The AUTOTYP Research Program

Balthasar Bickel

University of Leipzig

http://www.uni-leipzig.de/~bickel
Background
Background

- The research group
  - Johanna Nichols (Co-Director, Berkeley)
  - Balthasar Bickel (Co-Director, Leipzig)
  - Fernando Zúñiga (Post-Doc, Leipzig)
  - Sandra Biewald (RA, Leipzig)
  - Aimee Lahaussois-Bartosik (RA, Berkeley, until 2002)
  - Michael Riessler (RA, Leipzig)
  - Suzanne Wilhite (RA, Berkeley)
  - Alena Witzlack-Makerevich (RA, Leipzig)
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• Launched in 1996, current framework in early 2001
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- Current funding: Swiss NSF 08210-053455 and 610-0627 (Bickel); US NSF 96-16448 (Nichols)
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• www.uni-leipzig.de/~autotyp
General goals
General goals

1. develop cross-linguistically viable analytical terms as input to:
General goals

1. develop cross-linguistically viable analytical terms as input to:
   • field linguistics
General goals

1. develop cross-linguistically viable analytical terms as input to:
   • field linguistics
   • theoretical linguistics
General goals

1. develop cross-linguistically viable analytical terms as input to:
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   - theoretical linguistics

2. detect and explain distributional patterns:
General goals

1. develop cross-linguistically viable analytical terms as input to:
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   • theoretical linguistics

2. detect and explain distributional patterns:
   • geographical patterns
General goals

1. develop cross-linguistically viable analytical terms as input to:
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2. detect and explain distributional patterns:
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   • structural relationships and discourse effects
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3. produce statistical estimates on:
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   • genetic inheritance potentials
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3. produce statistical estimates on:
   • genetic inheritance potentials
   • areal diffusion potentials
   • independent development potentials (universal preferences)
Projects

gramm. relations
Projects

backbone projects

gramm. relations
Projects

backbone projects

genetic affiliation (613)

gramm. relations
Projects

backbone projects

- genetic affiliation (613)
- geographical location (480)

gramm. relations
Projects

backbone projects

- genetic affiliation (613)
- geographical location (480)

- sampling

- bibliography

gramm. relations
Projects

backbone projects

- genetic affiliation (613)
- geographical location (480)
  - sampling
  - bibliography
  - statistics

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gramm. relations

thematic projects
Projects

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thematic projects

- morphology and phonology of grammatical markers (337)

gramm. relations

sampling

bibliography

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- morphology and phonology of grammatical markers (337)
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- Statistics

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Just now starting:
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just now starting:

word domains
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just now starting:
- word domains
- clause linkage
AUTOTYP Principles
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• **Autotypology:** Inventory of elements, types, etc. grows out of inputting and definitions. No predefined categories (no etic grids, no conceptual spaces, etc.)
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• **High resolution:** Breakdown of descriptive notions into smallest units.
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- **Modularity:** Separate thematically defined files linked relationally (via language ID code)
**AUTOTYP Principles**

- **Autotypology:** Inventory of elements, types, etc. grows out of inputting and definitions. No predefined categories (no etic grids, no conceptual spaces, etc.)

- **High resolution:** Breakdown of descriptive notions into smallest units.

- **Modularity:** Separate thematically defined files linked relationally (via language ID code)

- **Connectivity:** Compatible with any database using some language ID codes (e.g., SIL codes)
Database structure
Database structure

• backbone module
Database structure

- backbone module
  - genetic affiliation (available on-line)
Database structure

• backbone module

  • genetic affiliation (available on-line)

  • geographical location (coordinates, zones of various sizes)
Database structure

- backbone module
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- samples
Sampling
Sampling

- open-ended data collection for qualitative typology — *goal*: all possible types or within types, all tokens
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- various samples for quantitative typology — *goal*: detect and explain distributions in the world, in an area, in a stock, etc.
Sampling

- open-ended data collection for qualitative typology — *goal*: all possible types or within types, all tokens

- various samples for quantitative typology — *goal*: detect and explain distributions in the world, in an area, in a stock, etc.

- Most commonly used sample for exploratory research on world-wide distributions is a genetically-balanced sample:
Sampling (cont’d)

- Languages in database (approximate)
- Genetically-balanced sample "Gen1+" (N=300)
Database structure (cont’d)

- backbone module
  - genetic affiliation (available on-line)
  - geographical location(coordinates, zones)
  - samples (allowing multiple sampling)
Database structure (cont’d)

• backbone module
  • genetic affiliation (available on-line)
  • geographical location(coordinates, zones)
  • samples (allowing multiple sampling)
  • bibliography (currently in EndNote™ format)
Database structure (cont’d)

- backbone module
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- service module
Database structure (cont’d)

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- service module
  - language logs (.doc, .pdf)
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- service module
  - language logs (.doc, .pdf)
  - database log
  - input monitor
  - survey monitor
Database structure (cont’d)
Database structure *(cont’d)*

- map-making and analysis tools
Database structure (cont’d)

• map-making and analysis tools
  (currently Excel™ scatterplots, SPSS™, R, etc.)
Database structure (cont’d)

• map-making and analysis tools
  (currently Excel™ scatterplots, SPSS™, R, etc.)
• data files
**Database structure (cont’d)**

- map-making and analysis tools  
  (currently Excel™ scatterplots, SPSS™, R, etc.)
- data files
- definition files
How does autotypologizing work?
How does autotypologizing work?

