EFFECTS OF SOCIOCULTURAL EMBODIMENT ON USE OF RUN

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Submitted in partial fulfillment of the requirements
For the degree of Master of Arts

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May, 2011
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Effects of Sociocultural Embodiment on Use of RUN

Abstract

by

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Embodiment, or the way that the world and human interactions with it help to shape cognition and language, is a central topic in cognitive linguistics. Rohrer (2006) writes of three dogmas of embodiment. One of these dogmas is viewing “embodiment as an eliminative reductionism”. Specifically, Rohrer cautions against reducing the study of embodiment and cognitive linguistics to solely the biophysical world, at the expense of the sociocultural world. Rohrer also suggests using converging evidence from cross-disciplinary methodologies to help resolve the dogmas. This thesis takes the concept RUN and situates it both in a sociocultural context and a neurophysiological context. By building idealized cognitive models from language data from Tarahumara, Basque, and English as well as considering the sociocultural world of a language community, RUN is compared across environments and used to determine cultural effects on concepts that from afar seem purely physical in nature.
I. Introduction

Humans live in a large world. They interact with the world in various ways, but the medium for all of these interactions is their bodies. According to Gibbs, embodiment refers to “understanding the role of an agent’s own body in its everyday, situated cognition.” (Gibbs 2005: 1) The concepts of embodiment and embodied activity play “a role in at least some aspects of language evolution, the processing of speech and word meaning, how people understand why various words and phrases have the meanings they do, and people’s immediate comprehension of verbal expressions and written discourse.” (Gibbs 2005: 207) This not only refers to basic uses of language or purely physical concepts. Rather, “people do not understand the nonliteral meaning of … figurative phrases as a matter of convention. Instead, people actually understand ‘toss out a plan’, for instance, in terms of physically tossing something.” (Gibbs 2005: 184)

Given the established importance and ubiquity of embodiment to cognitive science, it would be prudent to consider it as a piece of evidence in a program of converging evidence to explain various cognitive linguistic phenomena. Conceptual metaphor theory is one area where embodiment can serve to explain how language is used. Specifically, metaphors such as MORE IS UP have seen plausible explanations through physical embodiment. Intuitively, as one piles more and more of a material in a location, the pile will grow taller. Hence, UP is in this case correlated with MORE, and
the correlation is extended to a more robust metaphor. With this we may see an utterance such as:

(1) Microsoft is up.

where the value of a stock has increased, which is akin to a growing pile of money.
Microsoft is metonymically equated with the growing pile of money, and thus “Microsoft is up”. Another example is seen in the “x is at another level” construction:

(2) A D1 college football player is good, but an NFL player is at another level.

Here there are two football players with varying amounts of skill. The D1 college football player has a fair-sized metaphorical pile of skill, while the NFL player has a gigantic metaphorical heap, which if manifested physically would be of sufficiently more height that it could be said to be “at another level”.

As long as one agrees with these or similar analyses of sentences like (1) and (2), the effects of physical embodiment on language itself are evident. However, the physical world and physical objects are not the only things affecting a human and his mind. In addition to being situated in a physical world, a human is also situated to some extent in a social world. The social world of someone living in New York City or Tokyo may be extremely enormous and complex; the social world of someone living as a hermit on an obscure wooded mountainside may be less so. Wherever one lives, though, he encounters social interactions with other people, or the lack of social interactions, which will shape
how he himself views and interacts with others socially. This is akin to how someone’s physical interactions with the world in which he lives effect his subsequent interactions with whatever he encounters. His social interactions also affect how his mind will perceive or interpret any subsequent information and how he uses it, perhaps also including language.

Rohrer (2006) describes the study of cognitive linguistics, specifically using embodiment as a tool, as having three dogmas. These three dogmas are treating embodiment as an eliminative reductionism, treating embodiment as temporally static, and treating embodiment as a specifically conscious or unconscious process. The dogma of most interest to this discussion is that of treating embodiment as an eliminative reductionism. To describe what he means by this, Rohrer describes a philosophical paper he read in the past. The paper attempts to analyze love through methods of symbolic logic. The author of the paper in the end produces a formula which he claims describes love as it is seen in relationships.

Using the philosophy paper as a jumping-off point, Rohrer goes on to note his fear that cognitive linguistics is suffering from taking a similar risk as the author of the philosophical paper on love. As a more directly related example, Rohrer talks of certain extreme formulations of a Neural Theory of Language. He notes that there are arguments that, similar to the way linguistic structure reflects brain structure, underlying brain structure imposes its image schemas, superpositions, and universal primitives causally onto language. From such arguments, socio-cultural linguists may perhaps justifiably draw the implication that theories of language will eventually be eliminated in favor of more theories that are purely neurological in nature. In other words, as the
aforementioned philosopher attempted to end discussions of love with a very straightforward formula, some cognitive linguists may run the risk of replacing discussions of syntax, semantics, or grammatical constructions with discussions of axons and sodium-potassium ion pumps.

Of course, evidence of how the brain and the body it resides in interact with the world is very important and should be taken into consideration. The importance of pointing out the dogma of eliminative reductionism in cognitive linguistics, though, is to caution researchers and theorists to not completely ignore the socio-cultural embodiment that is also present. It does not seem like such a reduction of the field has yet happened, but such a cautioning nevertheless has some worth.

To counter the risk of such a dogma, we must, as Rohrer says, “realize that even brain structures are not isolated, static entities, but are embedded within a nervous system and body that interacts with both physical and sociocultural space.” (Rohrer 2006) This at first may seem a bit idealistic. After all, physical embodiment lies in the physical realm, with atoms, their bonds, and actual physical, tangible objects and forces at work. Sociocultural embodiment, in contrast, lies in a more abstract realm. A culture cannot be described by equations or be easily subjected to repeatable, verifiable experimentation. However, at least using the concept of sociocultural embodiment as part of a body of converging evidence to help explain appropriate phenomena should be possible. Successful performance of such a task would in part justify Rohrer’s warning. First, though, appropriate phenomena must be found.

