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TIME IN SPACE

Lera Boroditsky, Alice Gaby & Stephen C. Levinson

Project Categories and concepts across language and cognition

Task There are two aspects of this project:

1. Time arrangement tasks: There are two non-linguistic tasks to assess the way people arrange time either as temporal progressions expressed in picture cards or done using small tokens or points in space to represent points in time. These non-linguistic tasks should be repeated with multiple participants as explained below. Responses are to be noted down on coding sheets and photographed and/or videotaped.

For each participant in the non-linguistic tasks, there are two sittings. In sitting 1, sit the participant facing in a particular direction and run the first four picture sets of card-arranging and the questions specified for the first sitting of the time-points task. Then for sitting 2 re-orient the participant to face a different direction (180 degrees different) and run the other four picture sets of card-arranging followed by the questions specified for the second sitting of time-points. Once these tasks are completed, the participant should be asked the background and spatial knowledge questions on the final coding sheet.

2. Time & space language inventory: There is a time-language & knowledge inventory (at the end of this field manual entry) which is intended to discover and document the linguistic coding of time and its relation to space, as well as the cultural knowledge structures related to time. This inventory should be filled out to the best of the researcher's knowledge and confirmed with consultants as much as possible.

Goal of task To investigate how people conceptualise time, particularly wrt spatial reference frames, literacy and other cultural factors.

Prerequisites You will require (i) stimulus cards, (ii) poker chips, pebbles or some similar tokens (see below), (iii) coding sheets, (iv) a compass.

Background[8]

How do different languages and cultures conceptualise time? This question is part of a broader set of questions about how humans come to represent and reason about abstract entities – things we cannot see or touch. For example, how do we come to represent and reason about abstract domains like justice, ideas, kinship, morality, or politics? One possible explanation is to appeal to metaphor, the idea that abstract domains are understood through analogical extensions from more experience-based domains (e.g., Boroditsky 2000, Gibbs 1994, Lakoff & Johnson 1980).

[8] This is a reprint (with minor modifications) from the Language & Cognition Group Field Manual 2007, edited by Asifa Majid.

One of the better-studied examples of such analogical extension is of spatial representations being reused for structuring the more abstract aspects of time. Across cultures, people use spatial representations for time, for example in graphs, time-lines, clocks, sundials, hourglasses, and calendars. In language, time is also heavily related to space, with spatial terms often used to describe the order and duration of events (Clark 1973, Fillmore 1997, Lakoff & Johnson 1980, Traugott 1978). In English, for example, we might move a meeting *forward*, push a deadline *back*, attend a *long* concert or go on a *short* break. Further, people make consistent spatial gestures when talking about time (e.g., Casasanto & Lozano 2006, Núñez & Sweetser 2006), with English speakers for example gesturing to the left when speaking about the past and to the right when speaking about the future. This left-to-right order in English speakers appears to be created by writing direction. Arabic speakers, who read from right to left, gesture from right to left for the passage of time.

People also appear to spontaneously invoke spatial representations when processing temporal language (e.g., Boroditsky 2000 Boroditsky & Ramscar 2002), such that priming different spatial perspectives will change the way people interpret and process statements about time. People's understanding of time appears so intimately dependent on space, that when people engage in real-life spatial activities such as making an air journey or waiting in a lunch-line, they also unwittingly (and dramatically) change their thinking about time (Boroditsky & Ramscar, 2002). Even simple temporal judgments, like being able to reproduce short durations, are affected by spatial information (e.g., Casasanto & Boroditsky 2007).

If it is the case that people build representations of time out of representations of space, then it follows that people who use different spatial representations should also think differently about time. This project aims to compare groups who use different spatial frames of reference (Levinson 2003), have different amounts of exposure to writing systems, and vary on other cultural dimensions, in how they think about time. For example, if English speakers think of time as proceeding from left to right, what will happen in a language group that does not use words like left and right?

One study we conducted with the Kuuk Thaayorre, an Australian Aboriginal group, has yielded suggestive results. The Kuuk Thaayorre predominantly rely on an absolute spatial frame of reference (roughly aligned with North, South, East, and West). When asked to perform the temporal ordering tasks described in this field manual entry, English speakers laid out time as proceeding from left to right. The Kuuk Thaayorre laid out time as proceeding from East to West (Boroditsky & Gaby 2006). Does the East-to-West arrangement of time occur in all absolute-spatial-reference frame cultures? What happens if the absolute spatial reference frame is not similar to N/S/E/W? What happens in illiterate populations who use relative spatial reference frames? These studies aim to discern the contributions of spatial language, language used to describe time, writing systems, and other cultural factors on how people come to conceptualise the domain of time.

Research questions
How do different languages and cultures conceptualise time? Does the way people talk about and conceptualise space affect the way they think about time? In particular, what impact does the dominant spatial frame of reference (e.g., absolute, intrinsic, relative) in language have on how people conceptualise the passage of time?