• **Data files** assign types to data
How does autotypologizing work?

- **Data files** assign types to data
  - alienability (261 languages)
  - covert categories (23 languages)
  - inclusive/exclusive (368 languages)
  - grammatical markers (337 languages)
  - locus per role (273 languages)
  - morphological alignment (270 languages)
  - NP structure (401 languages)
  - grammatical relations (22 languages)
  - synthesis (150 languages)

*Under development: clause linkage, experiencer downgrading, agreement types, etc.*
How does autotypologizing work? *(cont’d)*

- **Data files** assign types to data
How does autotypologizing work? (cont’d)

- **Data files** assign types to data
- **Definition files** define these types
How does autotypologizing work? (cont’d)

• **Data files** assign types to data
  • **Definition files** define these types
    - alignment
    - classification_type
    - cryptotypes
    - exemplars
    - exp_coding_type
    - flexivity
    - fusion
    - locus
    - morph_behavior
    - morph_source
    - np_patterns
    - parts_of_speech
    - position
    - poss_distinctions
    - sem_class
    - syn_constraints
    - syn_patterns
    - syn_roles
    - word_order
Example 1: NP structure files

np_structure: what formattives establish complex NPs?
Example 1: NP structure files

np_structure: what formatives establish complex NPs?
Relationally linked to:
Example 1: NP structure files

**np_structure**: what formatives establish complex NPs?

Relationally linked to:
- definition files
Example 1: NP structure files

np_structure: what formatives establish complex NPs?

Relationally linked to:
- definition files
- other data files
Example 1: NP structure files

np_structure: what formative elements establish complex NPs?

Relationally linked to:

- definition files
- other data files
- backbone modules on the language
<table>
<thead>
<tr>
<th>Formative #1</th>
<th>POSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locus:</td>
<td>II</td>
</tr>
<tr>
<td>Source:</td>
<td>assign</td>
</tr>
<tr>
<td>Fusion:</td>
<td>Concatenative</td>
</tr>
<tr>
<td>Type:</td>
<td>Formative</td>
</tr>
</tbody>
</table>

| Alienability: | alienable |
| Word order:   | Head-Dependent |

| Dependent:   |
| Part(s) of speech: | 211 |

| Lex/sem. class: |

| Head noun: |
| Lex./sem. classes: | neutral |

| Examples: |
| gwo'lk à lóöE (dog PTC man) ‘the man's dog’ (E = shwa) |

| Comments: |
| Linker is enclitic and ad-head; geminates a final consonant of preceding word (head). Same linker occurs in attributive NP's. |

backbone modules:
- genetic affil.
- location
- areas
- sampling
**Formative #1**
- **Locus:** 
- **Source:** assign
- **Fusion:** Concatenative
- **Type:** Formative

**Formative #2**
- **Locus:** 
- **Source:** 
- **Fusion:** 
- **Type:** 

**Formative #3**
- **Locus:** 
- **Source:** 
- **Fusion:** 
- **Type:** 

**Cryptotypically identified by:**

**Examples:**
- *gwo’lk à ləc’E (dog PTC man) ‘the man’s dog’ (E = [s]hwa)*

**Comments:**
- Linker is enclitic and ad-head; geminates a final consonant of preceding word (head). Same linker occurs in attributive NP’s.
sem_class.def
word_order.def
sem_class.def
**np_structure**

**NP structure type:** 1 Construct state

<table>
<thead>
<tr>
<th>Formative #1</th>
<th>POS</th>
<th>Locus</th>
<th>Source</th>
<th>Fusion</th>
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</tr>
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<tr>
<td></td>
<td>POSS</td>
<td>II</td>
<td>assign</td>
<td>Concatenative</td>
<td>Formative</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Formative #2</th>
<th>Locus</th>
<th>Source</th>
<th>Fusion</th>
<th>Type</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Formative #3</th>
<th>Locus</th>
<th>Source</th>
<th>Fusion</th>
<th>Type</th>
</tr>
</thead>
</table>

**Cryptotypically identified by:**

**Examples:**

| gwo’lk à lôc’E (dog PTC man) ‘the man’s dog’ (E = sohwa) |

**Comments:**

Linker is enclitic and ad-head; geminates a final consonant of preceding word (head). Same linker occurs in attributive NP’s.

