

Mundurucu terms with arithmetical, geometrical, and spatial content

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The following list of words (revised May 2022), established with the help of several informants who are native speakers of Mundurucu, updates previous documents such as the list published as Supplementary Online Materials in Dehaene, Izard, Pica, & Spelke (2006), Core knowledge of geometry in an Amazonian indigene group, *Science*, 311(5759), 381-384.

Arithmetical terms

Number words

pũg-ma one-FOC	only one of a set, one (literally: ‘exactly one’)
xep-xep scar-REDUP	a pairwise spatial arrangement, twosome; two (literally: ‘two scars’, also: xep-xem ‘twice’)
e-ba-pũg your-arm-one	a spatial arrangement of three, a trio; threesome; three (literally: ‘your (two) arms + one’, a trio seen as a set of two + one;)
ebadip-dip companion-REDUP	a spatial arrangement of four, foursome; four (literally: ‘your companion + one’, a foursome seen as conjunction of two duos or a conjunction of a trio + one)
pũg-põgbi one-handful	a handful; a spatial arrangement of five
xep-xep põgbi scar-REDUP handful	two handfuls, a spatial arrangement of ten
e-ba-pũg põgbi your-arm-one handful	three handfuls, a spatial arrangement of fifteen

Quantifiers

a-de individual(s)-multiple	a large quantity/ number (seen as a dense arrangement of various individuals); plentiful, many; several
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a-de-de individual(s)-multiple-REDUP	multitude (seen as an arrangement made of various groups of 'ade')
a-de sũ individual(s)-multiple rather	rather large quantity/ number
a-de ma individual(s)-multiple really	really large quantity/ number
a-de jijã individual(s)-multiple very	very large quantity/ number
a-de ġu individual(s)-multiple NEG	not a large quantity/ number (literally: 'not a lot')
a-de-'ũm individual(s)-multiple-lifeless	not any longer a large quantity/ number
pũg-pũg pũg-REDUP sparse spatial	a certain quantity/ number (seen as a dense spatial arrangement of individuals or objects; some; a small quantity/ number (seen as a arrangement); a few
so-at grasp(ed)-REL	the total quantity/ number (seen as a complete arrangement of various individuals); all; every
so-at -'em-ma grasp(ed)-REL-times-AFF	all the time, always
so-at ġu grasp(ed)-REL NEG	not the total quantity/ number; some
xêp-xêp xêp-REDUP	a small quantity/ number (seen as a sparse arrangement of various individuals); few
xe-re near-joined	a small number of elements of the same type that are close to the speaker, few, scarce
xi-ri much/many-double	a large or double quantity/ number of elements of the same type; abundant

Other expressions of quantity

bit	contrastive focus marker (literally: 'as opposed to')
bit-ku size-AFF	of a given size (typically accompanied by two-hand gesture defining a certain extent)
bo-ğũn size/distance/time-similar	of a certain extent, size, distance, time... (typically accompanied by two-hand gesture defining a certain extent)

(i)-bu-rũ PRON-line-vibration	a certain quantity/ number/ magnitude
i-mu-ade-de-m PRON-CAUS-many-REDUP-Adv	to increase, intensify a quantity or number (literally: 'to make become many', by extension: 'to multiply (something)')
i-mu-'ẽ-'ẽ-'ẽ-m PRON-CAUS-time- REDUP-REDUP-Adv	to split, distribute a quantity or number (literally: 'to make become many times', by extension: "to divide (something)")
i-mu-wěḡun PRON-CAUS-equal.quantity	to put (the same quantity or number) on both sides (by extension: 'to count to measure (something)')
pe-bu-rũ which-line-vibration	which quantity/ number/ magnitude
pe-bo-ḡũn which-size/distance/time- similar	which size/distance/time
'ũm	lifeless, stiff; not abundant

Degree words

ji-jâ/ci-câ ji-much	very
sû (sû) distant; difficult to see	more or less
pe-bit which-size	which size