Human culture is a complex body of interactions. Any given culture may have prominent ceremonies, games, holidays, traditions, foods, and of course languages.
Furthermore, the ceremonies, games, etc., will most likely differ between cultures. Just as different cultures may celebrate different days as different holidays for their own reasons, different cultures will also speak different languages with different structures, the reasons again varying. To further investigate the interaction between physical and social embodiment in cognitive linguistics, an appropriate laboratory must be found; some aspect of language should be investigated, an aspect which could conceivably be effected by both sociocultural and neurophysiological embodiment.

To that end, basic motion verbs may give a window into the interaction at the focus of this discussion. Basic motion verbs such as walk, run, trot, jog, crawl, and many others, undoubtedly are affected by human embodiment when used in human language. Most humans, for example, have experienced what it feels like to crawl. In English, the word crawl describes the action of moving along the ground using both hands and knees for support and the appropriate muscles for propulsion. In addition to evoking the physical action of crawling, though, the word can also be used in a more abstract, or metaphorical, sense. A common English metaphor describes time as crawling.

To fully understand this metaphor, one must first understand another conceptual abstraction of time moving through space. Time and space are usually considered separate dimensions of reality. In a crawling time metaphor, though, time is instead imagined as tangible and moving either towards, past, or away from a reference point. The imagined tangibility of time combines with the physical action of crawling. Because crawling is usually slower than a more de facto means of locomotion such as walking, the end effect of the metaphor is the perception that time is moving slowly from the reference point of a speaker or observer.
That neurophysiological embodiment effects the use of basic motion verbs is evident from examples such as the crawling time metaphor. To more fully investigate the dogma of eliminative reductionism, however, one must also find a laboratory that includes at least a plausible possibility of sociocultural embodiment. Given the vast diversity of human cultures, the driving force behind the sociocultural embodiment could come from many sources. One source might be found in the language spoken by the people living within a culture.

Human languages, like cultures, are quite diverse. They can be divided up into many different families with genetic affiliations. They can also be classified in many ways along many continua. One such classification is referred to as the morphosyntactic alignment. A language’s morphosyntactic alignment is the method by which it distinguishes between the arguments of transitive verbs and intransitive verbs. Transitive verbs are those with two core arguments, which in English correspond to a subject and an object. Intransitive verbs are those with only one core argument, which in English corresponds again to a subject. This morphosyntactic alignment is referred to as nominative-accusative. Nominative-accusative languages treat the subject argument of an intransitive verb (S) the same as the subject, or agent, argument of a transitive verb (A). Both S and A in a nominative-accusative language are distinct from the object argument of a transitive verb (O). However, this is only one way for a language to break up these grammatical relations.

Another common morphosyntactic system is the ergative-absolutive alignment. In the ergative-absolutive alignment, the intransitive S argument is treated the same as the transitive O argument, while both are distinct from the transitive A argument. An
example of an ergative-absolutive language is Basque, an isolate spoken in the Basque country of northeast Spain and southwest France. The distinction between the ergative-absolutive alignment and the nominative-accusative alignment is illustrated in the following examples in Basque and English:

(3) Gizona etorri da.
    The.man-abs has arrived.
    The man has arrived.

(4) Gizonak mutila ikusi du.
    The.man-erg the.boy-abs saw
    The man saw the boy.

(5) The man has arrived.

(6) The man saw the boy.

In (3) and (4), gizona and mutila, man and boy, respectively, are marked as serving the same grammatical purpose. Both are in the absolutive case. As explained earlier, Basque marks objects (O) and intransitive subjects (S) in the same way. Both have a distinctive marking from gizonak in (4). The English translations of gizonak and gizona are in this case the same, but because “man” in (4) serves as the agent of a transitive verb (A), it has an ergative marking.
In (5) and (6), the same sentences are given in English. English usually marks S, O, and A by word order, lacking the more robust case system of other languages. “Man” in both (5) and (6) are in the English subject position. Thus, unlike Basque where S and O are marked together, in English S and A are marked together. Also, in (6), “boy” is marked as an object by the word order, distinct from the subject markings of “man” in both sentences. In Basque, “boy” in (6) and “man” in (5) would be marked in the same way.

The differences in morphosyntactic alignments of human languages may be a source of sociocultural embodiment. Languages are part of human culture and human society. Given how a human’s physical experience results in embodiment effects, a human’s morphosyntactic experience might produce embodiment effects as well. Because Basque and English mark S, O, and A differently, they might use the verbs which call for the markings in different manners. The metaphorical and abstract uses of a basic motion verb in Basque could be different from the uses of the equivalent verb in English, and the difference may be explainable through sociocultural embodiment.

Traditions and significant trends are another aspect of culture and society that might potentially contribute to the effects of sociocultural embodiment. If a culture has an important enough activity, holiday, or game, it may possibly result in embodiment effects, shedding light on the dogma of eliminative reductionism raised by Rohrer. Investigation of this possibility should make use of a laboratory which could also see effects of neurophysiological embodiment. For this, basic motion verbs may again be appropriate. If a culture with a significant importance placed on an action described by a
basic motion verb is investigated, that culture’s language may show the effects being searched for.

The Tarahumara culture of Chihuahua in northern Mexico may be such a culture. The Tarahumara call themselves Rarámuri, meaning “runners on foot”. As the name Rarámuri suggests, running has a large place in the Tarahumara culture. Many of the Tarahumara villages are located in the Copper Canyon, an area of rough terrain. Communication and transportation between villages often relies on running journeys of multiple days. The Tarahumara have also been known to use a method of hunting referred to as persistence hunting. Persistence hunting involves running after one’s prey, a deer, for example, until it collapses from exhaustion, at which point it is easily subdued by the hunter.