**Source:** Noonan 1992 and p.c.

**Compiler:** JN11 5 00, 11 23 00, DD 05/22/01

---

**np_patterns.def**
Example 1: NP structure files (cont’d)

The np_patterns.def file

<table>
<thead>
<tr>
<th>NPP_ID</th>
<th>NP_Patterns</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Construct state</td>
<td>registers presence of dependent (includes izafet, ezafe, linkers, possessive words, sandhi, construct state)</td>
</tr>
<tr>
<td>2</td>
<td>Head-driven agreement</td>
<td>e.g. gender or number agreement, as triggered by the head noun (not by something external to the head noun)</td>
</tr>
<tr>
<td>3</td>
<td>Governed</td>
<td>i.e. cases, adpositions, case words that are assigned by a head to a dependent</td>
</tr>
<tr>
<td>4</td>
<td>Incorporation</td>
<td>e.g. possessor ascension (in verbs)</td>
</tr>
<tr>
<td>5</td>
<td>Juxtaposition</td>
<td>unmarked sequence of nouns</td>
</tr>
<tr>
<td>6</td>
<td>Attributive</td>
<td>Change of word class of possessor (usually together with agreement) (e.g. classical IE possessive pronouns)</td>
</tr>
<tr>
<td>7</td>
<td>Anti-construct</td>
<td>Registers presence of head.</td>
</tr>
<tr>
<td>8</td>
<td>Head-driven agr. + Governed</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Pronominal agreement</td>
<td>Including overtized pronouns. Includes dependent-marking overtized to head.</td>
</tr>
<tr>
<td>10</td>
<td>Construct state + Governed</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Modifier-headed agreement</td>
<td>Adjective or other modifier is head of NP (as indicated e.g. in NP-internal agreement). Examples: Wari, Belhara.</td>
</tr>
<tr>
<td>12</td>
<td>External-driven agreement</td>
<td>= case stacking or spreading. Case spreading is the same as case agreement if it is triggered not by the head noun but by the modifier.</td>
</tr>
<tr>
<td>13</td>
<td>External-driven agr. + Governed</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Dep-driven agreement</td>
<td>e.g. possessive agreement affixes; also, isolating formatives in the form of pronoun: tiger [he skin] or tiger [his skin]</td>
</tr>
<tr>
<td>15</td>
<td>Dep-driven agr. + Governed</td>
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<tr>
<td>16</td>
<td>Dep-driven agr. + Construct state</td>
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</tr>
<tr>
<td>17</td>
<td>Dep-driven agr. + Class/poss. noun</td>
<td>Agreement is not hosted by head but by a classificatory (more general) noun adjacent to it. This is a subtype of Consp. n. + Construct state</td>
</tr>
<tr>
<td>18</td>
<td>Pronom. agr. + Construct state</td>
<td></td>
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<tr>
<td>19</td>
<td>Linker</td>
<td>Registers presence of head-dependent relation (neither ad-head nor ad-dependent, but truly ad-phrase)</td>
</tr>
<tr>
<td>20</td>
<td>Head-driven agr. + Construct state</td>
<td>Uncertain. Needs further analysis</td>
</tr>
<tr>
<td>21</td>
<td>Class/poss. noun</td>
<td>A subtype of construct state but marked by a syntactic word. This syntactic word signals the presence of a dependent.</td>
</tr>
<tr>
<td>22</td>
<td>Compound</td>
<td>Like juxtaposition but morphophonologically bound into a single word</td>
</tr>
<tr>
<td>23</td>
<td>Compound + Governed</td>
<td>(Compound with a case-marked dependent)</td>
</tr>
<tr>
<td>24</td>
<td>Externally Possessed</td>
<td>Possessor is outside NP, wherever. Example: Kiowa</td>
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Example 1: NP structure files (cont’d)

The np_patterns.def file

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Head noun: | Lex./sem. classes: |
5 kin terms
10 body parts
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Examples:

Comments:

Source: Noonan 1992
Compiler: JN 11-5-00, 11-23-00
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## np_structure

**NP structure type:** Pronominal agr. + Construct state

### Formative #1: POSS-ALIEN
- **Locus:** H
- **Source:** agree
- **Fusion:** Prosodic template
- **Type:** Formative

### Formative #2: POSS-AGR
- **Locus:** H
- **Source:** agree
- **Fusion:** Conventional
- **Type:** Formative

### Formative #3
- **Locus:**
- **Source:**
- **Fusion:**
- **Type:**

**Cryptotypically identified by:**

### Examples:

**Source:** Noonan 1992

**Comments:**
158ff. Px has first consonant geminated, for alienables only.
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<td>Adjective or other modifier is head of NP (as indicated e.g. in NP-internal agreement). Examples: Wari, Belhare.</td>
</tr>
<tr>
<td>12</td>
<td>External-driven agreement</td>
<td>= case stacking or spreading. Case spreading is the same as case agreement if it is triggered not by the head noun but by a modifier or another grammatical word.</td>
</tr>
<tr>
<td>13</td>
<td>External-driven agr. + Governed</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Dep-driven agreement</td>
<td>e.g. possessive agreement affixes; also, isolating formatives in the form of pronoun: tiger (he skin) or tiger (his skin)</td>
</tr>
<tr>
<td>15</td>
<td>Dep-driven agr. + Governed</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Dep-driven agr. + Construct state</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Dep-driven agr. + Class/poss. noun</td>
<td>Agreement is not hosted by head but by a classifiericatory (more general) noun adjacent to it. This is a subtype of Const</td>
</tr>
<tr>
<td>18</td>
<td>Pronomin agr. + Construct state</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Linker</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Head-driven agr. + Construct state</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>(?)</td>
<td>Unspecified. Needs further analysis</td>
</tr>
<tr>
<td>22</td>
<td>Class/poss. noun</td>
<td>A subtype of construct state but marked by a syntactic word. This syntactic word signals the presence of a dependent.</td>
</tr>
<tr>
<td>23</td>
<td>Compound</td>
<td>Like juxtaposition but morphophonologically bound into a single word</td>
</tr>
<tr>
<td>24</td>
<td>Compound + Governed</td>
<td>(Compound with a case-marked dependent)</td>
</tr>
<tr>
<td>25</td>
<td>Externally Possessed</td>
<td>possessor is outside NP, wherever. Example: Kiowa</td>
</tr>
</tbody>
</table>
Example 1: NP structure files (cont’d)

