Non-actual motion (NAM) expressions

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Motion in Language and Experience: Actual and Non-actual motion in Swedish, French and Thai. Part I.

Johan Blomberg
What is motion?

- well known term until we have to describe it
- multifaceted phenomenon in both language and experience

“language is structured the way it is because of our natural ability to simulate motion” (Matlock)
Types of motion in language:

- inner motion [movement] (the activity involved in motion) *run, walk*
- outer motion [displacement] (how somebody or something changes its location in space)
- lived motion (first-person perspective of motion)
  - observed motion (third-person perspective)
- actual motion
  - non-actual motion
### Two types of motion expressions:

<table>
<thead>
<tr>
<th></th>
<th><strong>V-framed</strong> languages</th>
<th><strong>S-framed</strong> languages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Path</strong></td>
<td>in the main verb</td>
<td>an optional component of the sentence</td>
</tr>
<tr>
<td><strong>Manner</strong></td>
<td>an optional component of the sentence</td>
<td>in the main verb</td>
</tr>
<tr>
<td><strong>Scene descriptions</strong></td>
<td>More static</td>
<td>More dynamic</td>
</tr>
<tr>
<td><strong>Similar ways of movement</strong></td>
<td>Expressed by different verbs</td>
<td></td>
</tr>
<tr>
<td><strong>Languages</strong></td>
<td>French, Spanish</td>
<td>English, German, Swedish</td>
</tr>
</tbody>
</table>
The expression of non-actual motion in Swedish, French and Thai

Johan Blomberg
Terms describing NAM

- *virtual motion* or *fictive motion* (Talmy)
- *abstract motion* (Matlock 2010)
- *subjective motion* (Langacker, Matlock)

This terms have different scopes, but often are used as synonyms. Blomberg proposed term *non-actual motion (NAM)*
NAM definitions

- “[...]refers to certain dynamic qualities of intentional acts that can be seen as motivating the use of sentences with motion semantics to denote static situations. [...] we use this as a cover term for all sentences in which (minimally) a motion verb is used to denote a situation that lacks observed motion.” (Blomberg & Zlatev)

- “A sentence that by substituting the expression of the spatially extended object (typically expressed by the grammatical subject) with one that denotes an entity that can move by its own volition, actual motion would be the only possible interpretation.” (Blomberg, chapter 3.4)

- Simplified definition:
NAM is used to describe motion which is not present. By replacing the object that is able to move by object that is not, we create NAM sentence.
Motivations of NAM

- the capacity for self-motion connected to affordances for motion
  - Related to way we perceive - detection of affordances for motion.
- visual scanning
  - “dynamicity in the very act of experiencing. The act of “building up to a full conception” (Langacker)”
- the imagination of movement
  - “processes are supported by the by the same processes that are used for physical interaction, that is, for perception and action”
Method

- concerning on spatially extended objects that afford motion and those that do not (Objects either afforded human movement or not)
- “cognitive bias towards dynamism” and “visual scanning”. (the same spatial situation with perspectival alterations: first or third-person)
<table>
<thead>
<tr>
<th>Afford</th>
<th>Non-afford</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>first-person</strong></td>
<td></td>
</tr>
<tr>
<td><img src="image1" alt="Bridge" /></td>
<td><img src="image2" alt="Fence" /></td>
</tr>
<tr>
<td><strong>third-person</strong></td>
<td></td>
</tr>
<tr>
<td><img src="image3" alt="Bridge" /></td>
<td><img src="image4" alt="Fence" /></td>
</tr>
</tbody>
</table>
Participants and procedure

- 16 speakers of Swedish (8 female)
  14 speakers of Thai (10 female)
  13 speakers of French (11 female)
- They were shown 38 pictures (24 target, 12 controls and 2 practice) in three different viewing orders. Instruction was given in native language of participant.

