The Extended Paraphrase Typology (EPT)

1. Meta categories and structure of the typology

<table>
<thead>
<tr>
<th>Category</th>
<th>Atomic Type</th>
<th>Sense preserving</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Morphology based changes</strong></td>
<td>Inflectional Changes</td>
<td>Positive and negative</td>
</tr>
<tr>
<td></td>
<td>Modal Verb Changes</td>
<td>Positive only</td>
</tr>
<tr>
<td></td>
<td>Derivational Changes</td>
<td>Positive only</td>
</tr>
<tr>
<td><strong>Lexicon based changes</strong></td>
<td>Spelling changes</td>
<td>Positive only</td>
</tr>
<tr>
<td></td>
<td>Same polarity substitution (habitual)</td>
<td>Positive only</td>
</tr>
<tr>
<td></td>
<td>Same polarity substitution (contextual)</td>
<td>Positive and negative</td>
</tr>
<tr>
<td></td>
<td>Same polarity substitution (named entities)</td>
<td>Positive and negative</td>
</tr>
<tr>
<td></td>
<td>Change of format</td>
<td>Positive only</td>
</tr>
<tr>
<td><strong>Lexical-syntactic based changes</strong></td>
<td>Opposite polarity substitution (habitual)</td>
<td>Positive only</td>
</tr>
<tr>
<td></td>
<td>Opposite polarity substitution (contextual)</td>
<td>Positive and negative</td>
</tr>
<tr>
<td></td>
<td>Synthetic/analytic substitution</td>
<td>Positive only</td>
</tr>
<tr>
<td></td>
<td>Modifier</td>
<td>Positive only</td>
</tr>
<tr>
<td></td>
<td>Converse substitution</td>
<td>Positive and negative</td>
</tr>
<tr>
<td><strong>Syntax based changes</strong></td>
<td>Diathesis alternation</td>
<td>Positive and negative</td>
</tr>
<tr>
<td></td>
<td>Negation switching</td>
<td>Positive and negative</td>
</tr>
<tr>
<td></td>
<td>Ellipsis</td>
<td>Positive only</td>
</tr>
<tr>
<td></td>
<td>Coordination changes</td>
<td>Positive only</td>
</tr>
<tr>
<td></td>
<td>Subordination and nesting changes</td>
<td>Positive only</td>
</tr>
<tr>
<td></td>
<td>Argument realization</td>
<td>Positive only</td>
</tr>
<tr>
<td></td>
<td>Genitive</td>
<td>Positive only</td>
</tr>
<tr>
<td><strong>Discourse based changes</strong></td>
<td>Punctuation changes</td>
<td>Positive only</td>
</tr>
<tr>
<td></td>
<td>Direct/indirect style alternations</td>
<td>Positive and negative</td>
</tr>
<tr>
<td></td>
<td>Sentence modality changes</td>
<td>Positive only</td>
</tr>
<tr>
<td></td>
<td>Syntax/discourse structure changes</td>
<td>Positive only</td>
</tr>
<tr>
<td><strong>Other changes</strong></td>
<td>Addition/Deletion</td>
<td>Positive and negative</td>
</tr>
<tr>
<td></td>
<td>Change of order</td>
<td>Positive only</td>
</tr>
<tr>
<td></td>
<td>General Inferences</td>
<td>Positive and negative</td>
</tr>
<tr>
<td><strong>Paraphrase extremes</strong></td>
<td>Identity</td>
<td>Positive only</td>
</tr>
<tr>
<td></td>
<td>Non-paraphrase</td>
<td>Negative only</td>
</tr>
<tr>
<td></td>
<td>Entailment</td>
<td>Positive and negative</td>
</tr>
</tbody>
</table>
2. Examples of atomic types

Morphology based changes

- **Inflectional changes:**
  o Positive sense preserving:
    “It was with difficulty that the course of streets could be followed”
    “You couldn’t even follow the path of the street”
  o Negative sense preserving:
    “You can’t travel from Barcelona to Mallorca with the boat.”
    “Boats can’t travel from Barcelona to Mallorca.”

- **Modal-verb changes:**
  o Positive sense preserving:
    “I was still lost in conjectures who they might be.”
    “I was pondering who they could be.”

- **Derivational changes:**
  o Positive sense preserving:
    “I have heard many accounts of him all differing from each other.”
    “I have heard many different things about him.”

Lexicon based changes

- **Spelling changes:**
  o Positive sense preserving:
    “doesn’t fit the company’s long-term strategy.”
    “does not fit in our long-term growth strategy.”

- **Same-polarity substitution (habitual):**
  o Positive sense preserving:
    “A federal magistrate in Fort Lauderdale ordered him held without bail.”
    “Zuccarini was ordered held without bail Wednesday by a federal judge in Fort Lauderdale, Fla.”

- **Same-polarity substitution (contextual):**
  o Positive sense preserving:
    “Meanwhile, the global death toll approached 770 with more than 8,300 people sickened since the severe acute respiratory syndrome virus first appeared in southern China in November.”
    “The global death toll from SARS was at least 767, with more than 8,300 people sickened since the virus first appeared in southern China in November.”

  o Negative sense preserving:
    “The loonie, meanwhile, continued to slip in early trading Friday.”
“The loonie, meanwhile, was on the rise again early Thursday.”

