



COLLOQUIA

Grading, gradients, degradation, grace

Part 1: Intensity and causality

Paul KOCKELMAN, *Yale University*

This article has two overarching and intertwined themes. The first is the social and semiotic mediation of “comparative grounds”—in particular, the way people come to understand, and alter, the relative intensity of entities and events. The second is the social and semiotic mediation of “causal grounds”—in particular, the way people come to understand, and alter, the sequencing of events, or the channeling of forces. Focusing on the multiple processes that mediate people’s understandings of landslides in a Mayan village in highland Guatemala, it shows the ways causal and comparative grounds relate to physical forces and phenomenological experience, as much as to communicative practices and social conventions. More generally, though less explicitly, this article is about four topics that underlie the Anthropocene: “gradients” (the way qualities vary in their intensity over space and time, and the ways such variations relate to causal processes), “grading” (the ways agents assess and alter such intensities, and experience and intervene in causal processes), “degradation” (the ways highly valuable variations in qualitative intensities are lowered or lost), and “grace” (the way agents work to maintain gradients, care for those whose lives have been degraded, and value those agents who work and care in such ways).

Keywords: causality, commensuration, intensity, grading, degradation, scale, landslides, Anthropocene

Let me begin with passages from two very different kinds of texts: (i) a thesis in geological engineering on the causes of landslides in settlements around Guatemala City; and (ii) a newspaper’s description of one such landslide, and some of its horrific effects.

- (i) The settlements are exposed to high landslide risk because they are located in very steep and large ravines made of weakly cemented pyroclastic deposits. In addition to the weak slope conditions, the



occurrence of landslides is further exacerbated by hurricanes, severe wet seasons, and earthquakes. There is significant vulnerability because the majority of the population in the settlements is in impoverished conditions with very low-income leading to poorly planned developments made of badly constructed structures that are frequently damaged by landslides. Families have typically migrated from rural areas to the urban settlements because they sought economic opportunities that are more apparent [there]. (Faber 2016: 1)

(ii) At least 220 bodies have been recovered after a massive landslide buried part of a town in Guatemala last week but about 350 people are still missing, the country's national disaster agency has announced. . . . Loosened by heavy rains, a hillside collapsed on to Santa Catarina Pinula on the south-eastern flank of Guatemala City on 1 October, burying more than 100 homes under tonnes of earth, rock and trees, and sparking a huge rescue effort. . . . Prosecutors in Guatemala said they are looking at whether there was any criminal misconduct at the site after Conred [the National Coordinator for the Reduction of Disasters] warned of the risks of building homes in the neighborhood, which lies at the bottom of a deep ravine. (*Guardian*, October 8, 2015)

These passages illustrate two key themes of this article. First, there is the social and semiotic mediation of “causal grounds”—in particular, the way people come to understand, and alter, the sequencing of events, or the channeling of forces. For example, apparent economic opportunities cause migration to urban settlements; low income leads to poorly planned developments; rains loosen hillsides; buried homes spark rescue efforts. Second, there is the social and semiotic mediation of “comparative grounds”—in particular, the way people come to understand, and alter, the relative intensity of entities and events: for example, what counts as a steep slope, a low income, a heavy rain, or a huge rescue effort.

This article is about the intertwining of such causal and comparative grounds. Focusing on the multiple processes that mediate people's understandings of landslides in a Mayan village in highland Guatemala, it shows the ways these grounds relate to physical forces and phenomenological experiences, as much as to communicative practices and social conventions. And, as intimated by these examples, it highlights the political, economic, affective and ecological stakes at play in such forms of mediation.

Framed another way, which should foreground the relation between such field-site-specific themes and the global Anthropocene, as a particularly timely locus of more general anthropological concern, this article is about “gradients” (the way qualities vary in their intensity over space and time, and the ways such variations relate to causal processes), “grading” (the ways agents assess and alter such intensities, and experience and intervene in causal processes), “degradation” (the ways highly valuable variations in qualitative intensities are lowered or lost), and “grace” (the way agents work to maintain gradients, care for those whose lives have been degraded, and value those agents who work and care in such ways).¹

1. See the particularly stimulating work of Smail (2008), Chakrabarty (2009), and Tomlinson (2015).

Part 1 of this article will focus on comparative and causal grounds; part 2, which will appear in the next issue of this journal, will focus on phenomenological and material grounds.

Comparative grounds

To understand grading as a communicative practice, it is helpful to begin with a simple example. An explicitly comparative utterance like “this hillside is a little steeper than that hillside” has five key components (see fig. 1): (a) dimension in comparison (steepness), (b) a figure of comparison (this hillside), (c) a ground of comparison (that hillside), (d) a direction of comparison (greater than), and (e) a magnitude of comparison (a little).

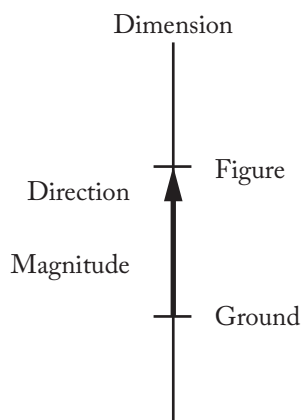


Figure 1: Some key components of explicit comparative constructions.

Such an utterance presumes not only that the dimension applies to both the figure and the ground, but also that both such entities can vary in regard to their degree of that dimension. And it proposes that the figure has a little more, or a slightly greater degree, of the dimension in question than the ground.

Each of these five components can vary independently within certain limits. For example, the dimension could be changed from steepness to muddiness, to exposedness or expensiveness, to barrenness or riskiness. Indeed, it could be changed to most other gradable predicates in the language, insofar as they can apply to the figure and ground in question. If we were talking about people rather than hill-sides, it could turn on dimensions like height, weight, strength, trustworthiness, speed, suavity, and so forth. Indeed, the predicate *degradation* is gradable (“this environment is more degraded than that one”), as is the predicate *graceful* (“her dance was less graceful than his”); so there is a recursive applicability of the categories dealt with in this article. What really matters is that the figure and ground are commensurate, in the sense that the predicate is applicable to both of them, even if they differ in regard to their respective degrees of the dimension referred to by that predicate.

Relatively speaking, the figure is that entity whose degree (along some dimension) is being graded; and the ground is that entity whose degree (along the same dimension) is being used to grade. Any two entities, events, or ideas could fill these slots depending on the dimension in question (“John is taller than Michael Jordan,” “My mother’s brother is stronger than your mother’s brother,” and so forth). What often matters is that the ground’s degree of the dimension in question (say, steepness or height) is being more or less taken for granted (constituting relatively old information, or immediate knowledge, that the speaker can assume the addressee already has access to); whereas the figure’s degree of the dimension in question is being more or less proposed (constituting new information, or mediate knowledge, that the speaker is informing the addressee of). Complications concerning this issue will be discussed below.

In this example, the direction of comparison is marked with the degree morpheme (-er), indicating that the figure exhibits a greater degree of the dimension than the ground. While this is probably the unmarked situation, there are a range of other possibilities. For example, not just “more steep” versus “less steep” (where the latter construction inverts the direction of comparison), but also constructions which indicate similarity in grade (“as steep as,” “no steeper than,” “nearly as steep as”), and much else beside.²

Without an explicitly expressed magnitude, all we learn from such constructions is that the figure has a greater degree of the dimension than the ground; but how much more is left relatively unspecified. For example, the judgment “this is heavier than that” is true if the objects being compared weigh 10,000 pounds and one pound, respectively; or if they weigh 1.001 pounds and 1.000 pounds; or if they weigh 10 micrograms and one microgram. Comparative constructions tend to be scale-independent, like most grammatical categories (Talmy 2000).³ That said, we can indicate the magnitude of difference in relatively precise ways if needed (“this is 10 pounds heavier than that”), or in relatively imprecise—but usually more than adequate—ways (“this is much heavier than that,” “this is a little bit heavier than that,” “this is almost as heavy as that,” etc.).

As is well known, for a wide range of dimensions a relatively standardized “metric” may be imposed, such that one can explicitly quantify the degree to which some figure exhibits that dimension (see fig. 2).

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2. For reasons of space, I am not taking up several key questions here: the existence of different classes of predicates (or different domains of qualities) which: have upper and lower bounds on their dimensions; project extreme degrees; have discretized as opposed to continuous dimensions; are not open to grading in the first place, and so forth. Note also that nouns can be graded through their predicates: what counts as “big data” versus “small data”; what counts as “large scale” versus “small scale,” “thick description” versus “thin description,” “deep history” versus “shallow history,” and so forth.
 3. Kockelman (2006, 2009, 2010b, 2013, 2016) and Kockelman and Bernstein (2012) take up scale, degrees, dimensions, and frames as interrelated analytic concepts.