Additionally, the Tarahumara have a set of significant competitions with important running elements. Tarahumara men participate in the rarajipari, while the women participate in the dowerami. The rarajipari and dowerami are effectively racings of around 50 to 100 miles. The rarajipari involves also kicking a wooden ball, while the dowerami involves throwing hoops. These competitions last for multiple days and see much community involvement. Spectators provide nourishment for the competitors, as well as light at night. They are a major social event that draws out most of the community.

The Tarahumara language, then, may be appropriate to test the effects of sociocultural embodiment with a basic motion verb. Given the importance of running to the Tarahumara culture, the concept RUN will be the center of the investigation.
In order to test the effects of sociocultural embodiment, a corpus study of RUN in English, Basque, and Tarahumara was conducted. English is used as a point of comparison for the other two languages. English is very widespread and thus relatively neutral when it comes to the cultural importance of RUN. Additionally, it is morphosyntactically nominative-accusative. Basque, as explained earlier, is ergative-absolutive and also relatively neutral with respect to the cultural importance of run. Tarahumara is nominative-accusative with respect to subjects and objects. It also has an absolutive suffix that indicates an object is not owned. However, the suffix is dropped in the presence of other suffixes. This investigation will then take English as a relative control language, and treat morphosyntactic alignment and cultural importance of RUN as independent variables. The use of RUN is investigated in English, Tarahumara, and Basque, in order to find possible effects of sociocultural embodiment on its use.

II. Methods

The use of RUN was investigated in each of three languages: English, Tarahumara, and Basque. The investigations were conducted using corpus methods. An explanation of each corpus follows.

For English, the Corpus of Contemporary American English (COCA) was used. COCA is an online corpus created by Mark Davies of Brigham Young University in 2008. The largest freely-available corpus of American English, it is large and balanced at more than 410 million words divided between spoken, fiction, popular magazine,
newspaper, and academic genres. The online interface allows for automatic search of exact phrases, lemmas, and parts of speech. For this investigation, search of the lemma “run” was used.

For Basque, the Euskara Corpusa was used. The Euskara Corpusa is another online corpus. It is maintained by the Euskaltzaindia, the Royal Academy of the Basque Language. Euskaltzaindia is the official standardizing body of the Basque language. The Euskara Corpusa searches 4,658,036 words of text in varied dialects and genres, including administrative documents, textbook, literary prose, poetry, voice transcripts, and newspapers and magazines. Like COCA, Euskara Corpusa can search for phrases, lemmas, and parts of speech. For this investigation, the search of two lemmas, *lasterka* and *korrika* was used.

For Tarahumara, the corpus was a 112-page Tarahumara-Spanish parallel storybook, *Jena Ra‘icha Ralámuli Alué ‘Ya Muchígame Chiquime Niliga. Aquí relata la gente de antes lo que pasaba en su tiempo*. The corpus is limited to children’s stories and the search was performed manually for forms of Tarahumara RUN.

Once the searches were performed, the uses of RUN found in each language were categorized. The constructions in which RUN occurred were identified and radial category structures were created for comparison between languages. Radial category structures are explained by Lakoff in *Women, Fire, and Dangerous Things: What Categories Reveal about the Mind*. Lakoff describes a radial structure as “one where there is a central case and conventionalized variations on it which cannot be predicted by general rules.” (Lakoff 1986: 84) Generally, the center of a radial structure for RUN will be the plain, physical sense of animate locomotion. In order to create the radial structures
for Basque and Tarahumara, dictionaries were consulted in addition to the aforementioned corpora. This is because this paper’s author is not a fluent speaker of either Basque or Tarahumara, and also because the Tarahumara corpus and to a lesser extent the Basque corpus are orders of magnitude smaller than the English corpus.

III. Tarahumara Data

Tarahumara is an Uto-Aztecan language spoken by approximately 70,000 people, primarily in the Mexican state of Chihuahua. The largest dialect, Western Tarahumara, has around 55,000 speakers, of which 10,000 are monolingual. The rest are, for the most part, bilingual with Tarahumara and Spanish. Tarahumara syntax is quite flexible, but it does have a default SOV word order. Importantly for this study, Tarahumara nouns are morphologically nominative-accusative in subjects and objects. In this respect it is like English, but it was chosen for this study primarily because of the significance the physical act of running has in the Tarahumara culture.

Although there is a definite running culture in the American English-speaking world, it essentially remains confined to self-improvement purposes, such as weight loss, or to a competitive arena; even this is fairly marginal. Tarahumara culture, by contrast, is pervaded by the act of running.

Thord-Gray (1955) lists several basic forms for Tarahumara RUN: huma, mawa, maa, ma, naha, maya. Standing alone, without affixes, they correspond directly to
English run. Thord-Gray also lists several additional meanings given with the use of suffixes:

Run after (-to)
Gad, wander in search of pleasure (-to)
Flirt (-to)
Walk the streets of the pueblo (-to)
Run away, as from danger or evil, or to avoid punishment (-simi)
Flee at random or in confusion (-simi)
Run from danger, take flight, be in flight (-ka eyena)

The listed uses do not extend to motion by non-living entities, as in English running water. In this case, Tarahumara takes bawa (water) and contracts it with yena/eyena, to form ba-yena, or “traveling water”. The suffixes –simi, -yena, -eyena, mean “to go or travel”. They can be seen in combination with Tarahumara RUN as noted above.