Discovery of new combinations of types as a side-effect of data collection
Example 1: NP structure files (cont’d)

Discovery of new combinations of types, but also discovery of new types as side-effect of data collection

= Autotypology
Example 1: NP structure files (*cont’d*)

- Discovery of new combinations of types, but also discovery of new types as side-effect of data collection

  = Autotypology

Example: Modifier-headed agreement (#11)
Discovery of new combinations of types, but also discovery of new types as side-effect of data collection

= Autotypology

Example: Modifier-headed agreement (#11)

_Wari’_ (Everett & Kern 1997)

`mixem nucun wom`
black poss:3sm cotton

‘dirty clothes’
(lit. ‘the cotton’s blackness’)
Discovery of new combinations of types, but also discovery of new types as side-effect of data collection

= Autotypology

Example: Modifier-headed agreement (#11)

_Wari_’ (Everett & Kern 1997)

_Mam mao 'in-on ca mixem nucun wom-u_

with _go:s 1s:REALIS-3sm REALIS black poss:3sm cotton-1s_

‘I went with my dirty clothes’
(lit. ‘with my cotton’s blackness’)
Example: NP structure files (cont’d)

<table>
<thead>
<tr>
<th>NPP_ID</th>
<th>NP_Patterns</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Construct state</td>
<td>registers presence of dependent (includes izafet, ezafte, linkers, possessive words, sandhi, construct state)</td>
</tr>
<tr>
<td>2</td>
<td>Head-driven agreement</td>
<td>e.g. gender or number agreement, as triggered by the head noun (not by something external to the head noun)</td>
</tr>
<tr>
<td>3</td>
<td>Governed</td>
<td>i.e. cases, adpositions, case words that are assigned by a head to a dependent</td>
</tr>
<tr>
<td>4</td>
<td>Incorporation</td>
<td>e.g. possessor assignment (in verbs)</td>
</tr>
<tr>
<td>5</td>
<td>Juxtaposition</td>
<td>unmarked sequence of nouns</td>
</tr>
<tr>
<td>6</td>
<td>Attributive</td>
<td>Change of word class of possessor (usually together with agreement) (e.g. classical IE possessive pronouns)</td>
</tr>
<tr>
<td>7</td>
<td>Anti-construct</td>
<td>Registers presence of head.</td>
</tr>
<tr>
<td>8</td>
<td>Head-driven agr. + Governed</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Pronominal agreement</td>
<td>Including cliticized pronouns. Includes dependent-marking cliticized to head.</td>
</tr>
<tr>
<td>10</td>
<td>Construct state + Governed</td>
<td></td>
</tr>
<tr>
<td>11</td>
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<td>12</td>
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</tr>
<tr>
<td>13</td>
<td>External-driven agr. + Governed</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Deep-driven agreement</td>
<td>e.g. possessive agreement affixes; also, isolating formatives in the form of pronoun: tiger [he skin] or tiger [his skin]</td>
</tr>
<tr>
<td>15</td>
<td>Deep-driven agr. + Governed</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Deep-driven agr. + Construct state</td>
<td></td>
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<td>17</td>
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<td>Agreement is not hosted by head but by a classificatory (more general) noun adjacent to it. This is a subtype of Construct state.</td>
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<tr>
<td>18</td>
<td>Pronominal agr. + Construct state</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Linker</td>
<td>Registers presence of head-dependent relation (neither ad-head nor ad-dependent, but truly ad-phrase)</td>
</tr>
<tr>
<td>20</td>
<td>Head-driven agr. + Construct state</td>
<td>Uncertain. Needs further analysis</td>
</tr>
<tr>
<td>21</td>
<td>Class/poss. noun</td>
<td>A subtype of construct state but marked by a syntactic word. This syntactic word signals the presence of a dependent.</td>
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</tr>
</tbody>
</table>
Example: NP structure files (cont’d)