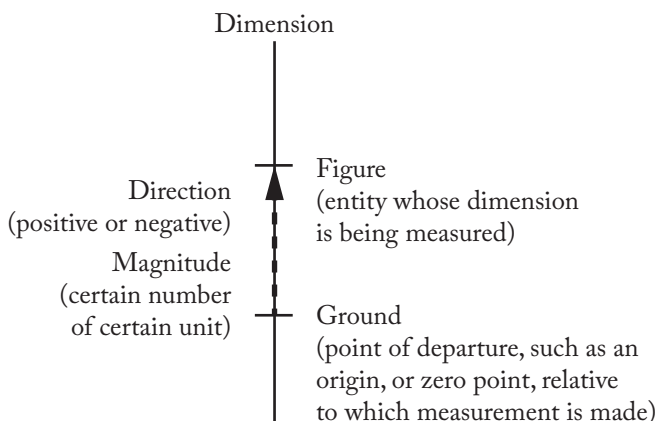


Figure 2: Some key components of explicit quantification constructions.

I will follow Sapir ([1944] 1985) in assuming that quantification of this more stereotypic variety presupposes grading—not just the explicit modes of comparison just discussed, but also the implicit modes of comparison to be discussed below.⁴

Indeed, it should also be realized that, even when a dimension has been subject to explicit measurement, implicit grading still takes over. For example, it matters less that some basketball player is 7'4", than that "that's really tall [in comparison to the average height of other basketball players]." Similarly, it matters less that the hillside has a slope of 40 degrees, than that "that's too steep [given the risks of landslides]." Indeed, to return to our opening example, while some might argue that certain numbers—say, 220 bodies uncovered from the mud, or 350 people still missing in the wake of a disaster—are inherently impressive (or, indeed, absolutely horrific), others might argue that what really matters to a "comparative public" is what counts as "a lot" of bodies, or "too many" missing people, for that public. Such inherently comparative judgments are socially and historically grounded in norms of intensity and sensitivity; and it is usually only in reference to such norms that issues like causal reckoning, affective relating, narrative recounting, and moral accounting proceed.

* * *

Although these examples are taken from English, this general framework and the points made in the ensuing discussion apply to a wide range of grammatical constructions, in a wide range of languages, used by a wide range of communities (publics, etc.), so long as one takes into account the different morphosyntactic strategies, semantic resources, and pragmatic implications that underlie the encoding of the components in question. Take, for example, a comparative utterance in Q'eqchi' (Maya), a language spoken in Guatemala by around one million people, many of whom are severely affected by landslides:

4. Thinkers since Aristotle have been attuned to the processes through which various dimensions come to be made socially significant, and come to be quantified in standardized ways (not just exchange value, or price, but also population, GDP, and IQ). See Kockelman (2006) and Kockelman and Bernstein (2012).

*q'ès-q'ès l-in ch'iich' chi-r-u l-aa ch'iich*⁵
 sharp-sharp Dm-E(1s) machete Prep-E(3s)-face Dm-E(2s) machete⁶
 “my machete is very sharp in comparison to your machete”

Again we have something like a figure of comparison (my machete), a ground of comparison (your machete), a dimension in comparison (sharpness), a direction of comparison (greater), and a magnitude of comparison (very). Here, however, the direction of comparison is marked not by a morpheme like *-er*, but rather through the relative positioning of the arguments in the construction itself. In particular, “my machete” is the argument of the reduplicated adjectival predicate, *q'ès-q'ès*; “your machete” is the argument of the nonobligatory adposition, *chiru*. (We will return to the relation between steepness and sharpness in part 2.)

Indeed, Q'eqchi' has no direct equivalent of English “less than.” To encode such a direction, one must switch the relative syntactic positioning of the arguments, or use the inverse (or antonym) of the dimension in comparison (when possible). For example, instead of saying “my machete is less sharp than your machete,” one says the Q'eqchi' equivalent of: “your machete is more sharp than my machete” (swap arguments) or “my machete is duller than your machete” (invert predicate). And, as in English, both such strategies have semantic and pragmatic implications that the original sentence would not have had, and so they are decidedly nonequivalent, even if they might count in a pinch as possible translations.

Moreover, the magnitude of comparison is marked not by a degree adverb like English “a little,” but rather through reduplication of the predicate referring to the dimension in comparison. But it could be. For example, Q'eqchi' speakers can use *mas* (< Spanish *más*) as opposed to reduplication to mean more or less (!) the same thing as English “very” (or Spanish *muy*); and they can use *jwal* as opposed to *mas* to mean more or less the same thing as English reduplicated “very very.”

Here is an example of metalanguage in which a speaker paraphrases the meaning of *jwal* (qua “figure of translation”) using the meaning of *mas* (qua “ground of translation”):

jwal t-Ø-in-rahi raj li tzekemj o sea, mas mas t-Ø-in-rahi raj li tzekemj aàn
 really Fut-A(3s)-E(1s)-want CF Dm food or in_other_words very very
 Fut-A(3s)-E(1s) want CF Dm food Pro(3s)
 “I would *really* like the food, in other words, I would *very very* much like that food”

5. In Q'eqchi', vowel length (signaled by doubling letters) is phonemic. /k/ and /q/ are velar and uvular plosives, respectively; /x/ and /j/ are palato-alveolar and velar fricatives, respectively.
6. Here are the transcription conventions used in interlinear glosses: **E(1s)** ergative case, first-person singular (and similarly, for other combinations); **A(2p)** absolutive case, second-person plural (and similarly, for other combinations); **Dm** determiner; **CF** counterfactual; **Nom** nominalizer; **SD** status designator; **Comp** complementizer; **Interj** interjection; **Prep** preposition; **RN** relational noun; **Fut** future tense; **Pro** pronoun; **Neg** negative; **Hor** hortative; **Tpc** topic; **Rflx** reflexive.

Reduplicated predicates seem to be “diagrammatic icons” of intensity and often seem to correlate with experiential proximity. Interestingly, *jwal* is often substituted for *mas* in dictionary examples—even though it upgrades, or increases the degree of, the dimension at issue. That is, in attempting to make the language “more pure” (or “less Spanish-like”), authors of such language standards unconsciously make all examples of implicit comparative constructions, whatever the dimension, more intense: for example, *mas tiq* “very hot” → *jwal tiq* “very very hot.” Such examples portray speakers of the language as highly impressionable, or sensitive. Conversely, if this attempt at standardization succeeds, the meaning of *jwal*, the relative magnitude it denotes, may be made less intense over time. Note, then, the complicated relation between metalanguage (dictionaries, for example), linguistic standardization, and language purity insofar as affect (sensibility), semantic change, and intensity (grade) get coupled in unintended and potentially consequential ways.

Finally, the comparative construction itself turns on the adposition *chiru*, which literally means “in the face of,” but which is perhaps best translated as “in comparison to,” or even “in confrontation with.” And just as the comparative clause in English is usually nonobligatory (one can simply say, “this hillside is a little steeper”), so too is the adpositional phrase in Q’eqchi’. One can simply say, *q’eqq’eq lin ch’iich’*, or “my machete is very sharp.” In such constructions, the comparative ground is left implicit; and so must be inferred from other aspects of the utterance’s content, or the context in which it is uttered.

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We will now highlight the ways such “implicit comparative grounds” shift across context, the manner in which they are reflexively gauged, the social relations that get mediated through their usage, and the cultural assumptions they both evince and establish. In his “Categories,” Aristotle contrasts quantity with relation, which were two important categories within his larger system: substance, quality, quantity, relation, place, time, position, state, action, affection.

Things are not great or small absolutely, they are so called rather as the result of an act of comparison. For instance, a mountain is called small, a grain large, in virtue of the fact that the latter is greater than others of its kind, the former less. Thus there is a reference here to an external standard, for if the terms “great” and “small” were used absolutely, a mountain would never be called small or a grain large. Again, we say that there are many people in a village, and few in Athens, although those in the city are many times as numerous as those in the village; or we say that a house has many in it, and a theatre few, though those in the theatre far outnumber those in the house. The terms “two cubits long,” “three cubits long,” and so on indicate quantity, the terms “great” and “small” indicate relation, for they have reference to an external standard. (Aristotle 2001: 16)

As is well known, Aristotle’s category of quality relates to his category of substance as predicates relate to subjects, or adjectives relate to nouns. These two categories are on display not just in utterances like “Socrates is wise” and “the stove is black,” but also in utterances like “the rains were heavy” and “the ravine was deep.” For Aristotle, a key feature of most qualities and many relations, as opposed to

substances, was that they admitted of degrees, or variations in intensity. As he put it, “that which is beautiful may be more or less beautiful than some other beautiful object” (and similarly for words like “great” and “small,” “many” and “few,” “deep” and “heavy,” “risky” and “complicated”).