1. TIME ARRANGEMENT TASKS

Consultants

We are interested in data from any number of participants. Ideally at least 9 people should be tested, but smaller numbers will still be useful. Obviously the numbers depend on how consistent the data are from participant to participant. The only requirement for participants is that they be fluent speakers of the language they represent. Details of the participant's age, education, and fluency in other languages should be recorded on the background questionnaire. In communities where some members are frequently exposed to or immersed in outside languages and/or formal/western educational systems, it would be of most interest to seek out those who are least exposed (in some cases this would be elders and/or pre-school children). While people who are least exposed to outside languages are of highest priority, members of the same community who have more contact with the outside provide an important internal comparison, so should be included as well.

Equipment

You will require:

(1) set of picture cards
(2) 3 tokens of some sort (poker chips, pebbles, marbles, etc)
(3) coding/data sheets
(4) a compass

Setting

Ideally the participant would be seated on the ground, outside, with large flat area available in front of them on which to arrange the cards. The researcher should sit directly next to the participant, facing in the same direction.

If the participant is sitting on a blanket or rug for example, make sure there are no patterns on it that would prejudice a particular spatial organisation.

If it's not possible to sit on the ground and/or outside, try to find a large – ideally circular – table with plenty of free room and no obvious orientation markers (e.g., lines, patterns, other objects on it).

Procedure

Video and audio record your sessions. You will also need to take still photographs during the procedure.

For each participant, we strongly recommend the following order of events:

1. Sitting 1
    a. Card-arranging task, sitting 1
    b. Time-points task, sitting 1
2. Rotate the participant 180 degrees
3. Sitting 2
    a. Card-arranging task, sitting 2
    b. Time-points task, sitting 2
4. Background questions and spatial knowledge test

The first and second sittings could take place on different days if this feels more natural. It is crucial that the researcher records the compass bearings for each of the sittings.

Card arranging task

Stimuli

Your kit contains 48 round laminated cards with photographs on them. The photographs comprise 12 sets of 4, each set showing a temporal progression of some sort (e.g. a chicken hatching from an egg, a person aging). Eight of the sets are the core sets for this experiment, and there are an additional 4 sets included in case one of the core sets proves inappropriate. The 8 core sets are named as follows:

banana:	a banana being peeled and eaten
chicken:	a chick hatching from a brown egg
Cosby:	Bill Cosby at different ages
puppy:	a growing black puppy at different ages
green apple:	a green apple being eaten
duck:	a duckling hatching from a white egg
grandpa:	Lera's grandfather at different ages
pregnant belly:	a woman's belly growing through pregnancy

In addition to the eight core sets of photographs (four for each sitting direction), there are a further four ancillary sets which may be substituted for core sets that prove offensive, uninterpretable or otherwise difficult in the field context. For instance, if it is culturally insensitive to show images of the pregnant woman's growing belly, this set of photographs may be replaced by the photographs of the growing Dalmatian puppy at the fieldworkers' discretion. If you need to make a substitution, try to preserve the general time-scale (for example, if the banana-eating set is unclear in your field context, replace it with the ancillary set that shows a similar time-scale – in this case the red apple set would be most similar). Where possible, however, we request that the core sets be used. The ancillary sets are named as follows:

red apple:	a red apple being eaten
frog:	a tadpole maturing into a frog
cracked egg:	an egg cracking and spilling out of the shell
Dalmatian:	spotted Dalmatian dog at different ages

A quick picture guide that includes all the core and ancillary sets is included with this packet.

Half of the eight core sets should be used in sitting 1, and half should be used in sitting 2. We have divided the sets into GROUP A and GROUP B. This grouping ensures that all time intervals are equally represented in the two sittings.

GROUP A (core): banana, chicken, Cosby, puppy
GROUP B (core): green apple, duck, grandpa, pregnant belly

Ideally for each participant you would randomly choose which group of pictures (A or B) will be used in each sitting. Within each sitting, you will then randomly choose the order in which to present the 4 sets in the group you have chosen.

Here is a quick guide to the terminology used in the instructions:

Cards: A card is an individual laminated photo. There are 48 cards total. 32 of these cards belong to the core picture sets. An additional 16 cards belong to the ancillary picture sets.

Sets: A set is a collection of 4 cards showing a temporal progression. For example, the 4 cards showing Bill Cosby at different ages are the Cosby set. There are 8 core sets, and 4 ancillary sets.

Groups: The 8 core sets of cards are divided into two Groups: A & B. The four sets that belong to Group A are: banana, chicken, Cosby, puppy. The four sets that belong to Group B are: green apple, duck, grandpa, pregnant belly. This grouping defines what sets are to be tested together in a sitting. All the sets in Group A should be tested together in one sitting and all the sets in Groups B should be tested together in the other sitting.