Also necessitates new type in locus.def
<table>
<thead>
<tr>
<th>LoeID</th>
<th>Locus</th>
<th>BasioLocus</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>H</td>
<td>on head</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>D</td>
<td>on dependent. For zero formative as D, see 10 below.</td>
<td></td>
</tr>
<tr>
<td>H+D</td>
<td>2</td>
<td>simultaneously, or mostly simultaneously on head and dependent</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>F</td>
<td>free or floating, including Wackernagel 'linkers'</td>
<td></td>
</tr>
<tr>
<td>F+D</td>
<td>2</td>
<td>simultaneously, or mostly simultaneously detached and on dependent (e.g. Wackernagel agreement)</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>n/a</td>
<td>the relation is marked by position</td>
<td></td>
</tr>
<tr>
<td>n/a</td>
<td>n/a</td>
<td>not applicable</td>
<td></td>
</tr>
<tr>
<td>h+d</td>
<td>2</td>
<td>Dependent marking is dominant. Additional head marking with some verbs only or under specific</td>
<td></td>
</tr>
<tr>
<td>H+h</td>
<td>H</td>
<td>Head marking is dominant. Additional dependent marking with some NPs or under specific</td>
<td></td>
</tr>
<tr>
<td>h+d</td>
<td>D</td>
<td>Head marking that is available only on a limited set of NPs or under specific morphosyntactic</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>H</td>
<td>on head, with more than one formative or more than one category. Typical case: genitive or</td>
<td></td>
</tr>
<tr>
<td>Hh</td>
<td>H</td>
<td>on head, with more than one formative or more than one category. Typical case: construct state</td>
<td></td>
</tr>
<tr>
<td>hh</td>
<td>H</td>
<td>on head, with more than one formative or more than one category, but both formatives have</td>
<td></td>
</tr>
<tr>
<td>h</td>
<td>H'</td>
<td>NP-internal head in a modifier-headed agreement pattern</td>
<td></td>
</tr>
<tr>
<td>d on H</td>
<td>D on H</td>
<td>Headward-migrated dependent marking. Typical case: Arabic or Irish pronominal agreement,</td>
<td></td>
</tr>
<tr>
<td>h+d on h</td>
<td>D on H</td>
<td>Head-marking (construct state type) plus headward-migrated dependent-marked pronouns</td>
<td></td>
</tr>
<tr>
<td>H+h+D</td>
<td>2</td>
<td>Head-marking (construct state type) plus headward-migrated dependent-marked pronouns</td>
<td></td>
</tr>
<tr>
<td>H+D+H</td>
<td>D on H</td>
<td>Head-marking (construct state type) plus headward-migrated dependent-marked pronouns</td>
<td></td>
</tr>
<tr>
<td>2?</td>
<td>n/a</td>
<td>uncertain data (usually with possessive relators that could be F [=linker], D [=case] or H</td>
<td></td>
</tr>
<tr>
<td>&lt;n.d.</td>
<td>n.d.</td>
<td>No information available.</td>
<td></td>
</tr>
<tr>
<td>H/D</td>
<td>D/H</td>
<td>E.g. inalienables take H or D+H; alienables take only D.</td>
<td></td>
</tr>
<tr>
<td>H/D</td>
<td>H/D</td>
<td>Split, either H or D.</td>
<td></td>
</tr>
<tr>
<td>D + D on H</td>
<td>D on H</td>
<td>Floating, under limited circumstances (e.g. Yagua DOM by floating agreement with definite noun)</td>
<td></td>
</tr>
<tr>
<td>H+F</td>
<td>F</td>
<td>Floating, under limited circumstances (e.g. Yagua DOM by floating agreement with definite noun)</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>H</td>
<td>Head plus floating</td>
<td></td>
</tr>
</tbody>
</table>
Example 1: NP structure files (cont’d)

Other instances of type #11 modifier-headed NPs:

• Amharic
• Komi (and other Uralic languages)
• Japanese (?)
• Limbu (frozen forms, non-productive)
Example 2: Formative fusion
Example 2: Formative fusion

Formative #1 302 POSS-ALIEN
- Locus: H
- Source: agree
- Fusion: Prosodic template
- Type: Formative

Formative #2 303 POSS-AGR
- Locus: H
- Source: agree
- Fusion: Conjunction
- Type: Formative

Formative #3
- Locus: 
- Source: 
- Fusion: 
- Type: 

Cryptotypically identified by:
- 

Examples:
- 

Comments:
- 158ff. Px has first consonant geminated, for aliens only.

Source: Noonan 1992
Compiler: JN 11-5-00, 11-23-00, BB
### Example 2: Formative fusion

**Formative #1:** POSS-ALIEN
- **Locus:** H
- **Source:** agree
- **Fusion:** Prosodic template
- **Type:** Formative

**Alienability:** 1 alienable

**Feed order:**

**Dependent:** Part(s) of speech: 5 Pro

**Lex/sem. class:**

**Head noun:**

**Lex./sem. classes:**

and:

**Cryptotypically identified by:**

**Examples:**

| Source: | Noonan 1992 |
| Compiler: | JN 11-5-00, 11-23-00, BB |

**Comments:**

159ff. Px has first consonant geminated, for alienables only.
**Form:** Gemination of stem-final C (There is no effect if stem ends in y, but a regular contraction process leading to V-deletion makes geminates gemination applicable again.)

**Morpheme Type:** Formative

**Fusion:** N/A

**Stem Flexivity:** None

**Fmtve Flexivity:** N/A

**Lucas:** 1H

**Position:** Post

**Behavior:** N/A

**Source of Marking:** 2agree

**Host restrictions:** ?H

**Exonomy:** 1 cpn., covering: 2Poss Gen.

**Roles covered:**

**Marginally covered:**

**TAM values covered:**

**Defines syntactic constraint:**

**Description and general comments:** Lango gemination + possessive suffix

**Examples:**

**Sources:** Noonan 1992: 158ff

**Compiler:** JN/BB
<table>
<thead>
<tr>
<th>Morpheme Type</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>FUSION</td>
<td>Phoeodic temple</td>
</tr>
</tbody>
</table>