Given the kinds of evidence that Aristotle used to justify his system, which seem to have been based on his intuitions as to the relative grammaticality of various construction types in ancient Greek, it may be argued that he was unconsciously projecting the relatively “covert grammatical categories” of his native language onto the world itself as a kind of fundamental ontology. Such an ontology has long bedeviled philosophers, so many of whom seem to have been unaware of its linguistic origins, or its semiotic and social implications (Whorf [1939] 1993; Sapir [1944] 1985; Benveniste [1958] 1971). Note, then, that we don’t want to read too much off of the superficial formal structure of the English examples, or make too much of Aristotle’s ontology. As we saw above, Q’eqchi’ speakers do things somewhat differently.

Such linguistic and philosophical issues aside, what is of immediate interest here is Aristotle’s discussion of the content-specificity of comparative grounds, insofar as they “make reference to an external standard” and “admit of various degrees.” In particular, while grounds of comparison can be relatively explicit (“Socrates is wiser *than Plato*,” “the rains were heavier *than they have been in years*”), most grounds are relatively implicit. For example, when I say, “this is steep” (as opposed to “this is steeper than that”), what I am really saying is something like “this has more degrees of the dimension in question than the typical member of the class of entities with which it is being compared” (i.e., the external standard, or implicit ground of comparison). Moreover, what is steep in the context of rock climbing is different than what is steep in the context of hiking, or steep in the context of house building (not to mention what is steep in the context of price). These key ideas, inaugurated by Aristotle, echoed by Kant ([1790] 2000), radically extended by Sapir ([1944] 1984), who called them “points of departure,” and empirically supported by recent work in the semantics of grading (Bollinger 1972; Klein 1980; Kennedy and McNally 2005), have many implications for anthropology and social theory more generally (Kockelman 2016a).⁷

For example, whenever we predicate a feature of an entity, we are not just presuming a class of relatively commensurable entities to which that entity can be compared (insofar as they may be said to have the same dimension, or “quality,” as the entity in question); we are also presuming a normal, average, or typical degree of the dimension associated with those entities. In other words, simply to describe something as “steep,” “risky,” “small-scale,” or “horrific” (not to mention “great” or “numerous,” “hot” or “heavy”) usually presumes something like an aggregate or class and something like an average or norm. The folk notion, dear to so many social scientists of an ethnographic persuasion, that quality is prior to quantity, or that the individual case is prior to the general class, is radically misleading. Rather, comparative grounds, with their assessment of some dimension’s relative degree, or comparative intensity, are presupposed by “quality” as much as by “quantity.”

7. See also the particularly important work of Carruthers (2016, in press).

Aristotle emphasized the content-specificity of comparative grounds: what is heavy for a star may be very different than what is heavy for a train, or heavy for a cellphone. While unremarked upon by Aristotle, such contents are themselves often context-specific. For example, when I say, “the rains were heavy,” you don’t just need to know that I am talking about rains (as opposed to cellphones, stars, or trains); you also need to know what counts as a heavy rain around here, for people like us, engaged in an activity like this, given recent events and future plans as much as past experience. For without that information you cannot establish the comparison class, and thus have no sense of the typical degree or intensity in question. In some sense, then, words like “heavy” and “horrific” are shifters, just as words like “here,” “us,” “this,” “recent,” “future,” and “past.”⁸

Such context-specificity means that comparative grounds are only sometimes constituted by “standards of reference.” All that really matters is that they may be taken for granted in some communicative encounter, insofar as they are treated as being (more or less) shared among members of a (larger or smaller) collectivity for (longer or shorter) stretches of time.⁹ Such relatively shared grounds may be “grounded in” phenomenal knowledge (what we both have experiential access to in the speech event), discursive knowledge (what we both know from prior conversations), cultural knowledge (what people who grew up around here can take for granted), and so forth (see fig. 3).

q'és-q'és li-n ch'iich' chi-r-u l-aa ch'iich'
 Rdpl-sharp Dm-E(1s)-machete Prep-E(3s)-RN Dm machete
 “my machete is very sharp in comparison to your machete”

Fig. = Figure of Comparison (my machete, NP)
Gnd. = Ground of Comparison (your machete, NP)
Dim. = Dimension in Comparison (sharpness, Adj)
Dir. = Direction of Comparison (greater, AdPos)
Mag. = Magnitude of Comparison (very, reduplication)

Related to Aspect (Adapting and Adjusting Jakobson 1990b)

Fig. => Eⁿ (or ‘narrated entity’)
Gnd. => E^r (or ‘reference entity’, ‘point of departure’)
Dim., Dir., Mag. => / (or ‘relation between Eⁿ and E^r’)
 Where E^r can be identified via entities in speech event (E^s), other narrated events (Eⁿ), conventional knowledge about entities (E^c), and so forth. Note, then, just as the Eⁿ/E^r relation is critical, so too is the E^r/E^s relation—that is, how E^r gets established in terms of E^s, or establishes the terms of E^s.

Figure 3: Relation to Jakobson’s sense of shifter.

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8. For more on shifters, and their centrality to linguistics, anthropology, and philosophy, see Silverstein (1976), Jakobson (1990), Lucy (1993), and Lee (1997).
9. Such grounds thereby constitute a kind of commons, in particular a commons of qualia and quantia, or a commons of commensuration (and causality), that is oriented to by a particular collectivity.

And so they might be shared only by two intimate friends, as salient for a single afternoon, insofar as they shared the same experience; or they might be known by all members of a nation-state, for more than a century, insofar as they learned the same history, or lived in the same environment.

In other words, such comparative grounds are not only context- and content-specific in these ways, they are also experientially and historically specific. What counted as fast for my parents may count as slow for me. What counted as very entertaining for my grandparents may count as barely entertaining for me. What counted as sad when I was depressed may count as funny when I'm elated. Such comparative grounds—which turn on habits, capacities, and experiences of personal bodies as much as the standards and conventions of body politics—are key tools for teasing out the grounds of experience and, in particular, transformations in such grounds over time.¹⁰

In short, *pace* Aristotle, many “external standards”—or, rather, grounds of comparison—are not standardized at all, and so may turn on singular grounds as much as typical ones, private grounds as much as public ones, fleeting grounds as much as lasting ones, contentious grounds as much as uncontroversial ones.

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Let's exemplify and go beyond these issues by returning to that thesis on small-scale landslides:

The purpose of this research is to develop a landslide-risk-rating-system (LRRS) that can be used by trained residents to better understand their risk. . . . The focus of this LRRS is only on small-scale landslides (typically the size of a house or less) because evaluating the risk of large-scale landslides is too complicated to be done by trained non-technical experts. The LRRS asks questions related to landslide risk that can be used to

10. Crucially, what counts as the comparative ground in such cases (relative to which another experience is figured as evincing more or less of some quality) is often the intensity of the experience where we just were (so to speak). For example, as I moved, a process which occurs in time, I went from a place with one intensity to a place with another intensity, and I may only notice the second intensity relative to the ground of the first intensity. What I am experiencing now is more (or less) intense than what I was experiencing before; and so I should retreat (for it is too intense), stay (for it seems just right), push further (to increase it even more), and so forth. Recursively, the intensity experienced at the second place and time can go on to become the ground of comparison for the intensity to be experienced at a latter place and time. Grounds of comparison, then, are often best understood processionally, as subjective and intersubjective flows, which are always—to some degree—out of phase with one's current experience. Every experience has roots and bears fruits, and so points backwards and forwards in time, to old experiences and (as of yet unexperienced) new experiences.

That said, we are not always, or even perhaps all that often, updating our grounds of experience. We may have relatively unshakable memories of, or habits grounded in, the intensities of particular experiences; and it is these we “ever after” make reference to in judging the relative intensities of new experiences—it's just so bland, painful, spicy, yucky, silky (in comparison to some grounding experience). Just as there are some experiences we just cannot “shake,” there are some grounds we just cannot “sweep.”

calculate a landslide risk score to indicate the relative level of risk. The LRRS was created by reviewing published literature documenting other landslide rating systems and incorporating similar factors correlated with landslide risk. . . . These factors include slope angle, slope height, strength of slope material or material type, aperture of cracks, spatial impact, largest probable landslide volume, largest probable percentage of the living area that could be impacted from a landslide, and total person-hours a living area is occupied per day. (Faber 2016: iii)

Various dimensions (or “factors”) are being articulated in this text, and the way their relative intensity or degree is salient to the concerns at hand. To return to Aristotle, some of these dimensions seem highly relational. For example, at issue is not just what counts as a “small-scale” landslide (as opposed to one that is “large-scale”), but also what form of risk assessment counts as “too complicated” (to be undertaken by someone who resides in a landscape subject to such risks). And other dimensions seem readily quantified (aperture of cracks, angle of slopes, etc.), even if they may often have their degrees assessed in relational ways: “that’s a very steep slope” (versus “that slope is fifty degrees”).