The Tarahumara data presented below are taken from Jena Ra’icha Ralámuli Alué ‘Ya Muchígame Chiquime Níliga. Aquí relata la gente de antes lo que pasaba en su tiempo, collected by Albino Mares Trias (1975). It is a collection of stories in Tarahumara, given parallel with a Spanish translation. The Spanish was used initially to find instances of RUN corresponding to Spanish correr, and to get a general idea of the Tarahumara meaning. Translations below, though, are from the Tarahumara with heavy consultation from Thord-Gray. Note that Tarahumara does not have a well-established
orthography, and so the Thord-Gray forms and the forms used by Mares Trias in the storybook do not correspond exactly. To help alleviate this the forms corresponding to RUN will be put into boldface type.


\[
\begin{align*}
past & \quad 3.s \quad run \quad he \quad dem. \\
\end{align*}
\]

When the wind blew he ran for the path.

(2) Cha *maja’ligame* ‘lige alue’ rioca ‘lige alue’ ba’hui’

\[
\begin{align*}
evill & \quad run-away-past \quad dem. \\
\end{align*}
\]

He ran away because he was afraid.

(3) *Majame* came ‘lige alue’ ba’sui’ ale’ ili’game.

\[
\begin{align*}
run & \quad past \quad dem. \\
\end{align*}
\]

He ran away from the bull.

(4) Pe ra-‘name ani’leque’e mim *mejca’*

\[
\begin{align*}
\text{little thunder sound-rep.} & \quad to \quad run \\
\end{align*}
\]

A little thunder ran to there.

(5) Tabile’ ‘me hue *majale’game* ni’leque’e alue’ aja’game jami oyame.

\[
\begin{align*}
negative & \quad 3.s \quad run-away-past \quad sound-rep. \\
\end{align*}
\]
He did not run from chasing animals.

(1) is given as an example of a basic, physical use of RUN. A man moves himself quickly to a goal as part of the SOURCE-PATH-GOAL schema. (2) and (3) are similar, differing only in the described direction of the actor’s motion.

(4) is a bit different. It shows that in Tarahumara, RUN and presumably other basic motion verbs can take personified inanimate concepts as subjects. In this specific case thunder is approaching an area quickly, with the motion described with RUN.

(5) is again a bit different. It describes a person’s lack of fear as a lack of running away. This serves as an example, outside of the dictionary definitions of Thord-Gray, that Tarahumara RUN can not only take personified subjects but can also be used in a non-physical, metaphorical sense. Although this example may actually describe the physical state of not running, the lack of fear involved is metaphorical.

The use of RUN in Tarahumara, from the limited printed corpus, is not extraordinary. The corpus, given its simple storybook nature, does not attest to all of the uses listed in Thord-Gray, but does seem to exemplify some of the suffixed definitions (although without the use of the listed suffixes).

The constructions in which Tarahumara RUN occurs in the corpus investigated can be generalized to one form:

(6) S RUN (PP)
where S is an intransitive subject and PP is an optional prepositional phrase. The prepositional phrase refers to either the source or goal of a SOURCE-PATH-GOAL schema.

Considering both the definitions given by Thord-Gray and the uses found in the corpus, Tarahumara RUN can be described with the following radial structure in Figure 1:

---

**Figure 1**

The central, prototypical use is the simple physical motion sense. Two paths of the radial structure branch out from this center. One path is still generally a physical motion sense, but as part of the SOURCE-PATH-GOAL schema rather than simple motion as with the center of the structure. This path has two additional branches; one branch signifies fleeing...
or running from a source, while the other signifies chasing, or running to a point. Additional figurative uses are also included in this branch.

The second path branching out from the center is labeled as “other”. This is not to say that the uses therein are not part of a SOURCE-PATH-GOAL schema, but because they were not attested in the corpus used. This branch includes three of Thord-Gray’s definitions: gad/wander, flirt, and “walk the streets of the pueblo”. Without finding attested examples of these in the corpus or otherwise having the requisite knowledge of Tarahumara, one cannot be intimate with their use. However, one possible explanation would place them in a similar vein of use as the English construction

(7) S go out with SB

where S is the subject of the sentence and SB is the target of the preposition “with”. In cases such as (7), a basic motion verb is used to indicate general activity on the part of the subject. The Tarahumara construction may be equivalent but just happen to use RUN instead of another motion verb such as GO.

IV. Basque Data

Basque has two basic words which can express RUN: korrika egin and lasterka egin. Examples of use and dictionary definitions of both are given below. In order to express
some of the more idiomatic English uses of RUN, Basque has separate verbs. Examples from Aulestia and White (1992) include:

topo egin, tupust egin, topatu, jo – run into
enkailatu – run aground
alde egin, ihes egin, hanka egin, ospa egin – run away/flee
eskastu, urritu, murriztu, bakandu – run out of (resources)

The corpus from which the examples of actual use are taken is the online Euskara Corpusa (Basque Corpus), a generalized corpus of Basque with data from 1900 to 1999.

**Korrika egin**

Aulestia and White (1992) give the definition of *korrika egin*, the infinitive of *korrika*, as “to run, to race”. *Korrika* has no other commonly listed definitions as a verb and has predictable noun definitions directly related to RUN. The corpus has 265 occurrences in 4,658,036 words, some of which are given below.

(1) Eta horregatik zoazte korrika?

and why go.2s run

And that is why you are going running?
This represents a straightforward, literal use of RUN. *Korrika* is used to denote physical motion and there is no real sense of metaphor in (1).

(2) Edgar korrika etorri zen "Zikin"en atzetik.

    Edgar  run       came  3s.past “dirty” behind.in

Edgar came running, dirty in the behind.

This is a mostly physical use of RUN, as part of a SOURCE-PATH-GOAL schema. In (2), Edgar is running from an unknown source to a defined goal (the location of the speaker).