Ideophones used in narrative contexts (uttered with a gesture indicating a variable extent)

kiiih/ kih kih kih	ideophone of variable duration, indicating a large quantity (numerosity, duration, or spatial extent). The duration of the syllable refers to the quantity depicted
kuuuh/ kuh kuh kuh	ideophone of variable duration, indicating duration or spatial extent. The duration of the syllable refers to the quantity depicted.
tõõõõõõ	ideophone of variable duration, indicating a small quantity (numerosity, duration, spatial extent). The duration of the syllable refers to the density of the stimulus.

Ordinal words

ko-ap grouping-origin	foremost, first
no-mu-ju after-CAUS-comer	the last (literally ‘the one (who comes) after’)

Comparative words

bo-di bo-separation	more (on the other side) (literally: “over there”) (by extension: ‘more’)
i-buxi-m PRON-equal-Adv	equal, similar to, close to (something)
i-jo’i PRON-similar	similar to (something) (by extension: ‘equal’)
i-waru PRON-different	different
we-ğün equal-quantity	same quantity, number, or distance (literally: ‘on each side’) (by extension: ‘middle’)

Geometrical terms

Figures

i-roy-ruy-’at PRON-spherical-REDUP-REL	spherical, cylindrical, or roundish object (by extension: circle, smooth shape)
i-wa-ket-kut-’at PRON-side- patched-REDUP-REL	irregular polygon, asymmetrical object (by extension: irregular shape)

Points, lines, angles

cũg	upright, straight; not bent
i-bu-cũg PRON-finger-straight	a line that goes straight up or straight ahead
e-ta-ko e-eye-ko	lateral side(s) of the body
ka-di place-water	vertical side

ta-rüg-at eye-sharp-REL	sharp (with ‘eye’ interpreted as a point)
ya-bi-ta-rüg rigid.tip-ray-eye-sharp	sharp point
ya-rög rigid.tip-corner	corner; angle (viewed as an angular part of a surface)

Metric proportions

a-pi-n a-shrink-n	of limited reach or size in terms of height or length
i-be-re-n PRON-in-long-n	of a certain reach or size in terms of length
i-’i-n PRON-small.bit-n	small bit (of something), piece
ipi-d-a-se ground-d-point-above	middle (literally: a vertical line above a point on the ground that separates two lateral spaces)
ipi-d-a-se-sũ ground-d-point-above -more.or.less	right in the middle (literally: somewhat above a point on the ground that separates two lateral spaces)

Spatial terms

In/out

ba-di dense.interior-side	in; inside (seen as a dense arrangement or region)
bi	inside
bo-di bo-separation	outside, on the (other) side

To/from

be	in, at, towards
(be)-wi to-from	from (literally: ‘from (to)’)
eju	with, in company of

kay to, in the direction of; up

kuḡ in contact with; with

Above/below/aside

je-je the space right above a surface as a motion or an extension; over
above-REDUP

a-se in a higher place than a given point, above
point-higher

ti-ot (pe) below, under a surface
water hole (towards) (seen as a dense and complex arrangement or region)
(literally 'the place where the water stops flowing')

ya kaba (be) at his/its side (literally: 'to his/its shoulder')
shoulder side (at)

kabi kadi above (literally: 'on the side of the sky') (by extension: more)
sky side

ipi-kadi the side of the ground, lower (by extension: less)
ground-side

u-m above, high
light-Adv

In front/behind

dopa be in front of (seen as a sparse or simple arrangement or region)
face towards (literally: 'to his/its face')