Note how the author pauses to make explicit precisely the comparative ground he is using in regard to the first dimension: “small-scale equals the size of a house or less.” Here the comparative ground in question could not be presumed, and so had to be proposed. In contrast, the comparative ground of a degreed dimension like “too complicated” is left implicit, and so is presumed to be more or less known to, or readily imagined by, the readers of such a thesis. Note, then, how important such grounds are for teasing out key features of various comparative publics—in particular, their imaginaries of various intensities and their own and other publics’ sensitivity to them.¹¹

The study at issue is precisely designed to quantify, or at least grade in relatively precise ways (e.g., through a “landscape risk score”), two highly mediate dimensions: the probability of a landslide (or “hazard”) and the severity of a landslide (or “consequent”); and thus, ultimately, the risk of a landslide (= hazard × consequent), itself understood as the “annual probability of loss of life to an individual” (Faber 2016: 9), typically parametrized as a percentage, or as a number between 0 and 1 expressing probability.

While it might seem as if the entire effort is designed to ontologically translate a member of the Aristotelean category of “relation” into the Aristotelean category of “quantity,” it is really an attempt to generate a carefully gauged set of discrete intensities, or “severity categories.” As the author puts it, “the calculated risk scores have no absolute quantitative meaning and should only be compared to other slopes evaluated by the Final LRRS. Severity categories of Low, Medium, High, and Severe Risk have been developed to help aid in applying the scores” (ibid.: 52).

11. Most such comparative publics are simultaneously causal publics (and vice versa): groups that have shared assumptions about and sensitivities to intensities, degrees, forces, and flows in one or more domains—how the mind works, how language or the economy functions, how societies cohere (or don’t), how narratives proceed, how nature behaves, how and why God or the state acts, how infrastructure works (or breaks down), and so forth.

Such highly mediate dimensions are themselves framed as composite dimensions, consisting of an aggregated set of relatively immediate, concrete, and easy-to-quantify dimensions: not just slope height and crack aperture, but also largest probable landslide volume and total person-hours a living area is occupied per day. That is, while the most mediate dimension (risk) turns on relation, most of the immediate dimensions turn on quantity. In some sense, then, the thesis is really designed to translate an aggregate set of relatively immediate, quantitative dimensions into a single relatively mediate, relational dimension (see fig. 4).

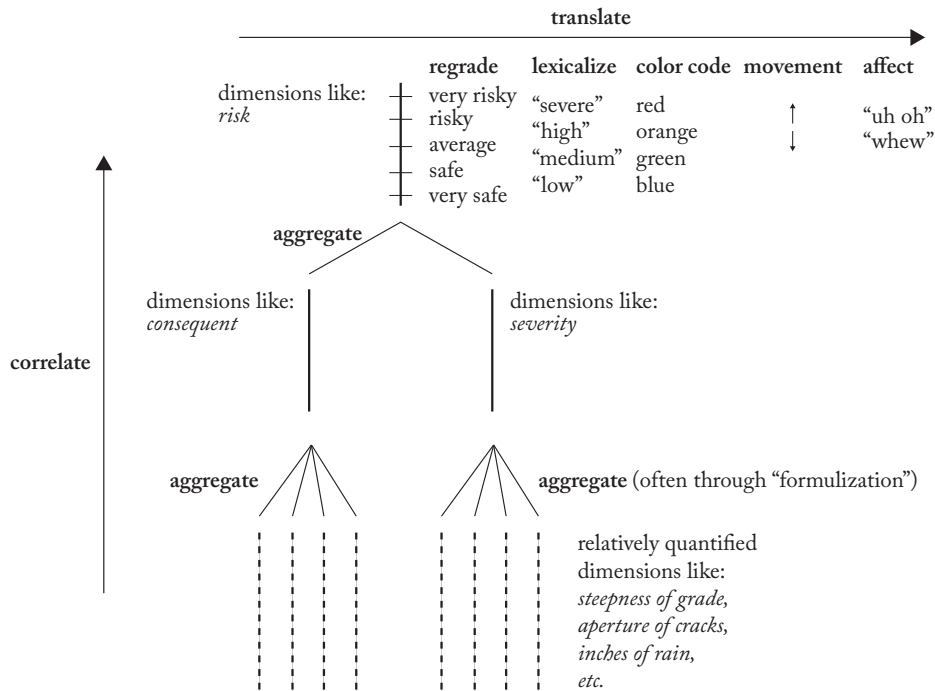


Figure 4: Aggregation, correlation, and translation of dimensions (and degrees).

Such a dimension, and its various degrees, can then be publicized as a key sign of current conditions. Indeed, they can be color coded, or iconized (e.g., red = severe, orange = moderate, etc.). Moreover, a person attentive to such signs might become desensitized to them, and only focus on their changes, or movements, with affective transformations linked to such movements: from moderate to severe (or orange to red); and hence from concerned to anxious.

Such immediate dimensions, in their various degrees, become salient precisely because they are posited to correlate with such an important effect—landslide risk, or the loss of life. That is, the comparative grounds are so important precisely because the causal grounds are so important. The author wants not only to make such immediate dimensions experientially salient, but also to make such a mediate dimension easily graded, or "rated." And the author wants to make this system known by, and user-friendly to, "non-technical experts"—in particular, the people so at risk. In all these ways, then, the author is not only making explicit, or figuring, a particular comparative ground, he is also trying to make salient a whole set of

causally interrelated dimensions, standardize their measurement, and spread this standard, for the sake of mitigating the effects of those causes.¹²

* * *

Lest the reader think that such issues are particular to expert registers, pertinent only to physical processes, or salient only when the stakes are so obviously high, we now turn to the figuring of comparative grounds in a more typical ethnographic context. The following utterances are from a speaker of Q'eqchi' (Maya) from a rural village in the cloud forests of highland Guatemala (rather than a Spanish-speaking settlement on the outskirts of its largest city), discussing the causes of shame:

(a) *qa-ye'-aq mare q'axal tiqto-k-Ø a'an naq sa' iglesya, sa' li sant-il iglesya,*
 E(1p)-say-Hor perhaps exceedingly dressed_up-Pres-A(3s) Pro(3s)
 Comp Prep church Prep Dm saint-Der church
 "let's say perhaps he is exceedingly dressed up when at church, at the holy church"

(b) *a'-ut l-aa'in tiqto-k-in,*
 Tpc-and Dm-Pro(1s) dressed_up-Pres-Abs(1s)
 "and I am dressed up"

(c) *wan-Ø-Ø in-xutaan x-b'aan li w-amig,*
 exist-Pres-A(3s) E(1s)-shame E(3s)-because Dm E(1s)-friend
 "I am ashamed because of my friend"

(d) *solo juntaq'èet-o' li qa-chihab',*
 only same-Abs(1p) Dm E(1p)-year
 "only (if) we are the same (in) our years"

(e) *moko cheq ta qa-ye'-aq,*
 Neg old Neg E(1p)-say-Hor
 "he is not old, let's say"

(f) *li aj cheq na-Ø-r-aj b'ayaq chi-w-u,*
 Dm SD old Pres-A(3s)-E(3s)-want/need a_little Prep-E(1s)-face
 "the old man requires a little bit more in comparison to me"

(g) *mare mas junxil na-Ø-bk chaq x-t'am-b'al li-x tumin,*
 perhaps very before Pres-A(3s)-begin Part E(3s)-collect-Nom Dm-E(3s)
 money
 "perhaps very long ago he began to collect (or save) his money"

(h) *moko t-Ø-ruu-q ta t-Ø-in-b'is w-ib' r-ik'in l-aa'in*
 Neg Fut-A(3s)-able-NS Neg Fut-A(3s)-E(1s)-measure E(1s)-Rflx E(3s)-
 with Dm-Pro(1s)
 "I will not be able to measure myself with (respect to) him"

This example is illustrative of many points. First, an affective state is being discussed: shame (*xutaan*), and how one's shame may be caused by the fact that another has a larger degree of something (such as fineness of dress or quantity of money), when the two actors in question (self and other) are of the same age (and

12. Such grounds, then, may be manufactured as much as mediated.

thus relatively comparable). Indeed, they are explicitly characterized as friends in line (c). That is, a *difference* in degrees along a particular dimension (well-dressedness) causes an effect (shame) only when the social actors who possess the degreed dimensions in question are (more or less) the *same* in status, or age-grade. This shows that grading is not just about a relation between two “things” (e.g., a figure and ground of comparison); it often turns on the relation between two things in relation to a relation between two “people” (e.g., speaker and addressee, or speaker and topic)—and only as such generates a force, or “affects” them (see fig. 5).

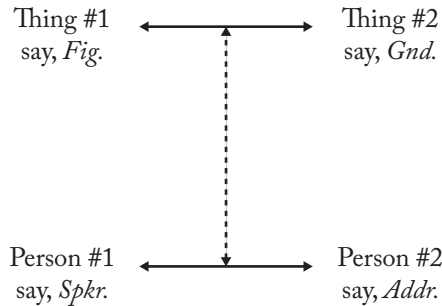


Figure 5: Relations between relations.