(3) Gero korrika joan zen Uliren gurasoei telefonoz abisatzera.

    Then run       go     3s.past Uliren parents-dat. telephone-in warn

Then Uliren ran to the phone to warn the parents.

Here is another straightforward use of *korrika*. A person is moving toward a location for a specific purpose. (3) could be said to have two goals as part of a SOURCE-PATH-GOAL metaphor, one physical and one intentional. The physical goal is to reach the phone, but Uliren’s intention is to warn the parents.

(4) Korrika irten zen hau aitaren txabolatik.

    run       out  3s.past this father’s shack-abl.

This was running out of his father’s shack.
(4) uses RUN as part of SOURCE-PATH-GOAL, with the source well-defined as a shack. As mentioned above, although RUN OUT is used here, it does not denote exhaustion of a resource. Basque has different forms to express such an idiom without the use of RUN, such as eskastu.

(5) Ur jostalaria korrika eta saltoka zebilen hondarra eta harritxoaren artean.
water.abs playful-adv. run and jump struggling sand and stones between
The water is playfully running and jumping and struggling between the sand.

Given the English translation, it would be easy to mistake (5) as a use of RUN as “flow”. Running water is a common English idiom. In this case, though, it would be better to interpret (5) as a use of RUN as fast physical motion, but with an inanimate, personified actor. Some clues to this are the co-occurrence with “jumping and struggling”, and that RUN is not elsewhere used to mean “flow” in Basque.

*Korrika egin*, like Tarahumara RUN, can be generalized to one form:

(6) S RUN (PP)

where S is an intransitive subject and PP is an optional prepositional phrase. The prepositional phrase refers to either the source or goal of a SOURCE-PATH-GOAL schema.
Basque *korrika egin* can be described with the following radial structure in Figure 2a:

![Radial Structure Diagram]

Figure 2a

The center of the structure is the plain physical sense of RUN, without a SOURCE-PATH-GOAL schema explicitly stated. This is a fairly simple structure, as it branches only once to SOURCE-PATH-GOAL schematic uses. These uses further branch into fleeing and chasing, as did Tarahumara RUN. Additionally, the figurative uses indicated by (5) are described in the radial structure, although they are included in the central grouping.

**Lasterka egin**
Aulestia and White (1992) have a much larger list of definitions for *lasterka egin* and related words as compared to *korrika egin*.

*lasterka egin* – to run, to race
*laster* – soon, quickly, fast, active industrious, quick, fast, hasty
*lasterbide* – shortcut
*lasterdura* – haste, hastiness, hurry
*laster egin* – to do (something) quickly, to hurry, to rush, to run
*lasterka* – hurriedly, in a rush, race, run
*lesterkaldi* – race, period of running, galloping
*lasterkari* – racer, runner, quick, fast, agile
*lasterkatu* – to hurry, to rush, to run, to race
*lasterketa* – race, run
*lasterrari* – runner, racer
*lasterreri* – diarrhea, dysentery
*lastertasun* – quickness, promptness, speed
*lastertu* – to rush, to hurry, to run

In the 4,658,036 words of the Euskara Corpusa, *lasterka* occurs 186 times. Some of these are given below.

(7) Igerian, bai, ederki daki; baina, lurraen korrika, lasterka, ez. swimming yes well know.1sg but ground.iness. run, run, not
Swimming, yes, I know very well; but on the ground, running (korrika), running (lasterka) I do not.

Here *korrika egin* and *lasterka egin* are used together in the same sentence. In opposition to an aquatic activity, swimming, they both denote an athletic pursuit on solid ground.

(8) Haurrak, bitartean, hor behean, aurrera eta atzera lasterka.

children-abs while where below from and back run

At the same time, below, the children are running back and forth.

*Lasterka egin* is on its own here. It could be interpreted as either describing simple motion, or something more idiomatic if *lasterka* were to be translated in the rushing sense instead of as RUN.

(9) Benek ikusi zuenean, lasterka berarengana joan nahi izan zuen.

Ben-erg see when run him.distal go to be 3s.past

Ben saw him; he went running to him.

Here *lasterka* is part of a SOURCE-PATH-GOAL schema. An actor wishes to move towards a person. The person is the goal of the schema.

(10) Errege jauna, huna gizon baturrunean lasterka heldu.

King (salutation).abs emotionally man.abs a distance run reach
Mr. King, emotionally gets a man to run the distance.

Through context it appears that the Mr. King referred to is Don King, the boxing promoter. Since boxers rarely actually run in the ring, it seems likely that RUN here is used as part of a metaphor. (10) is another example of the SOURCE-PATH-GOAL schema, although in this case the motion is not at all physical, unlike (9). The goal here is perhaps winning a boxing match, and “running” to the goal could be a way of expressing its achievement. The “distance” could be considered part of the PATH in the schema. English has a similar idiom without RUN, namely “go the distance” to mean last until the end of a competition or other activity.

(11) Jutterly botuak zenbatzen ari ziren udaletxera itzuli zen lasterka.
judicial votes counting-in were town hall back 3sg.past quickly.
Judicial vote counts were quickly being returned to the city council.

Here is an example of lasterka as an adverb. (11) could be considered a use of the “hurry” metaphor. Such a use of the metaphor gives a sense of urgency to the political election, and agrees with the common English metaphor of a political “race”.

Lasterka egin can also be generalized to (6).

Lasterka egin can be described with the following radial structure in Figure 2b, constructed using both the dictionary definitions and the uses found in the Euskara
Corpusa:

Figure 2b

At the central level, *lasterka egin* describes basic physical motion, like other forms of RUN investigated so far. From the center it splits into two main branches, as did Tarahumara. The first branch is still describing strictly physical motion but is part of the SOURCE-PATH-GOAL schema, unlike the central use. This branch would include examples such as (9) and (10), in which *lasterka* is used to denote a metaphorical rather than physical race.