Form: Geminination of stem-final C (There is no effect if stem ends in a Y, but a regular contraction process leading to V-deletion makes geminination applicable again.)
<table>
<thead>
<tr>
<th>ID</th>
<th>Fusion Type</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Isolating</td>
<td>The formative is a free phonological word. If it is, it is likely to be written as a separate word, though this is not always true: non-isolating formatives like clitics are often written as separate words, and isolating formatives are written with hyphens or clitic boundary markers. Therefore the formative is a clitic or segmentable affix. Word-level phonological processes (such as vowel harmony), word-internal kinds of sandhi, prosodic phenomena (such as word stress) or general inability to stand alone, identify a formative as concatenative.</td>
</tr>
<tr>
<td>2</td>
<td>Concatenative</td>
<td>No longer used. Instead, use the more specific type of nonconcatenative marking (Fusion ID #5). See log #40.</td>
</tr>
<tr>
<td>3</td>
<td>Nonconcatenative</td>
<td>No longer used. Instead, use the more specific type of nonconcatenative marking (Fusion ID #5). See log #40.</td>
</tr>
<tr>
<td>4</td>
<td>n/a</td>
<td>don’t know</td>
</tr>
<tr>
<td>5</td>
<td>Isol/concat</td>
<td>Isolating wrt stress, concatenative wrt segmental rules -- or vice versa.</td>
</tr>
<tr>
<td>6</td>
<td>Reduplication</td>
<td>Concatenative formative plus reduplication (usually reduplication of stem). If some nouns take just the affix and others take the affix plus the reduplication, choose this entry (#8) from this menu and code for lexeme-based formative flexibility. (The flexibility lies in whether they do or don’t.)</td>
</tr>
<tr>
<td>7</td>
<td>Tone changes</td>
<td>Not sandhi but true internal tone changes.</td>
</tr>
<tr>
<td>8</td>
<td>Concat + redupl</td>
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<td>Concat + ablaut</td>
<td>Concatenative formative plus ablaut (usually stem ablaut).</td>
</tr>
<tr>
<td>11</td>
<td>Concat / ablaut</td>
<td>Concatenative formative or ablaut, neither one clearly primary (or both equally primary).</td>
</tr>
<tr>
<td>12</td>
<td>Replacive</td>
<td>The formative replaces a stem (or theme or base) segment. This is different from regularly concatenative formatives which alternate with other formatives, and not with stem segments. Example: Ingush agreement prefixes replace stem consonants (which are not themselves)</td>
</tr>
<tr>
<td>Category</td>
<td>Value</td>
<td></td>
</tr>
<tr>
<td>---------------------------</td>
<td>---------------------</td>
<td></td>
</tr>
<tr>
<td>Morpheme Type</td>
<td>1 Formative</td>
<td></td>
</tr>
<tr>
<td>Fusion</td>
<td>12 Reflexive</td>
<td></td>
</tr>
<tr>
<td>Stem Flexivity</td>
<td>0 none</td>
<td></td>
</tr>
<tr>
<td>Fmtve Flexivity</td>
<td>2 lex-based</td>
<td></td>
</tr>
<tr>
<td>Position</td>
<td>3 post</td>
<td></td>
</tr>
<tr>
<td>Construction-specific</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavior</td>
<td>2 spreading</td>
<td></td>
</tr>
<tr>
<td>Construction-specific</td>
<td>Adjuncts agree in number</td>
<td></td>
</tr>
<tr>
<td>Source of Marking</td>
<td>1 assign</td>
<td></td>
</tr>
<tr>
<td>Host restrictions</td>
<td>34 fl-animal</td>
<td></td>
</tr>
<tr>
<td>Exonence</td>
<td>1 cpn, covering: 2 Number</td>
<td></td>
</tr>
<tr>
<td>Roles covered</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marginally covered</td>
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<td></td>
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<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>Description and general comments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plural can cooccur with associative (= possessive) agreement (35).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ID</td>
<td>Fusion Type</td>
<td>Definition</td>
</tr>
<tr>
<td>----</td>
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</tr>
<tr>
<td>3</td>
<td>Nonconcatenative</td>
<td>No longer used. Instead, use the more specific type of nonconcatenative marking (Fusion ID #58). See log #40</td>
</tr>
<tr>
<td>0</td>
<td>n/a</td>
<td>don’t know</td>
</tr>
<tr>
<td>4</td>
<td>&lt;??&gt;</td>
<td>don’t know</td>
</tr>
<tr>
<td>5</td>
<td>Isol/concat</td>
<td>Isolating wrt stress, concatenative wrt segmental rules -- or vice versa</td>
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</tr>
<tr>
<td>12</td>
<td>Prosodic</td>
<td>Superimposition of a syllable or root template onto the stem, resulting in such processes as lengthening, gemination and the like. Example: Lango alienable possess marking, Semitic agreement and tense marking, etc.</td>
</tr>
</tbody>
</table>
Example 3: inflectional categories
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• Surveyed for formative exponence and synthesis
Example 3: inflectional categories

• Surveyed for formative exponence and synthesis
• No predefined list of what can show up
Example 3: inflectional categories

- Surveyed for formative exponence and synthesis
- No predefined list of what can show up

☞ Again, it is possible to discover new categories
Example 3: inflectional categories (cont’d)

|-----------|-----------|-------|---------|---------|-----------------------------|

**Synthesis degree of maximally inflected and maximally quasi-inflected verb forms:**

- Max. number of categories in sequence: 6
- Index = 11
- Bipartite stem? No
- Number of formative slots: 5

**Regular or inflectional incorporation or lexical extension?**

- Pros. coherent? 0 — how? External sandhi shifting word boundaries cutting across the grammatical word. Noonan p. 36, 42
- Phon. coherent? 0 — how? see above
- Synt. coherent? 1 — how?