Task: Look at each picture and describe what you see in one sentence without referring to previously seen pictures.
Non-actual motion in Swedish

Table 3. The different verbs used by the Swedish participants

<table>
<thead>
<tr>
<th>Manner</th>
<th>Path</th>
<th>Direction</th>
<th>Cause</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>flyta ('float')</td>
<td>sluta ('end')</td>
<td>komma ('come')</td>
<td>leda ('lead')</td>
<td>sticka ('stretch')</td>
<td></td>
</tr>
<tr>
<td>gå ('go')</td>
<td>försvinna ('disappear')</td>
<td>binda ('bind')</td>
<td>fortsätta ('continue')</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Non-actual motion in Swedish

- Research focused on - how the Figure as a spatially extended object was related to the spatial environment. This was conveyed in two ways:

1. use of change-of-state verbs not restricted to motion and Path + Direction prepositions and/or adverbs.
   Sentences that falls under this point are NAM-sentences.

2. use of complex NP's only with prepositions and adverbs expressing Path and/or Direction
   Sentences that falls under this point are NAP (Non-actual Path) - semantic siblings to NAM.
Non-actual motion in French

Un petit chemin qui mène à la porte. - A small path that leads to the door.
Une route qui passe sous un tunnel. - A road that passes under a tunnel.
Là c’est en sortant de un tunnel. - Here we are leaving a tunnel.
Non-actual motion in French

Une route qui se dirige vers une forêt. - A road that heads toward a forest.
Cette belle conduite qui semble pénétrer sous ces roches. – This pretty pipe that seems to penetrate under those rocks.

There is **ambiguity in the motivation of NAM-sentences**: either the function of transporting water or the spatial configuration of a pipe. Considering **multi-faceted nature of NAM-sentences**, we can expect both.
NAM in Thai

Table 5. The different verbs used by the Thai participants

<table>
<thead>
<tr>
<th>Manner</th>
<th>Path</th>
<th>Direction</th>
<th>Cause</th>
<th>Manner+Path</th>
<th>Other</th>
<th>Total</th>
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<tr>
<td>doen</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>22</td>
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<tr>
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<td>phung</td>
<td>5</td>
<td></td>
<td></td>
<td>chò</td>
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<tr>
<td>'dash'</td>
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<td></td>
<td></td>
<td>'peirce'</td>
<td></td>
<td></td>
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<tr>
<td>wing</td>
<td></td>
<td></td>
<td></td>
<td>lôt</td>
<td></td>
<td></td>
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<tr>
<td>'run'</td>
<td></td>
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<td></td>
<td>'penetrate'</td>
<td></td>
<td></td>
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<tr>
<td>'cross'</td>
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<td>oök</td>
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<td>rät</td>
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<tr>
<td>'exit'</td>
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<tr>
<td>phaan</td>
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<td>thalú</td>
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<tr>
<td>'pass'</td>
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<tr>
<td>thu 'eng</td>
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<td>thot</td>
<td></td>
<td></td>
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<tr>
<td>'reach'</td>
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</tbody>
</table>

Thai - equipollently-framed language with (SVC).

Phuỳing phaa dek pai rohngriian. - The woman leads the child to school.
Non-actual motion in Thai

The Thai speakers used all three types of motion-verbs were used in expressing NAM: Path and Direction-verbs independently or together, as well as Manner-verbs.

The Region-changing verbs *khâw* (‘enter’) and *oòk* (‘exit’) were used in contexts where the figure did not “enter” or “exit” a landmark. This suggests that the verbs are bleached even in the context of NAM-sentences.

\[ \text{Thangdoen } \text{*khâw* } \text{pai } \text{nai } \text{umong}. \] - A path enters goes inside a cave.
\[ \text{Thàññon } \text{*oòk* } \text{ma } \text{chaàk } \text{umong}. \] - A road comes out of a cave.

Deictic verb *pai* (“go”) is dependent on the conceptualization speaker motivated by the experience of NAM and dependent on language conventions

\[ \text{Mi thangdoen } \text{*pai* } \text{nai } \text{umong}. \] - A path goes inside a mountain.
Non-actual motion in Thai

Thai speakers used *ma* ("come") was limited to entities stimulus of 1 pp extensions spatially located partially outside and partially inside the unit of reference.

*Pen tho yao toò kan oòk ma chaàk umong.* - A long pipe continues out from a cave.

Another tendency used only be the Thai-speakers was Manner-verbs in NAM-sentences. Dependent on whether the Figure was associated with fast or slow travel, the Thai speakers marked this difference with Manner-verbs expressing different velocities of human translocation.