The second branch splitting from the center is the non-SOURCE-PATH-GOAL branch. Uses of RUN indicating definitions such as “rush” or “hurry” fit under this branch. Examples include some of the dictionary definitions, as well as (7). Figure 2c
below generalizes both terms for Basque RUN and puts them in the same radial structure, yielding a similar structure to Tarahumara.

Figure 2c

I. English Data

Of Tarahumara, English, and Basque, English is much more productive with its use of RUN. Other than the animate, physical motion use of RUN, English RUN has extensive metaphorical uses that are very engrained in the language. These are catalogued and briefly discussed below. The examples are taken from the Corpus of Contemporary American English (COCA).
(1) I try to run 10 kilometers every day with a colleague of mine. 
This is an example of a simple animate and physical use of RUN. Some person covers a 
physical distance at a fairly quick pace. RUN is irrespective of the distance covered or the 
path, and partially respective of the pace at which the motion takes place.

(2) My refrigerator seems to run constantly. 
This use of RUN is metaphoric. The refrigerator in question is not moving across a 
physical distance at any pace. However, it is performing some task that can be 
metaphorically described with RUN. RUN describes an act with intensity above that of 
sitting still. When a refrigerator is running, the activity level of its motors is above its 
resting level. This extra effort could be seen, metaphorically, as akin to the extra effort 
put into the act of running. Hence, the refrigerator is running when its motor is audibly 
exerting extra effort. Senses of RUN such as (2) could be described as iterative, where 
some process is repeatedly being performed. In this case the process involves the 
increased activity level.

(3) I’ve spent the whole day running around after the kids. 
In (3) RUN denotes pursuit. This specific case could be interpreted as a literal, possibly 
exaggerated use or as a metaphorical use. In the literal case, the subject is pursuing 
children who are presumably attempting to not be caught (this likely does not take all 
day, however energetic the children may be). In the metaphorical case, which is fairly 
similar, the subject is again pursuing the children but not necessarily physically. Instead,
the subject is attempting to not fall behind the point where she loses track of the 
children’s activities, so is chasing after a position of knowledge rather than a physical 
position (although they may intersect in this instance).

(4) Don’t run away from the animals.
Here RUN is used to denote fleeing. As part of a SOURCE-PATH-GOAL schema, the 
animals are a source while some point away from the animals is a goal.

(5) We have Democrats running from their own damn record and this is atrocious 
enough!
This is much like (4), except that there is no physical motion but rather metaphorical 
motion. Democrats, presumably afraid of their political record, are fleeing from said 
record. Rather than trying to physically run away and put distance between themselves 
and the record, they are putting ideological distance between themselves and the record. 
Instead of physical maneuvering there is political maneuvering.

(6) Who does not run after Fortune.
In this case RUN is again used to denote pursuit, albeit metaphorically. The relationship 
between (3) and (6) is much the same as that between (4) and (5). Here the motion 
referred to is a metaphorical attempt to get oneself closer to the attainment of an ideal, in 
this case Fortune.

(7) A woman ran a stroller into the back of my legs.
Here RUN signifies a meeting of objects. In (7), a woman causes a stroller to collide with someone else’s legs. Unlike the previous uses, though, on the surface RUN is being used transitively. This could be accounted for as an instance of the caused motion construction, which enables intransitive verbs to take an object. In this case, the subject is performing an action described by RUN. In performing the action, an object is caused to move. Although RUN in a strict locomotion sense does not take an object, the caused motion construction allows examples such as (7). Additionally, (7) is another instance of run being used with the SOURCE-PATH-GOAL schema.

(8) The Mukuvisi River runs from east to west across Harare.

This instance of RUN could conceivably be interpreted in two different ways. One way is the use of RUN to mean flow of a liquid or other mass. This is seen in other situations such as colors “running” during clothes washing, and not strictly with liquid. Another possible interpretation of (8), though, is as fictive motion of the path of the river, rather than the literal motion of the water contained in the river. Briefly, fictive motion is metaphorical motion through space of a stationary object; for example, a fence or road can describe a path across a countryside and be said to move through the countryside, although they themselves are stationary. The path of the Mukuvisi River can be traced across Harare, much as a fence or road could be. In the case of a river, including a directional phrase has very heavy implications as to the flow direction also. Given (9), one would not likely assume that the river flows west to east, even interpreting this as purely fictive motion.
(9) Here, the fence runs closely between the West Bank and Israel. The motion of the fence here, unlike the river, is entirely fictive. The interpretation of (9) is only likely to be as fictive motion, with the motion describing in some way the path of the fence. In this case the location of the path is described, as opposed to a direction as one might see with a highway or river. That is, the fence is not described as going from one location to another, but rather as having an undefined path within a bounded area.

(10) In real life, the thick, dark fence line of the border runs more than 100 yards out into the Pacific ocean. This is also fictive motion, much like (9), but with at least one endpoint defined. It can be seen from (9) and (10) that English RUN as used in fictive motion does not need to have an endpoint of motion described. Additionally, although the endpoints do not need to be described, they can be.

(11) He ran a wire under the carpet. This is a slightly different case of fictive motion. Here, an actor places a wire which then describes a path via fictive motion. In a sense, then, the actor is causing the fictive motion. An alternative interpretation could be that there is not fictive motion and that RUN instead describes the motion the man takes in placing the wire in its described location, similar to the case of (7). However, it may be best to combine the two interpretations into a category of “caused fictive motion”. In (11), the wire runs under the carpet, which is fictive motion, but the fictive motion itself is caused by the subject’s actions. The subject’s actions, then, allow RUN to take an object in this case.
(12) Her husband of 44 years, Dave Meyers, runs the business side of the operation. The husband in (12) controls the business side of some operation, but instead of CONTROL, the verb used is RUN. Taken in conjunction with (7), it appears that RUN frequently is used to describe some kind of control. In (12), a man controls the path of a wire, whereas in (11) a man controls the business side of an operation. In both cases, he also “runs” the respective object. Going back to (7), a woman controls, or “runs” a stroller into the back of somebody’s legs. This specific example can be accounted for in the same way as (7), as a caused motion construction, but with the motion in (12) being metaphorical and without a source, path, or goal explicitly stated as part of a schema.