Procedure

SITTING 1

Step 1: Sit the participant facing in some direction, and note the direction precisely on the scoring sheet using the compass bearings. Draw an arrow indicating north in the circle provided on the scoring sheet. Be sure to vary the starting direction from participant to participant. Sit down next to the participant facing the same direction, or stand behind them. Note down if you are on the participant's right or left (or behind them).

Step 2: Randomly select whether you'll use the four sets from Group A or Group B for the first sitting.

Step 3: Randomly select one set of cards from the Group you have chosen, shuffle the cards in the set so they are out of order, and hand them to the participant.

Step 4: Ask the participant to look through the cards. When they have had a chance to look through the cards, ask them to arrange the cards on the ground "so that they are in the correct order", or to "put the cards down in the correct places on the ground so that we can see that one thing happens and then the

next and then the next", or to "lay these out on the ground so that they go in the correct order from the very earliest one to the latest one."

Step 5: Record the arrangement in which the participant lays out the cards on the coding sheets provided, preferably supplemented by video recording and/or still photographs. An example filled out coding sheet is provided with this packet. Be sure to note which set is being tested by writing the name of the set in the blank provided on the coding sheet. Then draw the arrangement created by the participant in the diagram provided in the coding sheet. This diagram shows a top view of a participant sitting. Use the numbers 1, 2, 3, and 4 to indicate which pictures were placed where by the participant, with 1 indicating the earliest picture of the set, and 4 indicating the latest time-point. The 1, 2, 3, 4 refer to the card order as it was intended (see the card numbers in the picture guide). If the participant believes that the order should be different, please include this in the notes. For example, if the participant believes that puppy3 is actually older than puppy4, and arranges them from left to right as 1 2 4 3, then the coding diagram should show 1 2 4 3, but then the notes should clarify that puppy3 was perceived as older than puppy4.

Step 6: Repeat steps 3-5 for the three remaining sets of pictures in the Group (A or B) you chose for this sitting.

SITTING 2

Step 1: Have the participant sit facing in a direction that is rotated 180 degrees from sitting 1. If 180 degrees is not possible or is awkward, any other rotation will still be informative (e.g., 90 degrees). Please note the participant's facing direction precisely on the scoring sheet using the compass bearings. Draw north in the circle provided on the scoring sheet.

Step 2: Select the Group of pictures that you did not use in sitting 1 (e.g., if you used Group B in sitting 1, then use Group A in sitting 2).

Steps 3-6: Same as for sitting 1.

For this task, it is important that the participant and researcher share the same perspective, so the participant does not adjust their orientation of the cards to present them to the researcher's viewpoint. For this reason, the researcher should be careful to sit next to – or stand behind – the participant as they are laying the cards out.

Ideally the photo sets should be presented in random order (within the prescribed groups), but if you find a particular set of cards works better than the others for explaining to the participants what is required of them, it is okay to always begin with the same set.

Ideally, too, the directions for the task should be given in the target language. If an alternative contact language is employed this must be noted on the coding sheets. The sample instructions provided in step 4 may serve as a basis for translation into the target/contact language. The exact instructions given to each participant should be noted down in the data sheets.

IT IS CRUCIAL THAT THE RESEARCHER *DOES NOT* LEAD THE PARTICIPANT TO ARRANGE THE CARDS IN A PARTICULAR CONFIGURATION (E.G. LINEARLY, LEFT-TO-RIGHT) THROUGH THEIR LANGUAGE, POINTS OR GESTURES. For example, make sure you don't accidentally make sweeping gestures across the ground when explaining the task, etc. We recommend that the researcher avoid pointing or gesturing altogether. Also, avoid all spatial language (e.g., words like ahead, behind, left, right, in front, back, north, south, east, west, etc).

If the participant is unsure which picture precedes which, it is fine to discuss with them the temporal order of the cards. For example, it is OK to say things like "these are all photos of the same dog, but one photo was taken when the dog was just a little puppy, then there's another photo when she's a bit older…" and so on. We are not so much interested in how they interpret the sequence of cards, but rather in how they express this sequence spatially. The researcher should therefore be vigilant against biasing the participant towards any particular spatial configuration.

If the participant simply lays down the cards on the ground randomly, ask them to tell you about what they see in the pictures and which things come first and which things come later. If the participant seems to understand the temporal order, ask them to pick the cards up again and lay them out on the ground so that they are in the correct order. Again, do not gesture or point or say anything that would suggest a particular spatial layout. We would like to capture what the participant thinks is the most natural arrangement, be it circular, diagonal, parabolic, or anything else.

IMPORTANT: Do not tell the participant that you are interested in what spatial arrangement they will make. You can tell them the study is about time, and we are interested in what they think of these pictures and what order they should be in. Do not mention that we are interested in the spatial arrangement. This is meant to be an implicit measurement. This is very important.