In this way, negative emotions, no less than landslides, may be caused by differences in quantities of qualities, or rather gradients in degrees along particular dimensions.

Second, while this example shows an explicit comparison (line f), it also shows an implicit comparison, as evinced in discourse parallelism. In lines (a) and (b), for example, we learn that while the speaker’s friend is exceedingly dressed up, the speaker is only dressed up (the implication being that the friend is much better dressed than the speaker). This was the preferred way of making comparisons among speakers in this community: two syntactically parallel constructions, each predicating the same feature of a different referent, in which one referent’s predicate is graded upwards or downwards from the other. Framed another way, rather than put two entities in explicit comparison to each other, use discourse parallelism to put them each in comparison with a third entity (often an average, normative, or typical degree of some quality), such that they are contextually put in comparison with each other (see fig. 6).

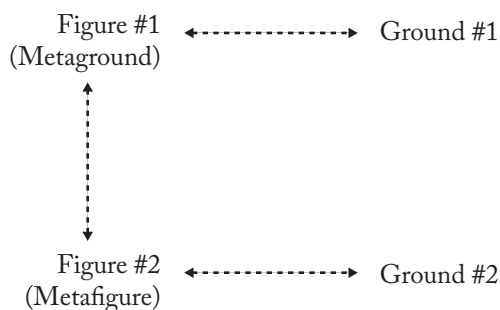


Figure 6: Figures and grounds of comparison in parallel constructions.

In this way, the comparison is discursive rather than grammatical, and turns on a relation between two relations. While this comparison involves parallel constructions by the same speaker, similar comparisons may also involve parallel constructions by different speakers: after you assess the relative degree of some dimension, I assess the relative degree of the same dimension in relation to your assessment, in relation to our social relation, and so forth.

Turning to linguistic constructions, line (a) shows the degree modifier *q'axal*. This word is related to the verb *q'axok*, which means “to pass” or “to cross,” and so the operative metaphor is arguably one of passing a certain normative or expected amount. In both glosses and usage, this often functions like a conditional superlative, akin to *-issimo* in Italian. For example, this word is often paired with the adjective *us* “good,” with the entire phrase being glossed as “excellent.” The predicate being modified (*tiqto*) usually means well-dressed or “dressed up,” as opposed to just dressed, and so, clearly, simple lexical distinctions have implications for differences in grade. Arguably, then, there is a double gradation taking place: the friend is not just dressed up (relative to other people, or relative to his normal, day-to-day dress), but with *q'axal* he is exceedingly dressed up, and thus dressed up even relative to other dressed up people (such as the speaker).

Note, by the way, that line (a) suggests that even nouns may be graded and, indeed, upgraded in a single utterance. At first a church (*iglesya*) is introduced, and then it is introduced again, but now as a (particularly) holy church (*li santil iglesya*). Indeed, also likely, the speaker is making sure to indicate that he is being sufficiently respectful of such a setting, that he is exhibiting a high-enough degree of this key dimension.

Finally, line (h), which in some sense sums up the entire exchange, shows that there are local theories of grade and measure as much as local practices of grading and measurement. Thus, while grading is a relatively ubiquitous and tacit practice, it may also be articulated and valorized as a process. Indeed, the speaker is not only sharing a comparative ground with the anthropologist, he is also sharing a causal ground: for experience is to affect as cause is to effect.

* * *

In regard to the communicative practices that turn on such grounds, a few important points should be kept in mind. As both these examples show, grounds need not stay in the background; they may also be brought to the foreground, or figured—through semiotic processes that make them relatively public, unambiguous, or explicit. Moreover, as the first example showed, such a figuring can serve to performatively constitute the ground so communicated. The thesis on landslide risk, for instance, served to establish various gradations of risk. Indeed, even utterances like “this is too steep” or “this is not safe” may serve to establish what should be considered “steep” or “safe” (as a norm, or comparative ground, for some class of entities, given some set of concerns), rather than serve to communicate that the token in question is steep or safe (given some preexisting, or mutually presumed, ground of comparison).

What is the figure of one communicative practice can go on to become the ground of a subsequent communicative practice. That is, if *this* is shameful, steep, or complicated (relative to *that*), something else can be shameful, steep, or

complicated (relative to *this*), and so on, down the line. How high an object, or event, is “upstream” in such a calibration cascade, so to speak, is a good indicator of its centrality to a collectivity, as a kind of standard, touchstone, or exemplar.¹³ If the thesis on risk assessment is successful, for example, subsequent assessments, as well as systems of assessment, will make reference to it.¹⁴

To some degree one is always implicitly grading oneself whenever one grades something else. For example, when I say that something is heavy or light I am, in part, saying that it seems heavy or light *to me*, and thus that I am relatively weak or strong, insensitive or sensitive, impressionable or indifferent. Indeed, one is just as often grading others. For example, when I say, “that is quite heavy,” I may, to some degree, be implying that you are not strong enough to lift it. To state that certain systems of risk assessment are too complicated, for example, is to invite the inference that certain people are not sophisticated enough to understand them.

A key issue is not just that certain kinds of people engage in certain kinds of grading practices, but that such practices may become indicative of their identity. In other words, in some group’s ontology (where the group in question may include the people so ontologized), such practices are indices of certain social kinds: gender, race, class, ethnicity, nationality, occupation, mood, personality, and so forth. To return to Aristotle, it is not just that we categorize people (and things) via our grading practices (e.g., that is a risky environment, or a shameful event), it is that we get categorized by people (and things) because of our grading practices (e.g., we are the kind of people who would grade that environment as risky, or I am the kind of person who would grade that interaction as shameful). And, of course, there are signs of these index–identity relations that get mediated and manufactured in well-known ways and, through their expression and circulation, thereby contribute to the perdurance and pervasiveness of such ontologies—movies, books, jokes, gossip, and advertisements, for example, that portray members of particular identities as more or less sensitive to certain intensities of certain dimensions, as well as to certain sequencings of particular events.

Indeed, we don’t just get categorized in all-or-nothing ways, but by degrees: we belong—more or less—to such a category, depending on the degree to which we evince certain salient dimensions: for example, the frequency with which we make

13. And who controls it often has a kind of unearthly power. See, for example, Kula (1986) on standards of measurement, Kripke (1980) on indexical chains, Silverstein (2004) on centers of emanation, and Kockelman and Bernstein (2012) on the portability of calibration.

14. Crucially, in regard to the quantia of many qualia, neither *symmetric* grounds nor *asymmetric* grounds are in place (for these presume we have a shared understanding of our sharedness, or lack-of-sharedness, of understanding; and hence some kind of mutually recognized metric or ground). Just as important, arguably, are *ametric* encounters: when we don’t know what we both know (or what only one of us knows, or what one of us would like to know, etc.), in regard to the degrees of particular dimensions (relevant to a particular entity or individual). Communication, and the gauging of shared assumptions, in such contexts is, in large part, prediscursive, and will be taken up in part 2. This is what one has to theorize to adequately handle that which is ametric, or “beyond measure.”



such judgments, or the degree of certainty with which we espouse such judgments. For *contra* Aristotle, “substances” (or kinds more generally) admit of degrees as much as “qualities,” even if they might only do so in relatively surreptitious, or covert, ways. We will return to this key point below.

Finally, it cannot be emphasized enough that grading does not just reflect, or represent, gradients in the world, it also transforms them. It does this, in part, by transforming the norms and values of the people who reckon them, or their beliefs, desires, social relations, and so forth (for these, too, are part of the world). And it does this, in part, by changing their assumptions about the world in ways that cause them to act differently, which brings the world more (or less) in line with such assumptions.

Grounding causality

This Mayan village has suffered many “small-scale” landslides. For example, around eleven o'clock at night, in August 2000, after six hours of constant rain, the ground beneath a corn field, or milpa (*k'al*), planted on a steep hill above a family's housing site gave way. The flowing mud, water, and rocks demolished their thatch-roofed home, strewing its pieces along the steep 100 meter stretch of hillside below. The family had a second house, a newer building with a metal roof that the river of mud missed by only a few meters, which they managed to get inside just before the other building, where they normally slept, was destroyed—along with a large supply of corn, most of their chickens, and much of their clothing.

I was staying in the mayor's house at the time, and so in a similar housing site, on the same hillside—but much closer to the valley below, and so lower in elevation, and much more gradual in slope. The mayor spent the night taking care of that family, trying to save their remaining domestic animals, and then alerting other families to keep safe while asking them to provide help. By seven o'clock the next morning, the rains had stopped and all the men in the village, and most of the women with relatively strong kinship relations to the family, had arrived at the site of the landslide. Within a day, they had salvaged as much as they could from the mud, built that family a substitute (*reeqaj*) for their old home in the valley below, and dismantled and rebuilt the remaining house right next to it.