**Inflectional categories marked in sequence:**

<table>
<thead>
<tr>
<th>Roles:</th>
<th>Role positions:</th>
<th>Others:</th>
<th>Cat. positions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 A</td>
<td>31 Construct</td>
<td>4 TAM</td>
<td>12 Diathesis</td>
</tr>
<tr>
<td>29 U</td>
<td>51 Deixis</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Search Roles**

**Search Categories**

**Notes:**

Diathesis is middle voice (reciprocal, reflexives, and affected-8 senses).
Benefactive and middle are judged inflectional because of paradigm interaction with the subjunctive mood (formative deletion in the middle voice; p. 99, 102). Ventives (=Deixis) have a different agreement paradigm and block benefactives (p. 100), hence inflectional. (1 slot for benefactives and ventives together.)
Agreement and TAM are one slot.

**References:** Noonan
Example 3: inflectional categories (cont’d)

S eynt hesis degree of maximally inflected and maximally quasi-inflected verb forms:

Max. number of categories in sequence: 6
Number of formative slots: 5

Regular or inflectional incorporation or lexical extension? 0 — of what? 0 0 0

Pros. coherent? 0 — how? External sandhi shifting word boundaries cutting across the grammatical word. Noonan p. 36, 42
Phon. coherent? 0 — how? see above
Synt. coherent? 1 — how?

Inflectional categories marked in sequence:

Roles: Others:

1 31 Construct
29

12 Diathesis
1

51 Devis

Notes: Diathesis is middle voice (reciprocal, reflexives, and affected-S senses). Benefactive and middle are judged inflectional because of paradigm interaction with the subjunctive mood (formative deletion in the middle voice; p. 99, 102). Ventives (=Devis) have a different agreement paradigm and block benefactives (p. 100), hence inflectional. (1 slot for benefactives and ventives together.) Agreement and TAM are one slot.

References: Noonan

morph_cat.def
Example 3: inflectional categories (cont’d)

<table>
<thead>
<tr>
<th>ID</th>
<th>Category</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>Focus</td>
<td>intensifiers, emphatics etc.</td>
</tr>
<tr>
<td>26</td>
<td>Valence</td>
<td>Transitivity markers. Does not include diathetical markers whose primary function is to change valence. Valence markers as defined here are generally used on ALL transitive or ALL intransitive verbs, whether derived or not (Example: Algonquian, Austronesian transitivity markers)</td>
</tr>
<tr>
<td>27</td>
<td>EVID</td>
<td>Evidentials, miratives, evaluatives etc.</td>
</tr>
<tr>
<td>29</td>
<td>Poss Class</td>
<td>Possessive declension class, i.e. declension class based on possessum-head</td>
</tr>
<tr>
<td>31</td>
<td>Construct</td>
<td>The formative does not express any category but rather indicates the use of a certain construction or the presence of a certain syntactic configuration. Examples: Arabic or Slave construct state marking</td>
</tr>
<tr>
<td>32</td>
<td>Poss Sem</td>
<td>Possession semantics</td>
</tr>
</tbody>
</table>
Example 3: inflectional categories (cont’d)

Lango: type #31 verbal construct forms with overt pronominal or relativized subject NPs

a. én òcámò.
   s/he 3SG.eat.PFV.CONSTRUCT
   ‘He ate it.’

b. òcàmmò.
   3SG.eat.PFV
   ‘He ate it.’

c. ácàmmò.
   3SG.eat.PROGR
   ‘He is eating it.’

(examples from Noonan 1992:137)
Example 3: inflectional categories (cont’d)

another example of a type #31 verbal construct form

Supyire (Gur): intransitive prefix on verbs after tense/aspect formatives iff these formatives immediately precede the verb.

a. mìì ná ìmpà ta.
   I PAST sheep get
   ‘I got a sheep’

b. mpà mìì ná ñ-tá
   sheep I PAST CONSTR-get
   ‘It’s a sheep I got.’

(examples from Carlson 1994: 127)
Example 3: inflectional categories (cont’d)

#31 verbal construct forms also found in:
Example 3: inflectional categories (cont’d)

#31 verbal construct forms also found in:

• Hausa (Chadic: Afroasiatic)
Example 3: inflectional categories (cont’d)

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only 7 out of 141 languages surveyed for synthesis
Interim summary

Autotypologizing databases
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Autotypologizing databases

• systematically provide for the discovery of new types
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- systematically provide for the discovery of new types
- contain crosslinguistically viable and precise definitions
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• are ready to receive input from fieldwork

Disadvantage of autotypologizing databases:
• they slow down data collection (in the beginning)
Using AUTOTYP modules in surveys
Using AUTOTYP modules in surveys

Common problem: heterogenous paradigms
Using AUTOTYP modules in surveys

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Example: Survey of TAM coexponents
Using AUTOTYP modules in surveys

Common problem: heterogenous paradigms

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Lango: verbal construct marking only with the perfective, not with other TAM forms
Using AUTOTYP modules in surveys

Common problem: heterogenous paradigms

Example: Survey of TAM coexponents

Lango: verbal construct marking only with the perfective, not with other TAM forms