(ya) nōḡ-pita be behind, at the back(side)
(rigid.tip) obstacle-back at

Near/far

wuy distance between two objects; distance; distant; destination (haven)
distant

xe close to, by the side of, in the presence of
near

Through

d-aḡ/t-aḡ in the middle of, inside
through-middle

d-eḡ/t-eḡ
though-rupture across, by means of

d-oḡ/t-oḡ
through-obstacle through the center

Left/right

i-ba-at ka-di on the side of the (right) arm
PRON-arm-REL side

i-ba-uḡ ka-di on the left side
PRON-arm-mirror.image side

Here/there

Adverbs

Proximate

i-jo-ce about a place, here (literally: ‘this place here’)
PRON-visible-PROX about a close visible and exact location that can be pointed to

i-jo-di about a visible location towards the direction of the speaker
PRON-visible-separation Over here (literally: ‘this place here within eye-range’)

i-jo-ma about a place in the direction of the speaker
PRON-visible-FOC

Distal

i-bo-ce about a place, there (literally: ‘this place over there, out of range’)
PRON-place-PROX

i-bo-di about a place, over there (literally: “this place over there,
PRON-place-separation on the other side”)

i-bo-ma about a location, in the opposite direction
PRON-place-FOC than the one of the speaker

Deictics

Proximate

i-j-op that one about an object, within reach, horizontal on the ground
PRON-visible-horizontal (literally: ‘that object (on the ground) close to the speaker’)

i-j-a this/that one (literally: ‘this one close to the speaker and
PRON-visible-graspable interlocutor’) about an horizontal or vertical object at hand’s reach

i-j-u PRON-visible-light	that one (literally: 'that object here in my hand') about an concrete object hanging at hand's reach
i-te PRON-vertical	this one (literally: 'the one that is out of range and whose tactile presence can suddenly be detected')

Distal

i-bo PRON-place	this/that one out of range over there, topic of the discourse (literally: 'this/that one away from the speaker')
i-xe PRON-shared	this one over there (literally: 'this one visible to the speaker and interlocutor')
i-'e PRON-ear	this one that is out of visual range and can be heard (typically accompanied by a vertical gesture near the ear)
i-ǵo PRON-DEICTIC	this/that one there (typically accompanied by a gesture defining an a vertical or horizontal axis)

Directions and axes

kaxi je-m ap sun/moon REFL-Adv from	sun/moonrise (literally: 'the place from which the sun/moon rises')
kaxi a cap sun/moon place from	sun/moonset (literally: 'the place at which the sun/moon declines'), setting.
kaxi-cǵg sun/moon up.straight	The vertical line that can be drawn from the sun/moon to the ground, with the sun/moon viewed as a person standing upright (by extension, 'zenith')
kaxi jo-dek sun/moon visible-middle	the slanted line that can be drawn from the sun/moon to the ground, with the sun/moon viewed as a person slightly bent as compared to its upright position.
kaxi-cere-re sun/moon-inclined-REDUP	the slanted line that can be drawn from the sun/moon to the ground, with the sun/moon viewed as a person bent close to the ground like the sun/ moon before setting or after rising.
kaxi-pi-teǵ sun/moon-ground-close	the horizontal line that can be drawn from the sun/moon to the ground, with the sun/moon viewed as a person lying on the ground, (by extension 'moon/sunset, moon/sunrise').
yabi-cǵg shoulder-up.straight	the vertical line that that corresponds to a person standing up or an object analyzed anthropomorphically standing straight.

yabi-jo-dek shoulder-visible-middle	the slanted line that corresponds to a person whose head is slanted slightly bent; object analyzed anthropomorphically that is slightly bent as compared to its straight position.
yabi-cere-re shoulder-inclined-REDUP	the slanted line that corresponds to a person whose head is bent or an object analyzed anthropomorphically bent close to the ground like the sun/ moon before setting or after rising.
we-tabi-ju my-eyes-in.contact	(lit. 'at my eyes', at eye level), by extension 'horizon'.
ti-a-kay river-up	upstream (literally: 'up the river')
de-i-m flow-become-Adv	downstream (literally: 'in the direction of the current/ flow')