All this occurred about two years after Hurricane Mitch, which swept through Central America in November 1998, killing almost eleven thousand people, and causing billions of dollars in damage to homes, crops, and infrastructure. The mayor himself had been trained to be a hurricane safety “promoter” by an ecologically minded NGO that had been at work in this village for almost a decade; and so he had been trained to teach other villagers how to terrace their cornfields in order to avoid such mudslides (Kockelman 2016a). Villagers were therefore well aware of the dangers and causal triggers—most obviously, heavy rains and steep slopes, but also the planting of corn where there had used to be cloud forest—and thus the effects of severe weather on exposed hillsides.

While villagers tended to focus on proximal causes in their day-to-day conversations (heavy rain, in particular), many would also describe less proximate causes: the destruction of cloud forests for corn fields, the overplanting of corn fields, and

farming at high altitudes on steep and exposed hillsides. These causes, in turn, were understood to be the effects of even more distal causes—in particular, overpopulation and land scarcity. Moreover, some villagers—especially those heavily involved with the NGO and various government agencies—would see these causes as effects of still further causes (as might many anthropologists): the unavailability of cheap contraception or health education; the occupation of huge quantities of high-yield land at lower elevations, more suitable for farming, by a small number of wealthy landowners, who focused on export crops like coffee. And, of course, these causes may themselves be seen as the effects of still further causes: the civil war, global markets, colonialism, racism, neoliberalism, poverty, a weak and corrupt state, the legacy of conquest, the nature of man, and so on. As will be seen below, what cause one posits and what effect one is attempting to explain through that cause index one's identity (values, interests, beliefs, social relations, political party, religion, etc.) as much as they refer to any real facts about history, nature, or society.

I want to highlight just one interaction that occurred in the midst of this mudslide—itsself at the opposite extreme of our last example, with its discussion of shame and sartorial status. Later in the morning after the landslide, the mayor came in to drink some coffee and rest a little before going back out. Needless to say, he looked absolutely exhausted—eyes bloodshot, hair and clothing caked with mud, his body steaming—as he sat on a stool by the hearth fire, everyone now silent around him, the men and women stopping their work and conversations to watch him. After a little bit, he lifted the lapels of his shirt over his eyes and started to cry, saying *maaka' chik lix wex*, or “he has no more pants” (equivalently: “he no longer has pants”), speaking of the man who had just lost his home. While the mayor had been a rock of resolve and action all night, and while a single item of clothing might have now seemed like the least of that family's worries, this was the only time I saw a Q'eqchi' man cry, and I couldn't help but start crying across from him. That family had lost the entirety of their possessions: home and field, crops and land, animals and clothing. And they had narrowly missed losing their lives.

I don't have the eloquence to do more for this experience than this, so I'll merely indicate the hopefully obvious ways it bears on the concerns of this article: the degradation of landscape and livelihood; the loss of one's lowest sign of status; the support of an entire village to build a new home in less than a day; the simplest sharing of sympathies, or grace; and all this in the midst of gradients and grading gone awry, and the intertwining of comparative and causal grounds.

* * *

I use the term “gradient” in two related senses. In an unmarked sense it means the way relative degrees (or quantities) of relevant dimensions (or qualities) vary over space, in time, or across individuals. Such dimensions might include income and age as much as temperature and altitude. In a marked sense it captures the technical definition employed by physicists or mathematicians: the derivative of a function in several dimensions; and hence the slope, or “grade,” of the function at every point.

This latter definition should be understandable to anyone who has ever examined a contour map: altitude is a function of position; contour lines show points of equal altitude; and gradients are vectors that lie perpendicular to contours (see fig. 7).

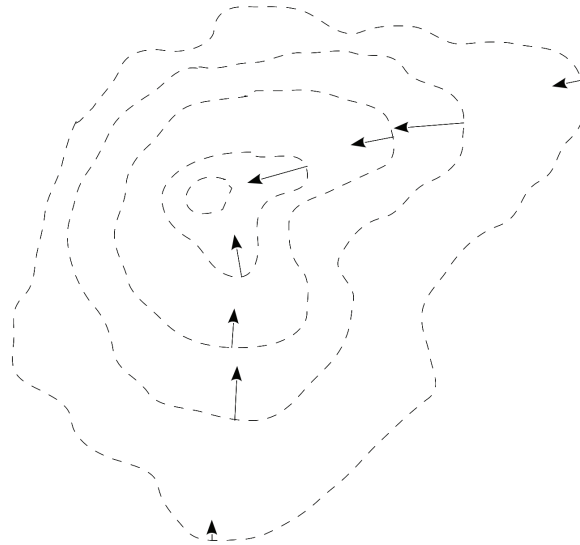


Figure 7: Gradients and contours.

Such vectors not only indicate the direction of greatest increase (or steepest grade), they also indicate the magnitude of that increase (or how steep).

Such an idea should also be intuitive to anyone who has ever experienced such a terrain. For example, if you walk along your local contour line, you do not change elevation. If you walk in the direction of your local gradient, you increase your elevation at the fastest rate (so far as it indicates the steepest path at any point). Conversely, if you move in the opposite direction, you decrease your elevation at the fastest rate. Such facts are well known—not just to mountaineers and engineers, but also to those who hike trails or carry firewood, grow crops on steep hillsides, or suffer mudslides.

For physicists, an extremely important function is the potential energy in some region. This is because the negative gradient of such a function specifies the forces acting on a body at any point in that region; and this force determines the amount of work required to move a body through a distance against that force. To continue with our example, a particularly relevant kind of potential energy arises through an entity's interaction with the earth's gravitational field in some relatively hilly terrain. For many situations, this potential energy is proportional to the entity's altitude, or height above sea level. And it is approximated by the following function: $mgh(x,y)$, or mass (m) of entity times gravitational constant (g) times height (h), itself a function of position. Any object placed in such a terrain will be acted on by a force pointing in the opposite direction of, and proportional to, the gradient of this function (in particular, a force whose x - and y -components are $-mg\partial h/\partial x$ and $-mg\partial h/\partial y$, respectively). It is, with many caveats, precisely this force that pulls water, dirt, and rocks downhill.

Such is the stuff of high school physics, not to mention the science and aesthetics of cartography, as well as everyday experience and embodied intuitions. But it is

also essential to anthropology. For to really know a terrain is, in part, to know its contours and gradients, and hence its force fields. And to know its force fields is to know the virtual trajectory of any body embedded in such a terrain: where it is likely to go (or where it has been) as a function of where it currently is.

More carefully, any such body, against the ground of such a terrain (understood in terms of its force fields, and hence its gradients), is potentially a figure to an interpreting agent (who has such embodied intuitions). A body's current configuration (say, where it is, and how fast it is moving in some direction) becomes a "sign," for that interpreter, of its subsequent (or prior) configurations. And hence both its destiny and its history, so to speak, can become "objects" (in the semiotic sense) to such an agent. That is, an agent can infer (or intuit) such configurations, and come to act on such inferences, if only by stepping out of the way of sliding rocks, or planting one's *milpa* in a more suitable place; or simply by being aware, if not wary, of such possibilities in the first place (see fig. 8).

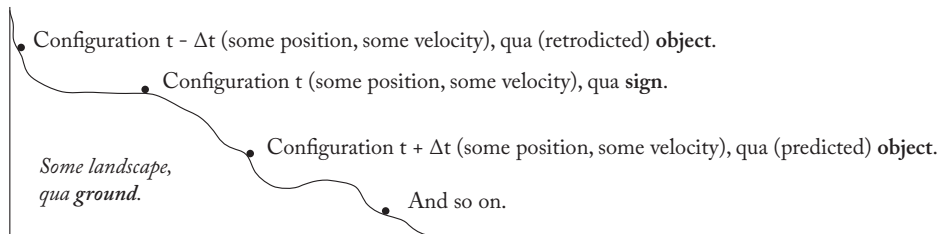


Figure 8: Gradients and semiotic grounds.

Note, then, that there are very good reasons to be attentive to gradients. They are important not just because they play a role in determining whether we will do more or less work, expend more or less energy, require more or less effort; but also because they play a role in determining whether a landslide will occur sooner or later, move faster or slower, impact harder or softer, cause a lot or a little destruction, and thus, ultimately, be "smaller" or "larger" in intensity, degree, or scale. It is for these reasons that so many decisions are based on them: not just where to build a home or whether to terrace a hill, but also what should be feared and what might be hoped.¹⁵

* * *

Such facts are not just true of terrains in the stereotypic sense (i.e., landscapes subject to gravitational fields). They are also true for all force fields in the physical sense, and, as we will now see, all flows that are enabled and constrained by such forces. In particular, for a certain kind of force, there is a "flow"—a movement of not just one entity, but a collection of entities. And this flow not only moves because of the gradient, it usually removes the gradient through its movements.¹⁶

15. To be sure, they are just one key dimension, or "factor," contributing to landslide risk; but, as we will see below, very similar considerations hold for the other dimensions as well.