Time-points task

Stimuli

For this task, you will be presenting people with words that correspond to different time-points (e.g., yesterday, today, tomorrow) and asking them to point or place a token to mark where they would put those time-points in space, relative to one another. If possible, try doing this task by placing the reference time-points in the air in front of the participant, such that they can place time-points anywhere in 3-dimensional space around the initial marker you set. If this proves problematic for your participants, you can do the task in 2 dimensions, placing tokens (pebbles, poker chips or similar small round objects) on the ground (or a table), or by drawing dots in the sand.

Procedure

Step 1: Sit or stand next to the participant, so that you are both facing in the same direction. Note down the facing direction in the scoring packet using precise compass bearings. Draw an arrow pointing north. Note down if you are on the participant's right or left.

Step 2: If doing the 3D in the air version: Hold out a token directly in front of the participant around chest height, extended roughly a foot along the sagittal axis and ask "If I tell you that this here is today, where would you put yesterday? Can you put this token where yesterday would be?" Wait for the participant to point to a spot and then ask "And where would you put tomorrow?"

If doing the 2D on the ground version: Place a token directly in front of the participant on the ground (or table), extended roughly a foot along the sagittal axis. Ask "If I tell you that this here is today, where would you put yesterday? Can you put this token where yesterday would be?" Wait for the participant to place the token, and then ask "And where would you put tomorrow?" If seated on soft dirt or sand, you could alternatively draw a dot in the ground in front of the participant and have them draw dots in response to your question instead of using tokens.

Step 3: Record the placements of the time-points in the coding packet (see coding sheet). If necessary, draw diagrams (including the participant's body as a reference point and labelling the time-points '1', '2' and '3' in order of placement). Ideally, the arrangement should also be photographed or videotaped (including the participant in the frame as a reference point)

Step 4: Repeat steps 2-3 for all of the time-points listed in the scoring sheet for this sitting (also listed below), replacing the time-points of today, yesterday, tomorrow with nowadays, long ago, in the future, or this week, last week, next week, and so on as listed below and in the coding packet.

BE SURE TO ALWAYS PROVIDE THE MIDDLE TIME-POINT AS THE REFERENCE, AND THEN ASK THE PARTICIPANT ABOUT THE EARLIER AND LATER TIME-POINTS.

Time points to ask about in sitting 1:

1. This here is today. Where would you put yesterday? Where would you put tomorrow?
2. This here is nowadays. Where would you put long ago? Where would you put the future?
3. This here is this week. Where would you put last week? Where would you put next week?
4. This here is summer (or this season). Where would you put spring (or previous season)? Where would you put autumn (or next season)?
5. This here is midday. Where would you put morning? Where would you put evening?
6. This here is when you are sleeping. Where would you put it when you are just going to bed? Where would you put when you wake up from sleeping?

Time points to ask about in sitting 2:

1. This here is Wednesday. Where would you put Tuesday? Where would you put Thursday?
2. This here is the age you are now. Where would you put it when you were a baby? Where would you put it when you will be very old?

3. This here is this month. Where would you put last month? Where would you put next month?
4. This here is this year. Where would you put last year? Where would you next year?
5. This here is noon. Where would you put sunrise? Where would you put sunset?
6. This here is middle of the night. Where would you put dusk? Where would you put dawn?

The time-points listed here and in your data coding packets are a guide only. If they translate well and are not problematic, terrific! If they do not translate, they may be replaced by any culturally/linguistically appropriate triplets you can think of. Please note down the precise time points you used in each instance.

IMPORTANT
Before the participant moves from their initial orientation, you **must** take a compass bearing and record it on the coding sheet. Try to do this unobtrusively to avoid priming the participant to attend to cardinal directions more than they otherwise might.

Data collection
The above procedure should generate completed coding sheets at the very minimum. We also urge you to video-record the elicitation sessions. The card-arrangement task can alternatively be documented with a still camera, though this obviously provides less information.

Analysis
Statistical analysis of the data collected will be performed to identify trends both within and between populations. In order to correctly interpret these data, we will draw upon individual researchers' knowledge of the communities and languages concerned, and any observations you can make regarding time-space connections in gesture, art, metaphor or elsewhere will be extremely valuable. Please fill out the Time & Space language inventory section below to provide us with as much information as possible about the cultural treatment of time, and please keep your ears and eyes open and take note of anything else along these lines that might be of relevance.

2. TIME AND SPACE LANGUAGE INVENTORY:

1. Does the language have a set of terms for cardinal directions?

If yes, provide a brief description/list of terms: _____

How frequently are these used? _____
(e.g. in most utterances, in most conversations, daily, occasionally).

2. Does the language have a set of terms for intrinsic spatial relationships (e.g. *upriver*, *at the top of X*)?

If yes, provide a brief description/list of terms: _____

How frequently are these used? _____
(e.g. in most utterances, in most conversations, daily, occasionally).