- **Same-polarity substitution (named entities):**
  o Positive sense preserving:
    He told The Sun newspaper that Mr. Hussein’s daughters had British schools and hospitals in mind when they decided to ask for asylum.”
    “Saddam’s daughters had British schools and hospitals in mind when they decided to ask for asylum -- especially the schools,” he told The Sun.”

  o Negative sense preserving:
    “Yucaipa owned Dominick’s before selling the chain to Safeway in 1998 for $2.5 billion.”
    “Yucaipa bought Dominick’s in 1995 for $693 million and sold it to Safeway for $1.8 billion in 1998.”

- **Change of format:**
  o Positive sense preserving:
    “fell 1.5%”
    “fell 1.5 percent”

- **Lexical-syntactic based changes**

- **Opposite-polarity substitution (habitual):**
  o Positive sense preserving:
    “Leicester failed in both enterprises.”
    “He did not succeed in either case.”

- **Opposite-polarity substitution (contextual):**
  o Positive sense preserving:
    “A big surge in consumer confidence has provided the only positive economic news in recent weeks.”
    “Only a big surge in consumer confidence has interrupted the bleak economic news.”

  o Negative sense preserving:
    “Johnson quickly accepted the proposal.”
    “Johnson rejected the proposal without hesitation.”

- **Synthetic/analytic substitution**
  o Positive sense preserving:
    “A sequence of ideas”
    “ideas”

- **Modifier**
  o Positive sense preserving:
    “Doña Porcela is a respected traditional healer.”
    “Doña Porcela is a healer.”
- **Converse substitution**
  
  o Positive sense preserving:
    “The Geological society of London in 1855 **awarded to him** the Wollaston medal.”
    “Resulted in him **receiving** the Wollaston medal **from** the Geological society in London in 1855.”

  o Negative sense preserving:
    “Last Monday, John **bought** the new black car **from** his friend Sam.”
    “Last week, John **sold** his black car to Sam, his friend from high school.”

- **Diathesis alternation**

  o Positive sense preserving:
    “The guide **drew our attention to** a gloomy little dungeon.”
    “Our attention **was drawn by** our guide **to** a little dungeon.”

  o Negative sense preserving:
    “The president **gave** a speech about his plan to change the Constitution.”
    “The president **was given** a speech about his plan **to** change the Constitution.”

- **Negation switching**

  o Positive sense preserving:
    In order to move us, it needs **no** reference to any recognized original.”
    “One **does not** need to recognize a tangible object to be moved by its artistic representation.”

  o Negative sense preserving:
    “Frege **did not** say that Hesperus is Phosphorus.”
    “Frege said that Hesperus is **not** Phosphorus.”

- **Ellipsis**

  o Positive sense preserving:
    “In the scenes with Iago he equaled Salvini, yet did not in any one point surpass him.”
    “He equaled Salvini, in the scenes with Iago, but he did not in any point surpass him or imitate him.”

- **Coordination changes**

  o Positive sense preserving:
    “It is estimated that he spent nearly $10,000 on these works. In addition he published a large number of separate papers.”
    “Altogether these works cost him almost $10,000 and he wrote of small papers as well.”

- **Subordination and nesting changes**

  o Positive sense preserving:
“The Russian law, which limits the percentage of Jewish pupils in any school, barred his admission.”
“The Russian law had limits for Jewish students so they barred his admission.”

- **Argument realization**
  - Positive sense preserving:
    “British writer Doris Lessing, recipient of the 2007 Nobel Prize in Literature.”
    “Doris Lessing won the Nobel Prize in Literature in 2007.”

- **Genitive**
  - Positive sense preserving:
    “Mexico’s new president”
    “New president of Mexico”

**Discourse based changes**

- **Punctuation changes**
  - Positive sense preserving:
    “Swartz repaid it in full, **with interest**, according to his lawyer, Charles Stillman.”
    “Swartz repaid it **with interest**, according to his lawyer, Charles Stillman.”

- **Direct/indirect style alternations**
  - Positive sense preserving:
    “She is mine”, said the Great Spirit.
    The Great Spirit said that she is hers.

  - Negative sense preserving:
    “I’m on my way!”, said Peter and hung up his phone.
    Peter called Ana to tell her that she is on her way.

- **Sentence modality changes**
  - Positive sense preserving:
    “The real question is, will it pay? Will it please Theophilus P. Polk or vex Harriman Q. Kunz?”
    “He do it just for earning money or to please Theophilys P. Polk or vex Hariman Q. Kunz.”

- **Syntax/discourse structure changes**
  - Positive sense preserving:
    “How he would stare!”
    “He would surely stare!”
Other changes

- **Addition/Deletion**
  - Positive sense preserving:
    “One day, she took a hot flat-iron, removed my clothes, and held it on my naked back until I howled with pain.”
    “As a proof of bad treatment, she took a hot flat-iron and put it on my back after removing my clothes.”
  - Negative sense preserving:
    “Legislation making it harder for consumers to erase their debts in bankruptcy court won overwhelming House approval in March.”
    “Legislation making it harder for consumers to erase their debts in bankruptcy court won speedy, House approval in March and was endorsed by the White House.”

- **Change of order**
  - Positive sense preserving:
    “First, we came to the tall palm trees.”
    “We got to some rather biggish palm trees first.”

- **General Inferences**
  - Positive sense preserving:
    “Uncle Tarek was born Aribert Ferdinand Heim.”
    “The real name of Tarek Hussein Farid was Aribert Ferdinand Heim.”
  - Negative sense preserving:
    “Children were among the victims of a plane crash that killed as many as 17 people Sunday in Butte, Montana.”
    “17 adults died in a plane crash in Montana.”

- **Semantic based**
  - Positive sense preserving:
    “The scenery was altogether more tropical.”
    “Which added to the tropical appearance.”