*Mi thang léklék doen khâw pai.* - A small road goes (in)to [a house].

*Thàn ̌ on sen nuèng sueng wîng khâw pai bon phukha ̌ o.* - A long road that runs away into a mountain.

*Mi thàñon phûng khâw su thang.* - A road dashes into a way.
The expression of non-actual motion in Swedish, French and Thai - conclusions:

- The three motivations were affordance for motion as directly connected to self-motion, scanning and imagination of motion. These were used to design stimuli for cross-linguistic investigations. Through an elicitation-based study on Swedish, French and Thai, it was found that speakers of all three languages use NAM-expressions prolifically.

- Even though the three different languages groups behaved similarly, a semantic analysis of NAM expressions showed that the resources for expressing actual motion were retained.
Abstract motion is no longer abstract

Tennie Matlock
Abstract motion is no longer abstract

- Structure descriptions of static scenes such as ‘The mountain range goes from Mexico to Canada’, and in doing so, invokes a subjective sense of motion or state change.
- In everyday conversation, people routinely use language about motion to describe static situations. Perplexing as it may seem, this is common practice when people are describing stationary spatial layouts.
- These constructions are ubiquitous in many languages, including English, Finnish, Japanese, Thai, Spanish, and Hindi (for example and discussion, see Huumo 2005; Matsumoto 1996; Rojo and Valenzuela 2003).
Abstract motion is no longer abstract ...

- Ronald Langacker and Leonard Talmy in particular argued that these constructions invoked an implicit, fleeting sense of motion even though no motion was explicitly expressed.
- Langacker called it abstract motion (Langacker 1986), and Talmy referred to it as fictive motion (Talmy 1996). Yo Matsumoto called this fleeting sense of motion subjective motion to emphasize its subjective nature (see Matsumoto 1996).
Matlock, T., M. Ramscar & M. Srinivasan Research

- How direction of numbers affect temporal reasoning?

- The “move forward time question: „Next Wednesday's meeting has been moved forward two days. What day is the meeting now that it has been rescheduled?”

- **Friday and Monday** responses:
  - Filling gaps towards, people were more likely (75%) to answer “Friday” than if they were filling backwards (41%).

- Simple thinking about direction of objects was enough for taking an ego-moving perspective.
Eye motion studies results

- People spent more time viewing the region of the scene that containing relevant trajectories while they were processing sentences with abstract motion.
- Listening also to the information about clutter of environment before seeing drawings, they looked longer at the trajectories when they listened to information about a cluttered terrain.

“The results of these eye-tracking experiments suggest that abstract motion in language is capable of causing mental simulation of physical movement along a trajectories even though objectively no motion takes place in the scene.”
Visual scan paths and temporal reasoning

- People read one of three sentences varying from visual path:
  - I can see Fred across the table. (short visual path)
  - I can see Fred across the room. (medium visual path)
  - I can see Fred across the field. (long visual path).
- Answer the question about Wednesday’s meeting moved forward two days.
Visual scan paths and temporal reasoning

- Results
  - short visual path (138 participants): 53% - Friday vs 47% Monday
  - medium visual path (137): 64% - Friday vs 36% - Monday
  - long visual path (154): 66% - Friday vs 34% - Monday

“[…] visual paths influence the conceptualization of time […] because of […] increasing[…] Friday responses.” (about 13%)
Experiment: Aspect and spatial distribution

- Imperfective aspect and perfective aspect are processed differently?
- Over 200 participants read sentences with different aspects:
  - imperfective (Bob was planting pine trees along his driveway last week.)
  - perfective (Bob planted pine trees along his driveway last week)
And were asked to estimate the length of the driveway.
- Driveway length was grouped into short, medium and long scores.
- Results:
  - In perfective description: 33% short, 32% medium, 34% long
  - In imperfective description: 20% short, 31% medium, 49% long

Imperfective aspect leads people to think farther in time and space.
Activation in Human MT/MST by Static Images with Implied Motion

Zoe Kourtzi and Nancy Kanwisher
Massachusetts Institute of Technology
Activation in Human MT/MST by Static Images with Implied Motion

- Recent imaging studies - MT/MST is involved not only in the analysis of the continuous coherent motion of a physical stimulus, but also in the processing of apparent motion, illusory motion and imagined motion.

