

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

pūg-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-pūg 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)
pūg-pōgbī one-handful	a handful; a spatial arrangement of five
xep-xep pōgbī scar-REDUP handful	two handfuls, a spatial arrangement of ten
e-ba-pūg pōgbī 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 sū individual(s)-multiple rather	rather large quantity/ number
a-de ma individual(s)-multiple really	really large quantity/ number
a-de jijā 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-'ūm individual(s)-multiple-lifeless	not any longer a large quantity/ number
pūg-pūg pūg-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
xēp-xēp xēp-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-ğün size/distance/time-similar	of a certain extent, size, distance, time... (typically accompanied by two-hand gesture defining a certain extent)

(i)-bu-rū 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-'ë-'ë-ë-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-wëgün PRON-CAUS-equal.quantity	to put (the same quantity or number) on both sides (by extension: ‘to count to measure (something)’)
pe-bu-rū which-line-vibration	which quantity/ number/ magnitude
pe-bo-ğün which-size/distance/time- similar	which size/distance/time
'üm	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	more (on the other side)
bo-separation	(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-ÿün equal-quantity	same quantity, number, or distance (literally: ‘on each side’) (by extension: ‘middle’)

Geometrical terms

Figures

i-roj-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

cūg	upright, straight; not bent
i-bu-cūg 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-rūg-at eye-sharp-REL	sharp (with 'eye' interpreted as a point)
ya-bi-ta-rūg rigid.tip-ray-eye-sharp	sharp point
ya-rōg 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-sū 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

ku̇g 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) nōg-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-ȧg/t-ȧg in the middle of, inside
through-middle

d-eğ/t-eğ
through-rupture

across, by means of

d-oğ/t-oğ
through-obstacle

through the center

Left/right

i-ba-at ka-di
PRON-arm-REL side

on the side of the (right) arm

i-ba-uğ ka-di
PRON-arm-mirror.image side

on the left side

Here/there

Adverbs

Proximate

i-jo-ce
PRON-visible-PROX

about a place, here (literally: ‘this place here’)

about a close visible and exact location that can be pointed to

i-jo-di
PRON-visible-separation

about a visible location towards the direction of the speaker

Over here (literally: ‘this place here within eye-range’)

i-jo-ma
PRON-visible-FOC

about a place in the direction of the speaker

Distal

i-bo-ce
PRON-place-PROX

about a place, there (literally: ‘this place over there, out of range’)

i-bo-di
PRON-place-separation

about a place, over there (literally: “this place over there,

on the other side”)

i-bo-ma
PRON-place-FOC

about a location, in the opposite direction

than the one of the speaker

Deictics

Proximate

i-j-op
PRON-visible-horizontal

that one about an object, within reach, horizontal on the ground
(literally: ‘that object (on the ground) close to the speaker’)

i-j-a
PRON-visible-graspable

this/that one (literally: ‘this one close to the speaker and

interlocutor’) about an horizontal or vertical object at hand’s reach

i-ju
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-̃go
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-cūg
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-teg
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-cūg
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