<table>
<thead>
<tr>
<th></th>
<th>Perfective</th>
<th>Progressive</th>
<th>Imperfective</th>
</tr>
</thead>
<tbody>
<tr>
<td>3SG</td>
<td>òcàmò</td>
<td>àcàmmò</td>
<td>cámô</td>
</tr>
<tr>
<td>3SG.CONSTR</td>
<td>òcámò</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Noonan 1992: 136)
Using AUTOTYP modules in surveys (cont’d)

Solution: Exemplar-based Method
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Exemplar definition of TAM:

“If any of the TAM markers differs from others in their morphological behavior (here: exponence), pick TENSE; within TENSES, pick PAST (or whatever is chiefly used for simple, independent, past time reference); if there is none, pick FUTURE. If there is no TENSE, pick the closest ASPECT equivalent of past tense (e.g. perfective aspect). If there is no ASPECT, pick that MOOD, STATUS, or EVIDENTIALITY marker that is mostly used for past time reference (e.g. realis status).”
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Form: Tonal inflection plus agreement marker selection

Comments:

Morpheme Type: Formative
Fusion: Tone changes
Stem Flexivity: U none
Fmtve Flexivity: 0 none
Locus: 0 n/a
Construction-specific?
Position: 0 n/a
Construction-specific?
Behavior: 6 on head
Construction specific?
Source of Marking: 1 assign
Host restrictions: 1 V

Eponence: 4 cpm, covering: 4 TAM 31 Construct 5 Role 1 Person 2 Number
Roles covered:

Marginally covered:

TAM values covered:

Defines syntactic constraint:

Description and general comments:
Two forms: one for relativized subjects (p217f, 137f) and the pronominal subject 'en'; one for all other contexts. This constructional category is not found with the progressive and the habitual aspects. The perfective -- along with the habitual and subjunctive -- takes one set of agreement prefixes; the progressive takes another set.

Examples:

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Compiler: BB 3-17-2001
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Construction specific?
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Host restrictions: 1 V

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Examples:

Sources: Noonan
Compiler: BB 3-17-2001
Survey Example 1: TAM exponence

\[(N = 149 \text{ from Gen1 sample})\]
Survey Example 1: TAM exponence (cont’d)

Results:
Survey Example 1: TAM exponence *(cont’d)*

Results:

• No evidence for large-scale arealities.
Survey Example 1: TAM exponent (cont’d)

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  (TAM+AGR± tested in 4 macro-areas: $\chi^2 (3, 149) = 1.20, p = .99$)
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Survey Example 1: TAM exponence (cont’d)

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  ➢ *H*: Songhai and Nilotic? (Nilosaharan?)
Survey Example 2: Synthesis
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Exemplar definition:
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• maximum $N$ (categories) on verb
Survey Example 2: Synthesis

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• inflectional categories only (i.e., sensitive to the syntactic environment or interacting with morphological paradigm and allomorphy choices, such as negation interacting with tense or agreement)
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- verb categories only (i.e., no trans-category clitics such as Turkish interrogatives)
- synthetic categories only (i.e., no auxiliaries like Finnish negation markers)
- phonologically bound (negation in Turkish) or free (negation in Hmong)
Survey Example 2: Synthesis (cont’d)

Synthesis Index:

\[ SYN = N_{max} \text{ (categories)} + N_{max} \text{ (formatives)} \]
Survey Example 2: Synthesis (cont’d)

(N = 136 from Gen1 sample)
Survey Example 2: Synthesis (cont’d)

Results:

• Subcontinent-sized areality.
  (Kruskal-Wallis $\chi^2 (9, 136) = 29.80, p < .001$)

• Himalayan and Caucasian enclaves in Eurasia.
  (Mann-Whitney $U (1, 42) = 89.00, p = .036$)

• Enclaves have the same profile as Circum-Pacific populations (“Ancient Sunda” population).
  (Mann-Whitney $U (1, 99) = 402.50, p = .621$)
Survey Example 2: Synthesis (cont’d)

(N = 136 from Gen1 sample)
Survey Example 2: Synthesis (cont’d)

- *Hypothesis:* Enclaves preserve the typological profile of Eurasia at the time of early American colonization(s), i.e., before the great spreads in Eurasia (SEA, Silk Road) changed this profile.
Conclusions

- The **Autotypologizing Method** develops analytical notions that are guaranteed to be crosslinguistically viable and that directly feed into field research, quantitative typology, and theoretical linguistics.

- The **Exemplar-Based Method** allows for systematic assessment and statistical analysis of typological profiles.
Credits

- The research group
  - Johanna Nichols (Co-Director, Berkeley)
  - Balthasar Bickel (Co-Director, Leipzig)
  - Fernando Zúñiga (Post-Doc, Leipzig)
  - Sandra Biewald (RA, Leipzig)
  - Aimee Lahaussois-Bartosik (RA, Berkeley, until Spring 2002)
  - Michael Riessler (RA, Leipzig)
  - Suzanne Wilhite (RA, Berkeley)
  - Alena Witzlack-Makerevich (RA, Leipzig)

- Swiss NSF Grant Nos. 08210-053455 and 610-0627 (Bickel);
  US NSF Grant No. 96-16448 (Nichols)