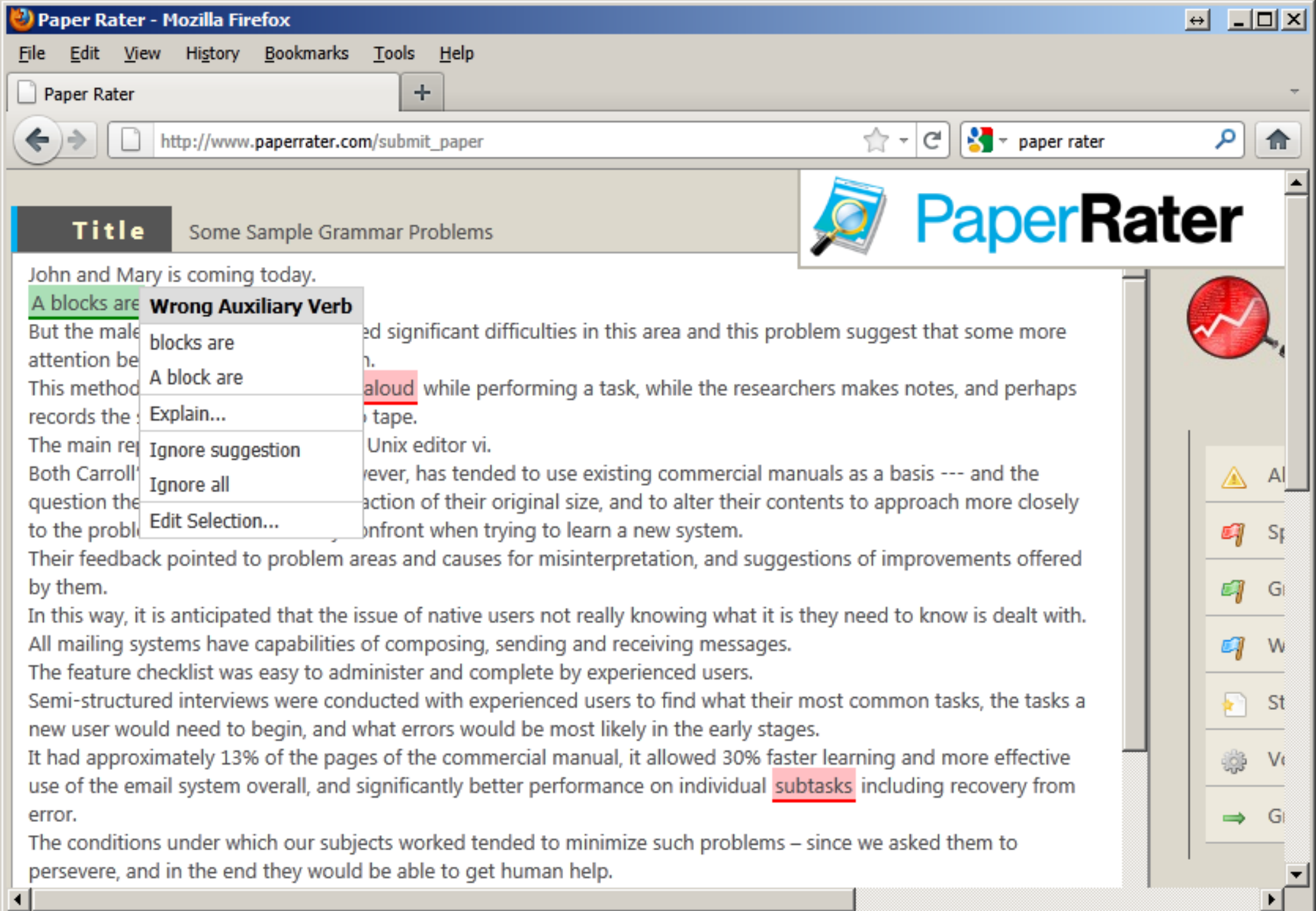
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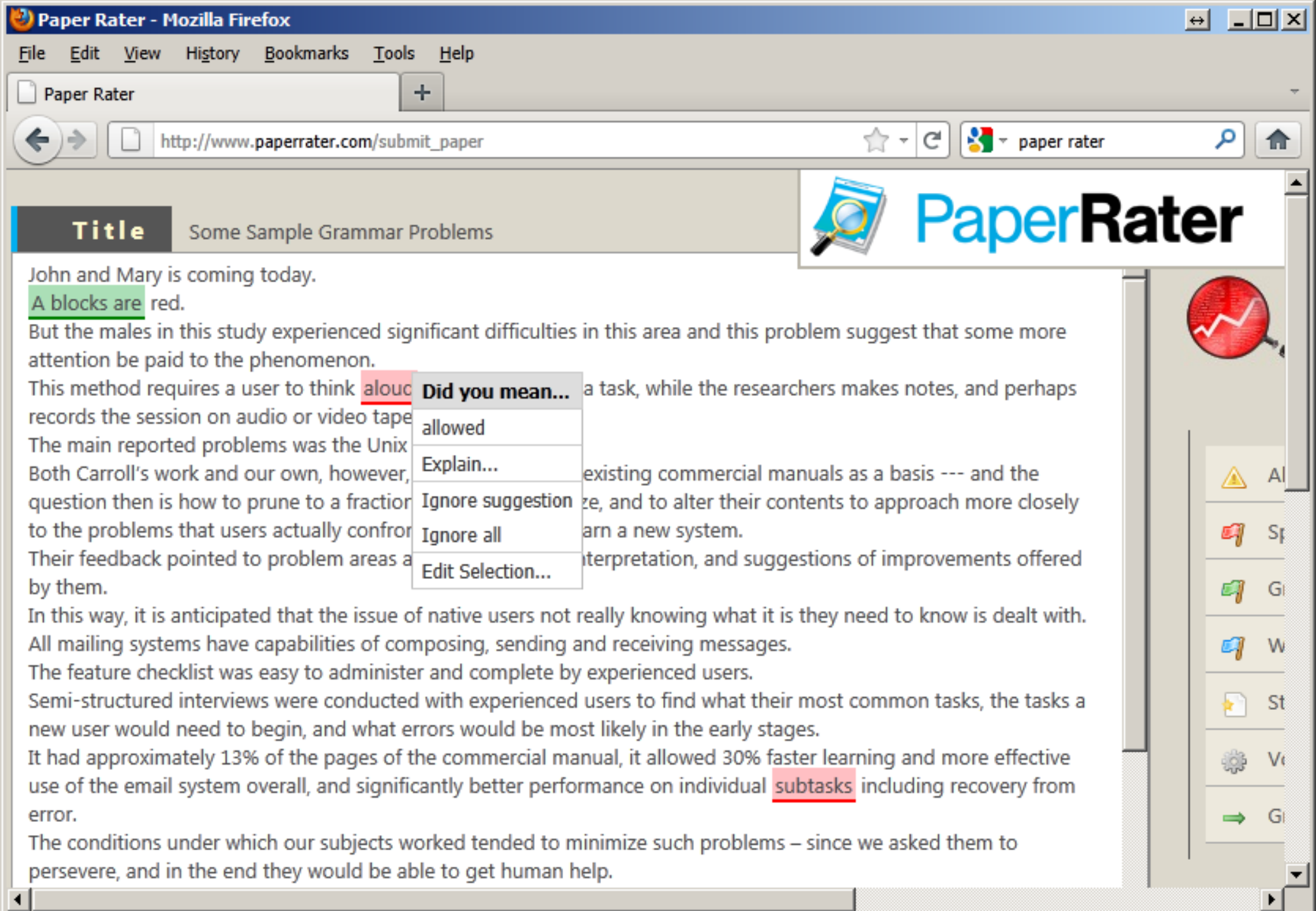
Title
Some Sample Grammar Problems
John and Mary is coming today.
A blocks are
Wrong Auxiliary Verb
blocks are
A block are
Explain...
Ignore suggestion
Ignore all
Edit Selection...
But the male ed significant difficulties in this area and this problem suggest that some more
attention be n.
This method aloud while performing a task, while the researchers makes notes, and perhaps
records the tape.
The main re Unix editor vi.
Both Carroll vever, has tended to use existing commercial manuals as a basis --- and the
question the action of their original size, and to alter their contents to approach more closely
to the probl nfront when trying to learn a new system.
Their feedback pointed to problem areas and causes for misinterpretation, and suggestions of improvements offered by them.
In this way, it is anticipated that the issue of native users not really knowing what it is they need to know is dealt with.
All mailing systems have capabilities of composing, sending and receiving messages.
The feature checklist was easy to administer and complete by experienced users.
Semi-structured interviews were conducted with experienced users to find what their most common tasks, the tasks a new user would need to begin, and what errors would be most likely in the early stages.
It had approximately 13% of the pages of the commercial manual, it allowed 30% faster learning and more effective use of the email system overall, and significantly better performance on individual subtasks including recovery from error.
The conditions under which our subjects worked tended to minimize such problems – since we asked them to persevere, and in the end they would be able to get human help.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Title
Some Sample Grammar Problems
John and Mary is coming today.
A blocks are red.
But the males in this study experienced significant difficulties in this area and this problem suggest that some more attention be paid to the phenomenon.
This method requires a user to think alouc
Did you mean...
allowed
Explain...