16. See Kondepudi and Prigogine (1998, cha. 15); and see Kleidon (2010). That said, it should be emphasized that other kinds of systems have other kinds of dynamics, many



For example, just as an altitude gradient specifies a force field which may channel the flow of rocks, dirt, and debris along certain paths, a temperature gradient specifies a force field which may channel the flow of heat along certain paths, and a concentration gradient specifies a force field which may channel the flow of air (and other gases) along certain paths.¹⁷ Each such gradient establishes a force field which causes a flow (e.g., heat-transfer, landslide, wind); and, reciprocally, such flows lead to the degradation of the gradient, and hence to the loss of the force field, and ultimately to the cessation of flow (see fig. 9).

Just as agents can make inferences about earlier and later configurations of individual particles, they can also make inferences about directions and intensities of flow, and come to act on such inferences. Indeed, just as we can, to some extent, *escape* such flows, we can, to some extent, *scrape* such flows (Langdon 2007a, 2007b). For example, we can, to a certain degree, channel such flows—directing them or deflecting them, tapping them or capping them. Indeed, no small part of infrastructure is designed with precisely such functions in mind: not just the terracing of cornfields, but also dams, drains, pipes, wires, capacitors, insulators, windbreaks, levees, thermoses, chicken coops, weirs, water meters, communication resources, payment infrastructure, and the like (Elyachar 2010; Kockelman 2010a, 2016a; Maurer, Nelms, and Rea 2013).

of which seem to counteract degradation (at least locally), while simultaneously acting as conditions of possibility for grace (at least over the very *longue durée*). For example, we can always use the energy released by depleting one gradient as a means to create another gradient as an end. So long as a system is relatively open, such that it can exchange fluxes of heat or matter with its surrounding context, then it can maintain its gradients, or even increase them, if it can capture the flux.

Similar processes are fundamental to living systems. Indeed, it seems that some agents are incredible good—or at least better than their competitors—at capturing fluxes (or dissipating external gradients), and thereby increasing their own order at the expense of the order around them. Some have even suggested that there is a fourth law of thermodynamics. Loosely speaking, systems don't just maximize entropy (or dissipate free energy), they do so in the fastest possible manner given the available constraints (Swenson 1997; Martyushev and Seleznev 2006; Kleidon 2010, 2012; inter alia).

Swenson (1997) also made the provocative claim that the evolutionary move toward complexity (and, hence, against entropy) makes sense—and, indeed, might even be expected—once we realize that what highly complex systems (in particular, living organisms) are really good at is detecting and tapping gradients, and hence dissipating free energy as fast as possible. Finally, it should be emphasized that organisms do not just *grade* their environments, they are also *graded by* them. At the heart of evolution are sieving processes that turn on gradients: organisms, to some degree, are graded better or worse, more fit or less fit, as a function of how good they are at sussing out, forging up, communicating about, and tapping out, gradients. Kockelman (2011) treats such processes of “upgrading,” “aggrading,” and the like.

17. Kockelman (2009) discusses the “constraints” that underlie such channels, and that contribute to “the meaningful organization of complexity” more generally.

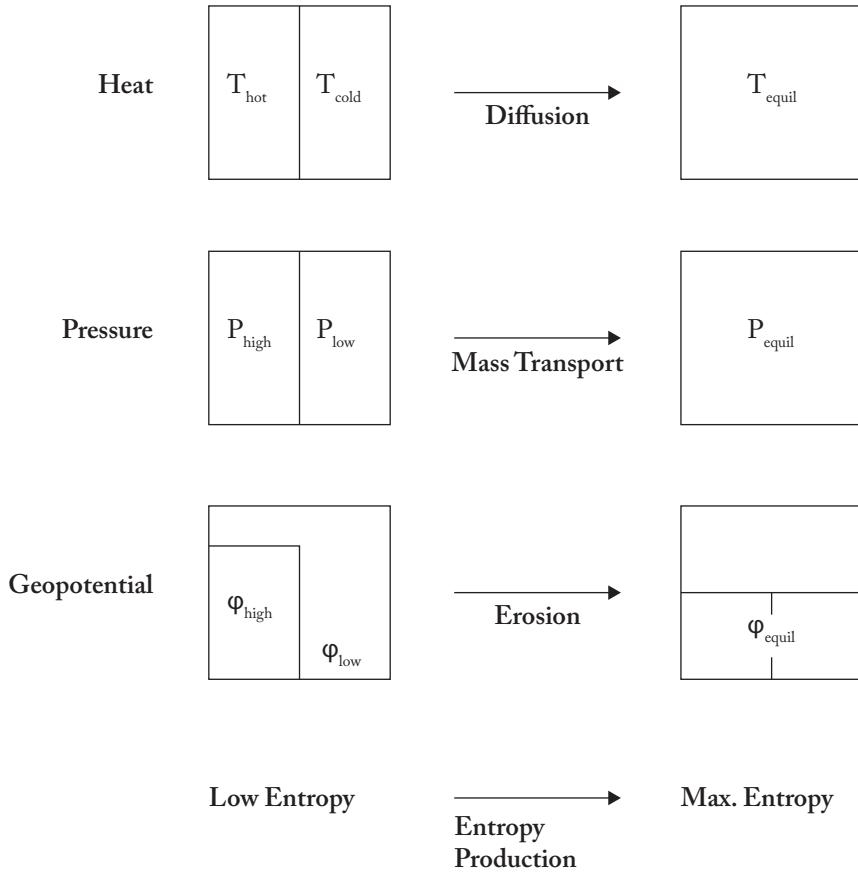


Figure 9: Gradient, flow, degradation (adopted from Kleidon [2010: 434]).

Agents often understand, to a certain degree, not just the causes of the flows, but also their consequences. They are also attentive to degradation, and hence to the self-canceling aspects of many channels. Just as many agents know that sliding rocks can come to a stop (assuming the ground levels out and there is enough friction), they also know that, if enough rocks have slid, such that there has been significant degradation, and such that the grade is no longer very steep, no more rocks will slide. (Consequently, they can walk the grounds again, if only for a little while.)

* * *

Crucially, one can have a better or worse sense of a terrain, and so a better or worse sense of how events will unfold, or in which direction flows will go, or what forms of degradation will arise and why. Indeed, perhaps more often than not, our inferential thinking and instrumental acting are out of touch with a terrain. When forces, and hence flows, are predictable, a simple metaphor is often in order: in the context of a force field as a kind of “path,” certain events, as “origins,” lead to other events, as “destinations.” But when parasites abound, every point along a path between an origin and a destination can itself be an origin to other destinations, or a destination from other origins (Peirce 1955; Serres [1980] 2007; Kockelman

2010a). The most important forces are arguably parasitic forces—those which upset the unfolding of events, or redirect the movement of flows, in unpredictable ways; so that our inferences are incorrect and our actions go awry (see fig. 10).

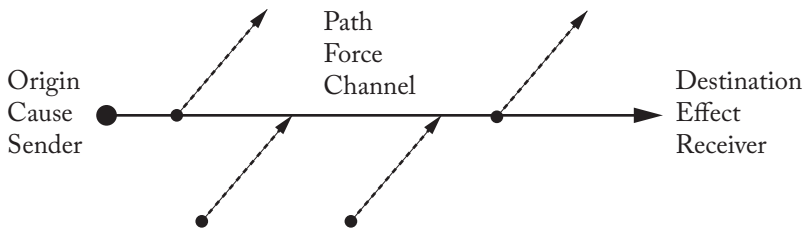


Figure 10: Force as path or channel (plus parasites, qua subsidiary paths, shown as dotted lines).

Indeed, a key function of infrastructure (and, arguably, institutions and imaginaries) is not just to distribute intended force fields, such that causal processes become reliable and predictable; it is also to keep out or contain as much as possible all the unintended or unexpected forces, all the parasitic processes. Simondon ([1958] 2016), for example, seems to have equated this containment with “objectivity”; and, at the very least, it is an important aspect of “enclosure” (Kockelman 2007a), broadly speaking.

Needless to say, many kinds of infrastructure, while keeping out parasitic processes as just defined, are themselves instances of parasites in more conventional terms: that which takes without giving; that which lives on by living off; that which *upgrades* itself by *downgrading* others. And these latter kinds of parasites, so far as they lead to irreversibility, bear a family resemblance to enemies, parasites, and noise, as that which increases entropy, as that which underlies degradation and dissipation (Serres [1980] 2007; Kockelman 2010a; da Col 2012; inter alia). The trick, as always, is to be agentive enough to discover and direct flows, to scape and escape them, as opposed to suffering their consequences or being oblivious to their conditions. (To be sure, such a trick has yet to be achieved.)