3. Does the language have a set of terms that employ a relative frame of reference (e.g. *left/right*)?

If yes, provide a brief description/list of terms: _____

How frequently are these used? _____
(e.g. in most utterances, in most conversations, daily, occasionally).

4. If there is a writing system in common use in the community?

Describe origin and frequency of use:_____

What is the writing direction? (i.e. left→right, top→bottom, etc.): _____

5. Are any space/time metaphors lexicalised in the language for ordering events? For example, in English we use terms like ahead/forward/behind/back to talk about the order of events in time (the best is ahead of us, let's move the meeting forward, let's push the deadline back, I am running behind schedule, the show starts at the top of the hour, the generation above us, pass knowledge down to the next generation, etc). Please list and describe any such terms or expressions that exist in the language, along with their spatial meanings:

6. Are there any motion verbs or expressions used for time? For example, in English we use motion verbs like come, go, move, rush, zip, recede, approach, fly and so on to talk about time (e.g., we're coming up on the holidays, the holidays are coming up, the deadline is approaching, the weekend flew by). Please list and describe any such terms or expressions that exist in the language, along with their spatial meanings:

7. Are there any spatial prepositions that are also used for time? (e.g., I'll see you a week from now, on Tuesday, at 3 o'clock in the afternoon). Please list and describe:

8. Are there any spatial adjectives that are also used to describe duration (e.g., short concert, long meeting). How else is duration talked about? Are there quantity or volumetric terms (e.g., much, big)? Are there dedicated duration terms not used for other domains? Please list and describe:

9. How is age talked about in the language? What are the terms for young, old, new, etc?

10. Are there any other kinds of spatial expressions that tend to get borrowed to talk about time? Start with the basic/most frequent terms and expressions about time, and expand from there if you can.

11. Are there conventional gestures associated with talking about time or temporally related events?

Do people gesture behind them or upward or rightward or westward, etc when talking about the past? _____

When talking about the future? _____

How do people gesture when talking about the morning or the evening? _____

How do people gesture when talking about their ancestors? _____

How do people gesture when enumerating or talking about successive events (e.g., this happened, then this happened, then this happened, etc). _____

When arranging a time to meet or reporting when something happened, do people point to a part of the sky to indicate when things happened? _____

Are the points different for events that happen at night rather than during the day? _____

Do the points/gestures vary by season or with the tides? _____

Try eliciting gestures by asking people talk about temporal progressions and comparing different time points (weather changes, historical changes, their family through the generations, activities at different times of the day, etc). Video-record if at all possible.

12. What cultural artefacts are used to represent time?

Are there clocks? _____

Is there a calendar? _____

How do people keep track of time? _____

If you ask someone what time it is, what do they do? Do they check a watch? Look at the sun? _____

How do people tell the time at night? _____

How do people represent time in art or other graphic productions? _____

Are there drawings or diagrams showing historic changes? _____

What other kinds of artefacts are used for representing time? _____

What time periods are marked in the language? Are there days, weeks, months, years, seasons, etc? _____

13. What are the cultural beliefs about the earth and the heavenly bodies?

What shape is the earth? _____

How big is it? _____

What makes the sun rise and set every day? _____

Is the sun moving? _____

What is the sun, where did it come from? _____

What about the moon? _____

Where do stars come from, what are they, and why do they do what they do? _____

How many seasons are there and what are they? _____

What makes the seasons change? _____

How many times of day are there and what are they? _____

14. What are the cultural beliefs about the nature of time?

Are there different time periods specified in history/myth? _____
Is there a creation story? _____
Are things changing or staying the same? _____
Are there multiple time realities happening simultaneously? _____
Are we moving through time or is time moving past us? _____
Is time personified in stories (e.g., as an old man)? _____

15. What other terms are used to express temporal meanings in the language you're working with? Attached is a long (though non-exhaustive) list of temporal terms and expressions in English. Please list analogues to these expressions in the language you're working with (if they exist). Please indicate which of the expressions also have a spatial meaning. Don't be daunted by the length of the list. Any and all information is useful.

Long (but non-exhaustive) list of temporal expressions – please add more as appropriate:

English expression	**Example use**	**Translation equivalent**	**Any spatial meaning?**
a lot of time	I need a lot of time		
above	the class above us		
after	April comes after March		
afternoon	I'll see you in the afternoon		
afternoon	good afternoon		
afterward	I'll see you afterward		
again	oops, I did it again		
ago	3 months ago		
ahead	March comes ahead of April		
ahead	we are booked 3 months ahead		
an instant	it happened in an instant		
approaching	the holidays are approaching		
approaching	we are approaching the holidays		
at	I'll see you at 3 o'clock		
at	I can do 3 things at the same time		
back	let's push the meeting back 3 days		
back	the tradition goes back 3 generations		
back to back	I have appointments back to back		
before	March comes before April		
before	the best is before us		
beginning	in the beginning		
below	the class below us		
between	between 2 and 3 o'clock		
blink of an eye	it happened in the blink of an eye		
century	this century		
close	the end is close		