Ignore suggestion
Ignore all
Edit Selection...
a task, while the researchers makes notes, and perhaps records the session on audio or video tape
The main reported problems was the Unix
Both Carroll's work and our own, however,
existing commercial manuals as a basis --- and the question then is how to prune to a fraction
ze, and to alter their contents to approach more closely to the problems that users actually confror
arn a new system.
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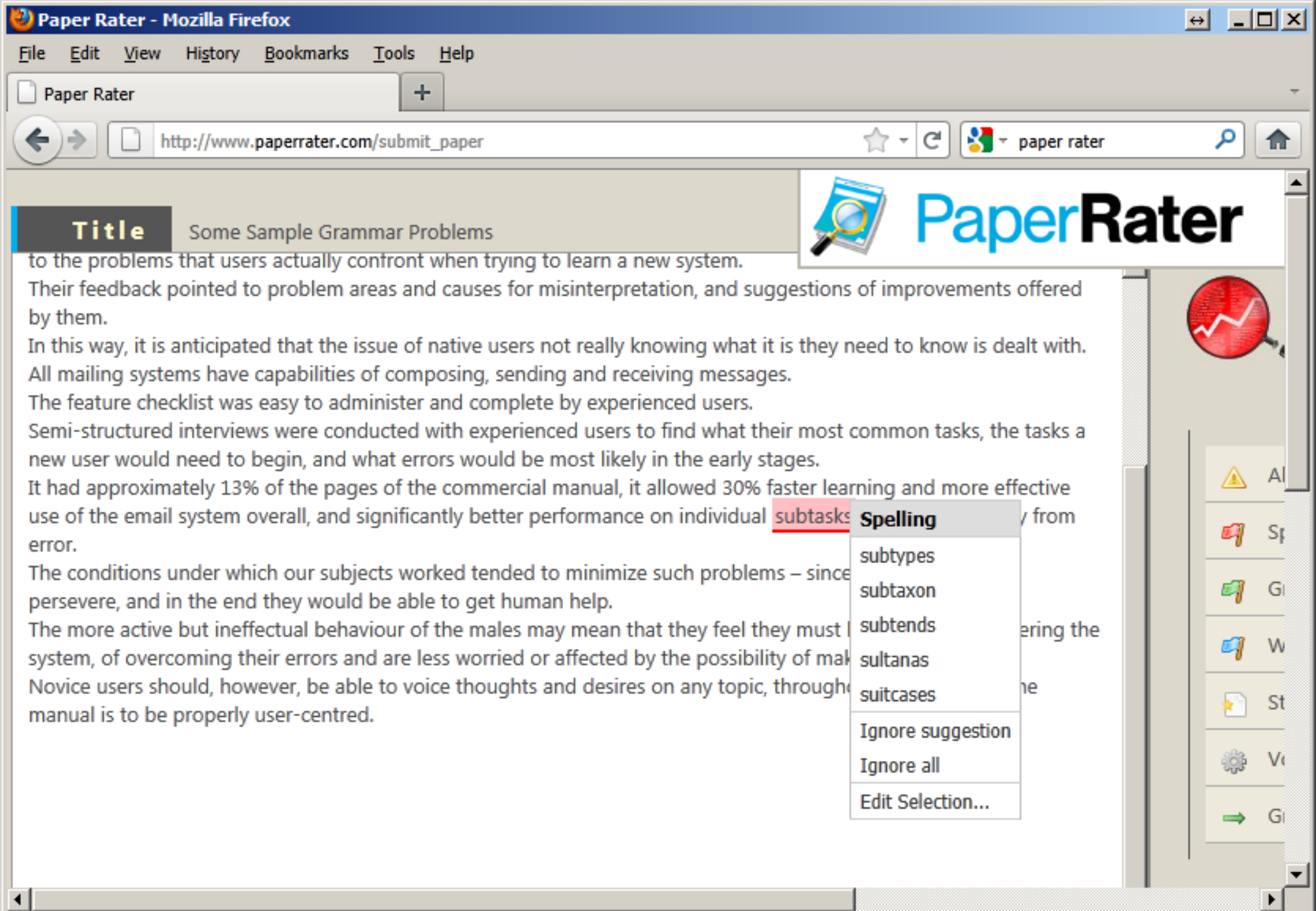
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Some Sample Grammar Problems
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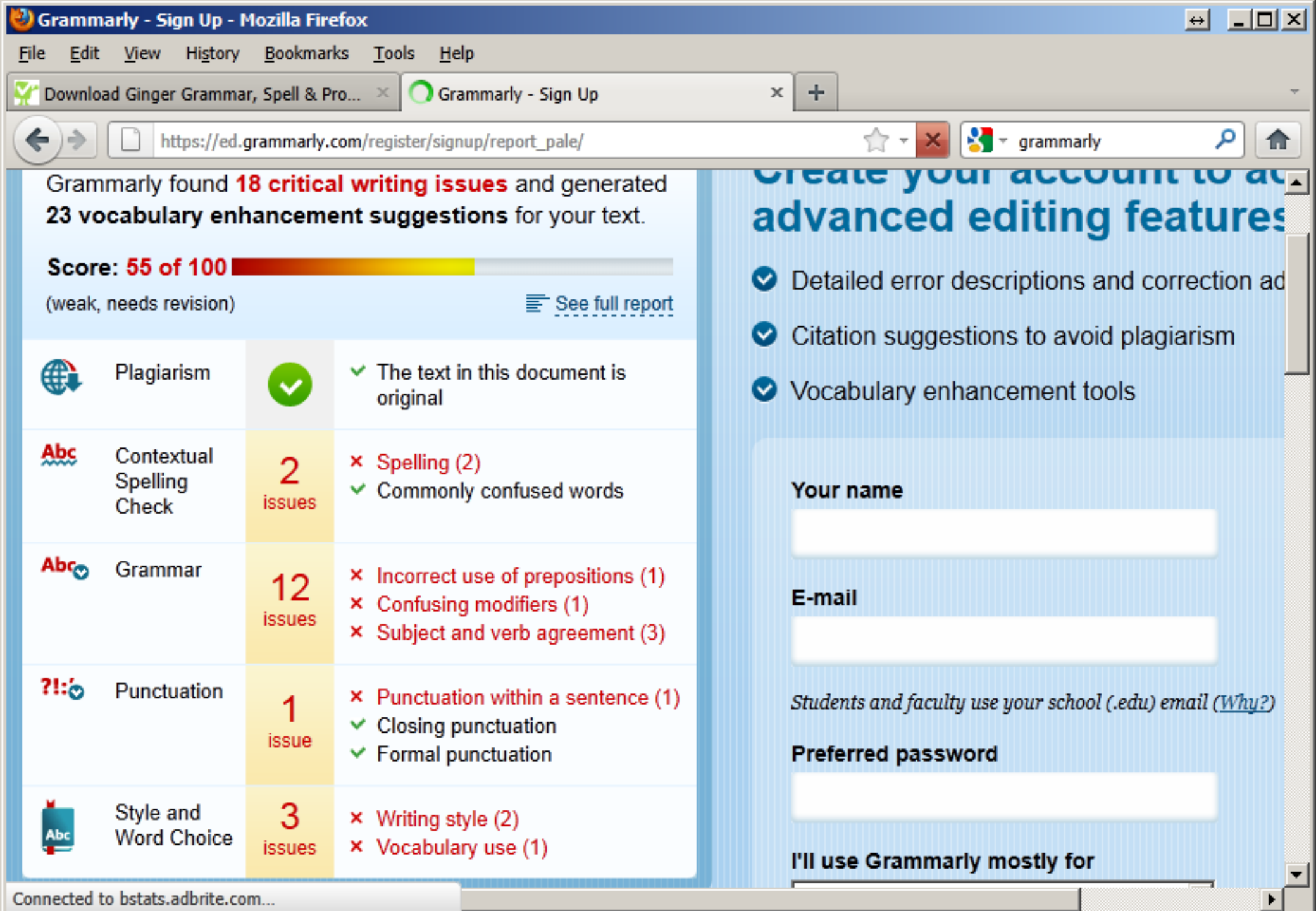
Spelling
subtypes
subtaxon
subtends
sultanas
suitcases
Ignore suggestion
Ignore all
Edit Selection...
from error.
The conditions under which our subjects worked tended to minimize such problems – since
persevere, and in the end they would be able to get human help.
The more active but ineffectual behaviour of the males may mean that they feel they must
ering the system, of overcoming their errors and are less worried or affected by the possibility of mak
Novice users should, however, be able to voice thoughts and desires on any topic, throughe
ne manual is to be properly user-centred.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(weak, needs revision)
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The text in this document is original
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2 issues
Spelling (2)
Commonly confused words
Grammar
12 issues
Incorrect use of prepositions (1)
Confusing modifiers (1)
Subject and verb agreement (3)
Punctuation
1 issue
Punctuation within a sentence (1)
Closing punctuation
Formal punctuation
Style and Word Choice
3 issues
Writing style (2)
Vocabulary use (1)
advanced editing features
Detailed error descriptions and correction ad
Citation suggestions to avoid plagiarism
Vocabulary enhancement tools
Your name
E-mail
Students and faculty use your school (.edu) email (Why?)
Preferred password
I'll use Grammarly mostly for
Connected to bstats.adbrite.com...

Conclusions

- Grammar checking is hard even for humans
- Automated grammar checking is a very unsolved problem
- Grammar checking is not necessarily distinct from spelling checking and style checking
- Many of the problems in real texts are more complex than straightforward textbook grammar errors, and often co-occur with other errors
- There's lots to be done!