Geometry-sensitive classifiers

-’a/ya	head-like, compact, often rounded, superior and salient part of a person or object, or collection of objects. (by extension: rigid tip, rigid extremity) e.g. ya-’a 'his head', kokok-’a 'owl head', gudup-’a 'buriti-fruit', ipara-’a 'pineapple', wexik-’a 'potato', ûg-’a 'knee(s)', yaôpi-’a 'shoulder(s)', wita-’a 'stone', mun-’a 'rounded recipient', kapedi mûn-’a 'bottle of coffee', karapa’a 'carafe', ajaraô-’a 'round pan', uk-’a 'circular house'
-da/ta	grain-like/eye-like, deformable and rounded body part or object, or collection of objects. e.g. axima-ta 'fish eye(s)', xabi-da 'heart', da-it 'seed', poro-da 'tick(s)', ta-da 'stomach', xabi-da 'snail', sako-da 'rounded bag', ukpi-ta 'anus', ikum-ta 'nipple(s)', kasop-ta 'star(s)', eda-ta 'tobacco seed(s)', kao-ta 'grain(s) of salt'
-bu/pu	finger-like, thin, elongated, flexible, not very dense, and possibly tubular body part, object, or collection of objects. e.g. Celso-bu 'Celso's hand(s)/finger(s)', ago-bu 'neck', aguy-bu 'ear(s)', na-bu 'nose', ta-bu 'nostril(s)', puy-bu 'snake(s)', akora-bu 'electric fish', ixi-bu cipo 'liana', toro-bu 'clothesline', day-pu 'penis', cekûrûrûk-pu 'vein(s)', na’ôt-pu 'larva(ae)', nasêg-pu 'earthworm(s)', xek-pu 'lizard(s)', korda-pu 'rope(s)'
-ba/pa	arm-like, thick, elongated, dense but somewhat flexible body part, object, or collection of objects. e.g. Celso-ba 'Celso's arm(s)', ako-ba 'banana fruit(s)', ge-ba 'wing(s)', kamixa-ba 'shirt sleeve(s)', akoborôgrôg-pa 'silverish banana(s)', akopakpak-pa 'reddish banana(s)', ako’un’un-pa 'lady finger banana(s)', akorurut-pa 'whitish banana(s)'

-bi/pi	mouth-like dense, thick, convex body part, cavity, object, or collection of objects. e.g. axima-bi 'mouth of a fish', ibôg-bi 'wrist(s)', ta-bi 'vulva', bio-bi 'snout of the tapir', xa-bi 'thoracic cage', bog-bi 'handful', ikum-pi 'chest', yuk-pi 'buttock(s)'
-dap/tap	hair-like thin, deformable, stretchable body part, object, or collection of objects. e.g. ya-dap 'head hair', iparara-dap 'pineapple spine(s)', korere-bi-dap 'suriri-fish fin', sapokay-dap 'hen feather(s)', kak-tap 'fox pelt', abikbik-tap 'sofa dust'.
-dup/tup	leaf-like flat, thin, deformable body part, object or surface, or collection of objects. e.g. u-tup 'palm leaf', i-dup 'foot sole(s)', bu-dup 'hand palm(s)', bixe'e-dup 'lips, beak', warepupu-dup 'butterfly', mureo-dup 'bat(s), umbrella(s)', tapera-dup 'sheet(s) of paper', koykoy-dup 'paddle(s)'.
-di/ti	viscous, deformable fluid(s). e.g. bi-di 'saliva', pi-di 'spit', ta-di 'tear(s)', kape-di '(liquid) coffee', ka-di side, kum-ti 'breast milk', xep-ti 'resin'.

Abbreviations

Adv	Adverbial marker
AFF	Affirmation marker
CAUS	Causative marker
FOC	Focus marker
NEG	Negation
PRON	Pronoun
PROX	Proximate marker
REDUP	Reduplication
REFL	Reflexive marker
REL	Relative marker