- Check if MT/MST are also involved in processing implied motion from static images.
Activation in Human MT/MST by Static Images with Implied Motion

The green circles indicate regions activated significantly for both moving rings and images with implied motion.
Examples of images and results

PSC in MT/MST was significantly greater for images of athlete with implied motion than for athlete without motion, man at rest and house.
When participants viewed images with animals implied motion (AIM) the activation of MT/MST area was greater than in other cases.
Conclusions

- Stronger functional magnetic resonance imaging (fMRI) activation with MT/MST during observation of photographs with implied motion compared to observation of photographs without implied motion.

- Brain regions involved in visual analysis of motion are also engaged in processing implied dynamic information from images.
NAM sentences in Polish - our study

We agreed that also in Polish people are using NAM sentences. But we were curious when people will use those sentences to describe pictures.

- What in our opinion might affect use of NAM sentences:
  - Details presented (photo vs drawing, details on each picture)
  - Length of expression (using just one sentence might enforce NAM)
  - Presence of actual motion (road with car and without)
  - Perspective (first vs third-person perspective)
Our methods

Using Google Forms, we’ve created 4 forms with 4 pictures in each form. We asked people just only one question (with previous calming down we are not going to judge their answers):

- “In simple, natural for you language describe the picture”
  (Polish: W prostym, naturalnym dla Ciebie języku opisz obrazek)
- We divided pictures into:
  - First-person perspective, few details
  - First-person perspective, more details
  - Third-person perspective
  - Actual motion (without significant role of details or perspective)
Our methods

- Participants filled just only one from four sets.
- There was no criteria like sex, age or field of study (we tried to avoid people which had classes in semiotics).
- We used the same definition of NAM as used by Blomberg and we looked for any use of NAM in answer.
- We excluded:
  - one word answer, (ex. fence)
  - no relation between answer and the picture, (ex. rhubarb)
  - answer that could be name of the pictures rather than description
- After all we received 58 answers
Is there any motion?

<table>
<thead>
<tr>
<th></th>
<th>First form</th>
<th>Second form</th>
<th>Third form</th>
<th>Fourth form</th>
<th>Sum</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examined</td>
<td>21</td>
<td>8</td>
<td>15</td>
<td>14</td>
<td>58</td>
<td>14,5</td>
</tr>
<tr>
<td>Uses of NAM</td>
<td>20</td>
<td>5</td>
<td>14</td>
<td>12</td>
<td>37</td>
<td>9,25</td>
</tr>
</tbody>
</table>
The role of perspective

<table>
<thead>
<tr>
<th>Perspective Type</th>
<th>NAM Sentence</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>All forms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st person (no much details)</td>
<td>15</td>
<td>26%</td>
</tr>
<tr>
<td>1st person with actual motion</td>
<td>4 NAM 25 AM</td>
<td>7% 43%</td>
</tr>
<tr>
<td>1st person (many details)</td>
<td>18</td>
<td>31%</td>
</tr>
<tr>
<td>3rd person</td>
<td>8</td>
<td>14%</td>
</tr>
</tbody>
</table>
Example of ours pictures
Differences between our and Blomberg research

● Our examination wasn’t methodologically correct, and relations we found couldn’t be recognized as science facts, but we have some conclusions.

● Blomberg made his participants describe picture in one sentence, we didn’t restrict ours this way, exception form 4. Surprisingly, in this one motion sentences were most popular.

● Pictures chose by us were mostly in colour, whereas Blomberg’s were black and white. It worked that, our participants more often focused on they feeling about picture and mood in it.
The role of details

● We thought details would disturb people for using NAM. Surprisingly, pictures which we categorised as "picture with more details" had more uses of NAM than that with lack of them.

● Usually more detailed pictures were photos. Probably they are more dynamic than drawings, so they naturally force use of NAM.
Human factor

- Amount of NAM sentences depend also on people who take part in test. A few people used them in all pictures, whereas another didn’t use it once.

- It didn’t depend on length but people who used “richer” language in description, used NAM more often.
Bibliography