(13) A new photocopier will run us about $1300. Here an inanimate object is doing the controlling. In this case an amount of controlling is specified (monetarily). RUN in (13), though, does not take an object. Rather, an amount and a dative describing who the amount is taken from are specified. Because of this, (13) should be accounted for as an iterative use of RUN, as in (2). It cannot be considered a caused motion sense of run as it is not a transitive use.

(14) However, it seems that certain statistics take a really long time to run. RUN can be used to describe process implementation as well. A common English idiom of “running statistics” is used in (14). Of course the statistics are not actually in motion, but are rather being implemented, or in a sense controlled. One interpretation could be that there is an actor, controlling the statistics, as an analogue to the actors of (10), (11),
and (12) who were controlling the stroller, wire, and operation. This would have to be considered a caused motion use of run to account for the transitivity.

(15) Utah’s jobless claims run counter to U.S. drop

RUN in (15) is used in conjunction with a preposition to describe opposition to something. The context of this example is a newspaper headline on unemployment in the United States. Utah’s unemployment claims and the United States’ were changing at fairly different rates, so the headline writer described this opposition with RUN. The sense of opposition comes from the preposition, but the sense of metaphorical motion, i.e. of two unemployment rates moving at different speeds, comes from RUN. This could be explained as fictive motion through visualization of two curves describing the amounts of jobless claims, one growing in value through time and the other falling in value.

(16) We may run out of helium – and therefore helium-3 – before the fusion technology is even developed.

This example describes an exhaustion of a resource. There is an initial state of having helium, and a final state of having no helium. This use can be accounted for using the iterative sense of RUN seen in (2). Briefly, the actor in (16) has a source of helium. The actor is also performing an iterative process, which uses the helium as a resource. When the iterative process is performed a sufficient amount of times, the helium is used up and the actor has RUN out of helium.

(17) I have run out of patience.
The use of RUN in (17) is identical to that in (16), except that the resource is abstract instead of concrete. Here the initially possessed resource is patience, which is absent in the final state.

(18) The car runs on unleaded fuel.

RUN can refer to simple use of a resource as well, rather than exhaustion of the resource. (18) could be simply described as an iterative use of RUN similar to (16) and (17). In (18), though, the resource is not used to depletion.

The constructions in which English RUN occurs in the corpus investigated can be generalized to two forms:

(19) S RUN (PP)
(20) A RUN O (PP)

where S is an intransitive subject, A is a transitive agent, O is an object, and PP is an optional prepositional phrase. The prepositional phrase refers to either the source or goal of a SOURCE-PATH-GOAL schema.
The radial structure for RUN in English is given below in Figure 3:

Figure 3
The radial structure treats the plain physical sense of RUN as the central use. From the center three branches split off to SOURCE-PATH-GOAL uses, non-SOURCE-PATH-GOAL uses, and transitive uses. The SOURCE-PATH-GOAL uses include both fleeing and chasing, as well as literal uses such as (4) and metaphorical uses such as (6), and fictive motion.

The non-SOURCE-PATH-GOAL uses include the sense of hurrying seen in one of the interpretations of (3), as well as the iterative sense of RUN seen with the refrigerator in (2).
The transitive branch is one not seen in either Tarahumara or Basque. The transitive branch is made up of the caused motion instances of RUN such as (11). The transitive branch contains uses that could tentatively fit in one of the two other branches. However, they are importantly part of a caused motion construction. A SOURCE-PATH-GOAL example is (11), with caused fictive motion, while an iterative and non-SOURCE-PATH-GOAL example is (12), with simple control of a business but without a target explicitly stated.

II. Discussion

The diagrams of the radial structures allow for comparison between the uses of RUN in Tarahumara, Basque, and English. Although there are two distinct terms for RUN in Basque, the korrika egin structure is essentially a subset of the lasterka egin structure. Because of this, when the two Basque radial structures were combined, the resulting radial structure still has only two main branches from the center.

Perhaps the most evident information about RUN gained from the radial structures is that English is far more productive than either Basque or Tarahumara. Both Basque and Tarahumara have radial structures with two main branches from the center, while English has a radial structure with three main branches. As discussed earlier, the purpose of English in this investigation is to serve as a relative control to Basque and Tarahumara, having common ground with Tarahumara with respect to the treatment of subjects and
objects, and having common ground with Basque with respect to the influence of RUN on the culture of its speakers.

First looking at the differences between English and Basque RUN, other than the more productive use of RUN in English the most obvious differences lie in specific metaphorical uses. Tarahumara RUN is used to mean “gad”, “flirt” and “walk the streets of the pueblo”. Despite the productivity of English RUN, it does not have equivalent uses of the concept. As discussed in chapter III, this Tarahumara use may be equivalent to an English phrase such as “go out with someone”. Other than these uses, the metaphorical uses of RUN in Tarahumara seem unremarkable with respect to English, and the physical uses are generally the same. Importantly, though, whether or not these Tarahumara uses can be accounted for by culture should be discussed.