coming	spring is coming		
coming up	the holidays are coming up		
coming up	we are coming up on the holidays		
dawn	Dawn		
day	during the day		
day (unit of time)	this day		
day after tomorrow	I'll see you the day after tomorrow		
day before yesterday	I last saw him the day before yesterday		
days of the week	Monday, Tuesday, etc		
decade	this decade		
down	passing the knowledge down through generations		
dry season	dry season		
duration	Duration		
during	during the holidays		
dusk	Dusk		
each	each day		
earlier	I saw him earlier		
earlier than	March comes earlier than April		
earliest	what is the earliest train?		
early	I am early		
early	it is still early		
early	early morning		
end	at the end		
ending	the movie had a happy ending		
evening	Evening		
every	every week		
extended	the show has been extended		
fall	Fall		
far in the future	equality is still far in the future		
far in the past	those days are far in the past		
far off	the dry season is far off		
first	First		
fit	can you fit me in between 3 and 5pm?		
forward	I am looking forward to Tuesday		
forward	let's move the meeting forward 2 days		
free	I have 2 o'clock free (unscheduled)		
full	my schedule is full		
future	in the future		
generation	this generation, last generation, next generation, etc		
hour	Hour		
in	I'll see you in 3 hours		
in a little while	I'll see you in a little while		
in advance	please call 3 hours in advance		
in front	the best is in front of us		

in the near future	it is in the near future		
in the near past	it happened in the near past		
last	last month we went to the movies		
last (verb)	it did not last long		
last week	this was the last train		
lasting	he made a lasting impression		
late	it is getting late		
late	late morning		
late	I am late		
later	can you make it later?		
later than	I arrived later than Alice		
latest	the latest train		
length	in the full length of time, need a good length of time		
lifetime	in my lifetime		
little time	I need a little time		
long	that was a long concert		
long ago	it was long ago		
long time	that took a long time		
long way away	spring is still a long way away		
long way off	spring is still a long way off		
longer than	I can't stay longer than 3 hours		
midnight	Midnight		
minute	this minute, last minute, next minute		
moment	it will only take a moment		
month	this month, last month, next month		
months of the year	January, February, etc		
more than	it took more than 3 hours		
morning	Morning		
much time	how much time did that take?		
near	the end is near		
next	next month we'll go to the movies		
night	Night		
no more than	no more than a week		
noon	Noon		
now	I need it right now		
now (nowadays)	now the farmers no longer use plows		
old	he's old		
old	he is 12 years old		
old	this is old information		
on	I'll see you on Tuesday		
on the other side	I'll see you on the other side of it		
on the other side	I'll see on the other side of the holidays		
passed	3 months passed before		
past	in the past		
past	I talked to him 3 months past		

previous	the previous president		
prior	two weeks prior		
room	do you have any room in your schedule?		
season	this season, next season, last season, dry season, wet season		
second	it will only take a second		
short	that was a short concert		
short time	a short time		
soon	Soon		
space	in the space of an hour		
spring	Spring		
start	at the start		
summer	Summer		
sunrise	Sunrise		
sunset	Sunset		
through	they worked through the day		
time	do we have time?		
time	what time is it?		
time	this is my first time in Bali		
time	it's time to go		
today	Today		
tomorrow	Tomorrow		
top	the news starts at the top of the hour		
twilight	Twilight		
up	let's move the meeting up a couple of hours		
upcoming	the upcoming release		
upon us	the wet season is upon us		
week	this week, last week, next week, every week		
wet season	wet season		
while	it will take a while		
while	whistle while you walk		
winter	Winter		
within	I need it done within a week		
within the space of	I need it done within the space of a week		
year	Year		
yesterday	Yesterday		
young	Young		

Project outcomes

We plan to organise a workshop on the findings in the second half of 2009, and to publish the first report of the findings as a collection of papers in a special issue of a journal. The findings concerning each language's linguistic treatment of time will be included as individual papers in this collection. Discussion of the time-arranging tasks will depend on (y)our findings. We anticipate at least one overview paper synthesising these results. Papers on individual languages or subsets of languages will depend on (y)our findings. If you would like to discuss authorship before collecting and/or analyzing data please contact us directly (agaby@berkeley.edu / lera@stanford.edu).

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Stimulus set

ANCILLARY SETS


crack1.jpg


crack2.jpg


crack3.jpg


crack4.jpg


dalmatian1.jpg


dalmatian2.jpg


dalmatian3.jpg


dalmatian4.jpg


frog1.jpg


frog2.jpg


frog3.jpg


frog4.jpg


red-apple1.jpg


red-apple2.jpg


red-apple3.jpg


red-apple4.jpg

SAMPLE CODING PACKET

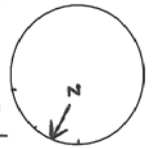
date: MAY 7, 2007 time: 2:00 PM

card arranging - sitting 1:

describe setting: inside/outside, how seated, surface used for arranging, language tested in, etc - draw diagram if necessary

seated outside, on the ground. Experimenter seated to the right of participant. tested in RUSSIAN. Arranged all cards on the grass. The area is a large grassy field surrounded by buildings which are salient + familiar landmarks.

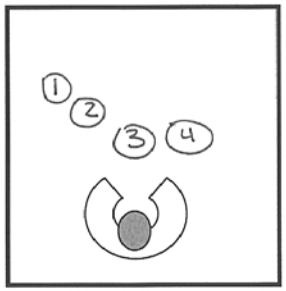
(draw North)



facing direction: SSW

If facing direction changed for any of the picture sets, please mark it in the notes for that set below.

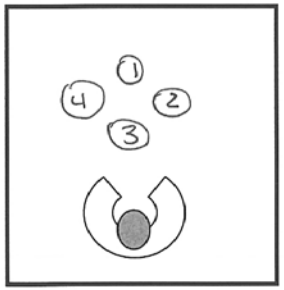
picture set: COSBY



photo(s): FD 4798.JPG

notes:

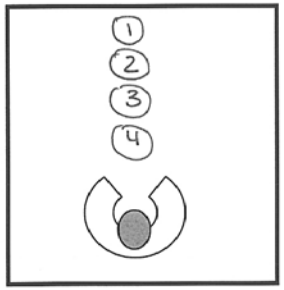
picture set: CHICKEN



photo(s): FD 4799.JPG FD 4800.JPG

notes: talked about the circular nature of the chicken and the egg

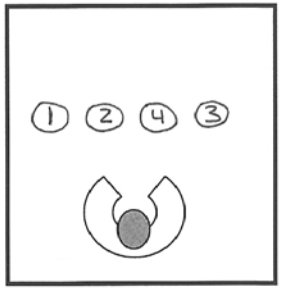
picture set: BANANA



photo(s): FD 4801.JPG

notes:

picture set: PUPPY



photo(s): FD 4808.JPG

notes: thought (4) looked younger than (3). said (3) had gray hairs.

Sample coding sheet

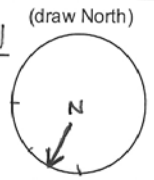
date: MAY 7, 2007 time: 2:20PM

3D pointing - sitting 1: (describe setting: inside/outside, how seated, language tested in, etc - draw diagram if necessary)

same as card arranging sitting 1.
all testing done in russian. Exp. on the right of subject.
the russian phrases used were rough equivalents of the english below. there are some aspect differences.

facing direction: SSW

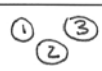
(draw North)



If facing direction changed for any of the picture sets, please mark it in the notes for that set below.

Please code direction pointed using: Above, Below, Left, Right, Far (subject points further away from their body than where you placed the middle timepoint), Near (subject points inbetween where you put the middle timepoint and their body), Behind (subject points behind themselves).

video file is: GH1743.MOV

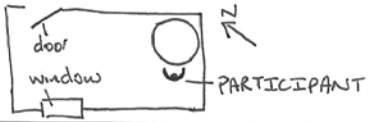
	phrase used:	direction pointed:	video refs / notes:
today – segodnya			
yesterday	vchera	Behind	 top view
tomorrow	zavtra	Right & far	
nowadays – seychas			
long ago	davno nazad	Behind	 top view
in the future	v dalnem budushe	Right & far	
this week – etanedelya			
last week	proshaya nedelya	Left	
next week	sleydnyushaya –11–	Right	
this season (e.g., summer) – leto			
previous season (e.g. spring)	vesna	UP & LEFT	 participant's view
next season (e.g. autumn)	osen'	DOWN & LEFT	
midday – pdden'			
morning	utro	UP	
evening	vecher	DOWN	
when you are sleeping – kogda vi spite			
when you are going to bed	kogda vi logilis' spat'	UP & LEFT	 PART. VIEW
when you wake up	kogda vi prosipaetes'	UP & RIGHT	

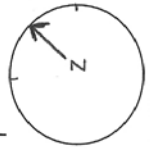
date: MAY 9, 2007 time: 9:00 AM

card arranging - sitting 2:

describe setting: inside/outside, how seated, surface used for arranging, language tested in, etc - draw diagram if necessary

seated inside at a round table. the room has one window, but it is shaded by an opaque curtain. experimenter stood behind subject.

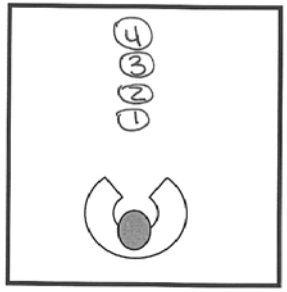




facing direction: NE

If facing direction changed for any of the picture sets, please mark it in the notes for that set below.