Tarahumara culture, as discussed in chapter III, has a very large importance placed on RUN or activities surrounding it. The Tarahumara run when persistence hunting. They run for communication and transportation between villages. They also run large distances for their competitions, the rarajipari and the dowerami. In most of the English-speaking world, although there are activities such as races of marathon distances (26.2 miles) and longer, and people also run for health reasons, RUN is not the same ubiquitous social activity for most of the population as it is in Tarahumara culture.

The Tarahumara uses of RUN in question all describe social activities. Chatting with someone, flirting with someone, and walking around town all involve interactions with other people and the community to some extent. It may be possible, then, that these uses of RUN are indeed influenced by sociocultural embodiment, in this case by a non-linguistic aspect of the culture. If this hypothesis is correct, the social nature of the
activity of running in Tarahumara culture has influenced the use of RUN in the Tarahumara language itself, to the extent that it has driven the development of certain metaphorical uses of RUN. Such a hypothesis would require further testing through experimentation or corpora to be validated.

Next, looking at the differences between English RUN and Basque RUN, English is again much more productive with its use of RUN. Given the differences between English and Basque morphosyntactic alignment, expected differences between these two languages would lie in the constructions in which their metaphors occur, and more specifically in what types of subjects and objects can be a part of these constructions. Indeed, English RUN can take an object while Basque RUN does not appear to do the same. Such a difference could plausibly be caused by the morphosyntactic alignments of the languages. Basque marks its intransitive subjects and its objects in the same manner, while English marks its transitive agents and intransitive subjects in the same manner. Because of this, English subjects and agents are not distinguished and thus it is easier for either to be used with a verb such as RUN. In this case, sociocultural embodiment could be affecting English RUN to include transitivity through its morphosyntactic alignment.

However, when comparing Tarahumara RUN and Basque RUN this does not appear to be the case. Tarahumara treats subjects and objects in the same way as English, yet it is more similar to Basque in the radial structure of RUN. Thus, it seems unlikely that morphosyntactic alignment has driven sociocultural embodiment in any of the cases investigated here. It is worth noting, though, that Basque does not have the same handful of socially-centered metaphorical uses of RUN found in Tarahumara, but rather a large set of uses related to hurrying, as does English.
One commonality between all three languages, is an element of control, or predictability, present when RUN is used. For the physical uses this is possibly due to the SOURCE-PATH-GOAL schema RUN is frequently a part of. When RUN is used in a SOURCE-PATH-GOAL schema, at least one of the three elements is specified, with another usually implied. For example, in

(1) Don’t run away from the animals.

a source, “animals” is given, with “away from” implying at least the existence of a path. Even a use such as

(2) I try to run 10 kilometers every day with a colleague of mine.

has a specified distance, which although not part of a SOURCE-PATH-GOAL schema still provides the element of predictability or telicity. In the absence of a distance, such as

(3) I try to run every day with a colleague of mine.

there is still an implication of distance covered which again provides an element of predictability. This predictability extends to the transitive uses of RUN in English, where rather than the agent’s movement at the focus of the predictability, the object’s path forced by the agent is at the focus of the predictability. In such a case the path may be explicit as in

(4) He ran a wire under the carpet.

or implicit as in

(5) Her husband of 44 years, Dave Meyers, runs the business side of the operation.

The element of predictability given by RUN, though, is common to all three languages, and thus should be considered more inherent to RUN, perhaps due to neurophysiological embodiment, than due to any kind of sociocultural embodiment.
III. Conclusion

In the discussion the possibility was raised that the Tarahumara cultural focus on RUN has to some extent driven the use of RUN in the Tarahumara language. There was also evidence that RUN was unaffected by morphosyntactic alignment in any of the languages investigated. Despite the lack of evidence for effects of morphosyntactic alignment, the possibility of sociocultural embodiment effects surrounding RUN in Tarahumara support the importance of the dogma of eliminative reductionism as described by Rohrer.

Although the results of this investigation may support it, though, the research here is hardly exhaustive and further research should be performed to draw stronger conclusions. One avenue for future research is to look further into the use of RUN in Tarahumara. There is very little available in the way of a Tarahumara corpus. Some audio recordings are in existence; it may be appropriate to transcribe these recordings, or to otherwise create a more significant corpus of Tarahumara in order to further investigate the possible sociocultural embodiment effect.

Additionally, given the possibility of sociocultural embodiment from the Tarahumara culture on RUN, further study may be appropriate as to the effects of expertise on use of basic motion verbs. RUN would again be a good candidate here, as there are those who make a living as athletes. In this case a more experimental study would likely be necessary, rather than a corpus study. For example, due to expertise in something such as
running, perhaps professional athletes of different types would have different boundaries for words such as run, walk, and jog, much as different languages have their own color boundaries.

It should also be noted that although only select words and their derivatives were investigated in each language, many words can be used to describe an instance of RUN. In English, other than “run” itself, these words include “jog”, “trot”, “hurry”, “sprint”, and others. In order to be a more complete study of RUN, further research should attempt to include other terms that denote RUN, whatever the language under investigation may be. Researching the clusters of words describing RUN instead of only run itself may reveal more about how RUN is used and would avoid incorrect conclusions being drawn from some triviality of the use of any individual word.

Whether or not further study in this vein is pursued, the danger of treating embodiment as a purely neurophysiological phenomenon should be avoided. Rohrer suggests that the best course of action may be “for cognitive linguists to reach out to the other cognitive sciences. If we set out to design collaborative research projects that are deliberately cross-methodological, we will no longer be forced to rely on evidence gathered from disparate traditions.” (Rohrer 2006) For the study of embodiment, this may mean taking converging evidence from different types of embodiment researched in different fields. A corpus investigation such as this may shed light on an instance of sociocultural embodiment, but to study the combined effects of sociocultural and physical embodiment a more elaborate study would be necessary; such a study would ideally include both experimental methods and corpus study of natural language.
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Online Corpora

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