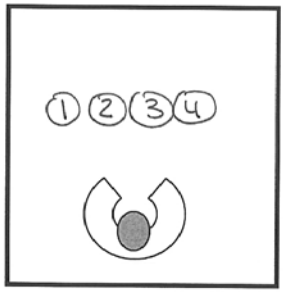
picture set: green apple



photo(s): FD4924.JPG

notes: said liked the whole apple best so put it closest

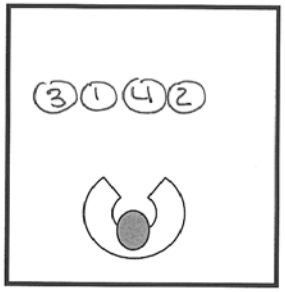
picture set: grandpa



photo(s): FD4925.JPG

notes:

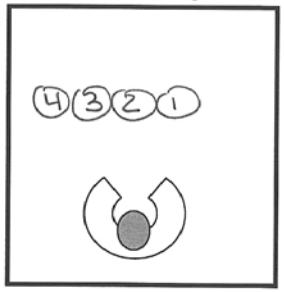
picture set: duck



photo(s): _____

notes: didn't seem to get this one. didn't really want to arrange these cards.

picture set: pregnant



photo(s): FD4927.JPG

notes: said the woman went on a diet and lost weight, so the intended order is 4, then 3, 2, 1

date: MAY 9, 2007 time: 9:15 AM

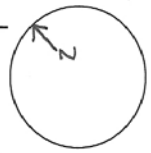
3D pointing - sitting 2: (describe setting: inside/outside, how seated, language tested in, etc - draw diagram if necessary)

same as card arranging sitting 2
experimenter on the left of the subject.
made some substitutions noted below

facing direction: NE

If facing direction changed for any of the picture sets, please mark it in the notes for that set below.

(draw North)



Please code direction pointed using: Above, Below, Left, Right, Far (subject points further away from their body than where you placed the middle timepoint), Near (subject points inbetween where you put the middle timepoint and their body), Behind (subject points behind themselves).

wednesday — sreda	phrase used:	direction pointed:	video refs / notes: VIDEO FILE IS GH1746.MOV
tuesday	vtornik	LEFT	
thursday	chetverg	RIGHT	
the age you are now – vash ~~[illegible]~~vozrast seychas			
when you were a baby	kogda vi bili malenkie	DOWN	② PARTICIPANT'S ① ③ VIEW
when you will be very old	kogda vi sovsem sostarites'	DOWN & RIGHT	
this month – etot mesyats			
last month	proshliy mesyats	LEFT	
next month	sleduyshiy mesyats	RIGHT	
this year etot god			
last year	proshliy god	UP	
next year	sled. god	DOWN	
noon polden'			
sunrise	~~[illegible]~~solntse vstayot	DOWN	PUT ① or ③ in the same place below ②
sunset	zakat	DOWN	
middle of the night – seredina nochi			
~~dusk~~ evening	vecher	UP	PUT ③ in the same place as ②
~~dawn~~ morning bugle	razboi	SAME AS ②	

participant name: KALERIA ROMANOVNA date: MAY 9, 2007 time: 10:00 AM

spatial knowledge:

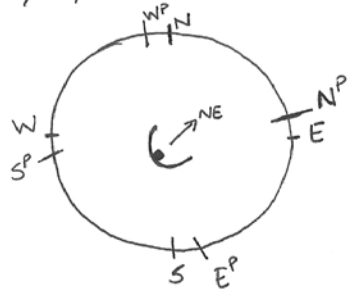
Please ask the participant to point left/right, N/S/E/W, forward/back, or any other relevant directions represented in the language. In the space below please note which directions were tested and the results. Draw diagrams when necessary. Tested in the same room as sitting 2, facing NE

Pointed Left & Right no problem - no hesitation.

N/S/E/W, hesitated, then pointed about 85° off for each direction

Actual N/S/E/W is marked N/S/E/W

Participant's points are marked $N^P/S^P/E^P/W^P$



Pointed front/back & up/down no problem.

Video file for ~~the pointing~~ this spatial test is: GH1747.MOV

Participant name: KALERIA ROMANOVNA Age: 30 Gender: F

Primary language spoken: RUSSIAN What language(s) is the participant being tested in? RUSSIAN

Other languages spoken: ENGLISH (5), FRENCH (2)

(include level of fluency for each language: 1=barely speaks, 5=very fluent):

What language(s) is the participant literate in? Russian (10) English (10) French (8)

(include level of literacy for each language: 0=none, 10=very high)

Level of education: PhD

Photo/video files created for this participant: listed on individual coding sheets in this packet
put in folder kaleria_romanovna_time

Other notes:

grew restless toward the end, so maybe last few sets are not that indicative. was trying to overthink the questions a bit.