* * *

We have so far been focused on a relatively narrow range of causal processes, those well known to students of classical dynamics and linear nonequilibrium thermodynamics. And we have so far been focused on two interrelated themes: firstly, the ways that gradients lead to flows; and, secondly, the way that agents, who are attentive to such gradients, can make inferences about such flows, and act on such inferences. In some sense, we have been tacking between the physics and the phenomenology of forces. Before continuing, it is worth radically widening the range of causal processes we are interested in.

Speakers of Q̣eqchi’ often make causal grounds explicit using two conditionally conjoined clauses. There is an antecedent clause, headed by the particle *wi* “if,” which describes a condition or cause; and there is consequent clause which describes the effect such a condition will bring about if met. Here are three examples from my fieldwork in that village:

- (i) *wi wan-Ø-Ø naab'al in-kok'-al, mas neb'a'-q-o*
if exist-Pres-A(3s) many E(1s)-many_small-child very
poor-Fut-A(1p)
“if I have many babies, we will be very poor”
- (ii) *wi ka'ajwi' li winq t-Ø-kanjelaq, li tumin moko na-Ø-tz'aqlok ta cho'q r-e li jun kab'al*
if only Dm man Fut-A(3s)-work Dm money Neg Pres-A(3s)-be_
enough Neg for E(3s)-RN Dm one house- Abs
“if only the man works, the money is not enough for one household”
- (iii) *wi t-Ø-in-ket li arroz, ti-Ø-x-ket ajwi' l-in k'al li li motzo'*
'if Fut-A(3s)-E(1s)-eat Dm rice Fut-A(3s)-E(3s) also Dm-E(1s)
milpa Dm Dm worms
“if I eat rice, the worms will also eat my cornfields”

The first two statements were uttered by young women, each with several children. Both describe causal relations of a relatively mundane, but starkly important variety: the domestic economy, and its conditions of production and reproduction. Note how the first example switches from first-person singular, when describing the condition, to first-person plural, when describing the consequent: the woman is being positioned as having control over the condition (having babies); while the husband and wife, or entire family, are positioned as suffering the consequent (being poor). As may also be seen, both the antecedent and the consequent turn on comparative grounds: what counts as “many” (*naab'al*) babies; what counts as “very poor” (*mas neb'a'*). These were two kinds of comparative grounds that were in transition during my fieldwork, and highly contentious.

This entwining of comparative and causal grounds is very frequent—recall, for example, our discussion of shame. It is also evinced in example (ii), which involves a particularly important comparative ground: what counts as “enough” (or not enough), in regard to some resource for the sake of some end. Here the resource in question was money, and the end was provisioning a household. But sufficiency of degree, or “enoughness,” was at issue in this village across a wide range of dimensions: strength, know-how, age, wage, and so forth (see Kockelman 2016a). In this utterance, the antecedent clause involves an existential quantifier *ka'ajwi'* “only.” Context-specificity is at work similar to what we saw in our discussion of Aristotle: to say only *X* did something is not just to propose that *X* did something, it is also to presuppose that there is no other *Y* (within some context-specific domain) that also did that something. In this case, the presupposed domain is the family, and so the presupposition is something like, “and not the woman.” Note, then, that in both these examples there is a tension between the actions of one member of a married couple and the economic repercussions of those actions for the entire family. And much of the gendered tension is revealed in the presupposition.

The third example comes from an ethnographic interview in which a man was discussing *awas*, which are the local equivalent of taboos. Here the man is asserting that if one eats noodles, a decidedly non-Mayan food, while engaged in the distinctly Mayan practice of planting corn, then one's corn, when it comes up, will also be maggoty (i.e., noodle-like), and thus impossible to eat. These kind of causal linkages run throughout Mayan thought, and are also highly gendered (and specied).

In particular, what the man does while planting has effects on the corn so planted; what the woman does while pregnant (or while her hen is brooding) will have effects on her children (or on her chicken's chicks). Moreover, it is usually an iconic resemblance between two events that leads to the indexical connection between those events (a connection and resemblance that is itself conventionally established and symbolized). I take up these taboos at length elsewhere (Kockelman 2010b), and I also show (Kockelman 2016a) how they relate to comparative grounds and poultry husbandry. For example, drinking coffee while planting corn causes the ears of corn to be black like coffee (and so inedible) because “coffee is much blacker than corncocks” (*q'eq-q'eq li kape' chi-r-u li hal*). Recall our discussion of the relative sharpness of machetes—a similar construction is being used here. Like our example of shame, a substantial difference in degrees along a salient dimension licenses a causal connection.

Let me offer one last example of a causal construction turning on a comparative ground:

- (iv) *mas sa x-o-wark x-b'aan naq maak'a' chik li hab'*
 very good Perf-A(1p)-sleep E(3s)-because Comp not_exist more
 Dm rain
 “we slept very well because there was no more rain” [equivalently
 “there was no longer any rain”]

This was said by the man who owned the house that was destroyed by the mudslide. Two nights later, he hadn't yet moved into his newly built house, but was still staying in the mayor's house. Again we have the intensity of one event (quality of sleep) causally tied to the intensity of another event and, in particular, to the transformation, or diminishing movement, of that other event. (And, of course, the man is speaking for his whole family—reporting the quality of all of their sleep, and its cause.) Here the man makes explicit, or states, a causal connection between rain, that most proximal and “grabby” of causes, and sleep. Simultaneously, he makes implicit, or shows, a causal connection between rain and landslides. That is, the man's sleep was troubled not by rain per se, but by the effect of rain in a given terrain; and it was this effect that would have troubled his sleep. Finally, note the relation between this construction “no more rain,” and the construction treated above, “no more pants.” In both cases, change in intensity, or movement in degree, is key.¹⁸

In this construction the causal relation is made explicit via the relational noun *-b'aan*, which means “because of.” Such a construction could be loosely paraphrased in terms of the if-then construction just exemplified: if there is no more rain, then we will sleep well. When not used as a relational noun, the same noun (*b'aan*) means “medicine.” The relational noun *-maak* is also used to mark causal relations, and so is usually best translated as “because of.” Additionally, it often highlights the moral culpability of the causal agent in question. When not used as a relational noun, the same noun (*maak*) means “sin.” Note, then, the lexical relations causality has to notions like moral culpability and illness remedy—and, of course, agency. Both relational nouns can be used, for example, to mark demoted agents in

18. As detailed in Kockelman (2010b, 2016), aspect and grade, or temporality and intensity, are closely related categories (as are affect and causality).

passive constructions: “I drank the water” → “the water was drunk *by* me.” As will be discussed in part 2, when we take up grace, to express thanks in Q’eqchi’, one says *b’aantyoq*, or “because of God” (*tyox* < Spanish *dios*).

The notion of *awas*, discussed above, is closely tied to both issues: just as a moral failing can generate the effect, proper medicine, or ritual remedying, can mitigate the effect. As we will see in part 2, the key agent underlying many such causal processes was the local “earth god,” or *Tzuultaq’a*. As an early anthropologist put it: this agent is “the prime source of all mysterious powers” (Burkitt 1902: 450). In a somewhat hermeneutically overdetermined fashion, this word is a compound construction (or *difrasismo*), consisting of the words *tzuul* “hill” and *taq’a* “valley”—whose referents are the highest and lowest graded points in a terrain. As should be clear (recall fig. 9), to the physically minded, such attributions of agency are not at all misplaced, or fetish-like: gradients are indeed the ultimate source of power (and degradation).

* * *

One could go into the ethnography of causal grounds, and into the linguistics of causal constructions, in much greater detail.¹⁹ For the moment, it is instructive to abstract from such details, in order to highlight a few overarching principles. As seen from the foregoing examples, a relatively stereotypical causal process goes like this: one event (E_1) leads to another event (E_2) in the context of a field of forces. For example, not only do heavy rains cause poor sleep and not only does eating rice lead to wormy corn, but flicking a switch causes a light to turn on, a thrown rock causes a broken window, and rising temperatures cause icebergs to melt. To return to our path metaphor, if you start off from a given origin (E_1) in the context of a certain path (the force field), you will end up at a given destination (E_2).

To be sure, such causes have radically different natures and cultures. For example, certain force fields only hold among members of the collectivity who recognize such a convention; others only hold in environments that incorporate a certain infrastructure. Some may be relatively widespread and timeless; others relatively singular and idiosyncratic. While some seem to be based in Peircean “Secondness” (fire causes smoke) and others in Peircean “Thirdness” (people stop at stop signs because of an interpretable indexical rule), which could be characterized as “nature” versus “convention,” most don’t fall neatly into one category or the other.

19. Indeed, from the standpoint of language, not only can “events” be easily reframed as “entities” (and vice versa), but one and the same “happening” can be framed as a single event, or as two (or more) events, one related to the other as cause to effect. (Indeed, not only different constructions, but also different predicates, can project different degrees of causality onto one and the same event.) In our focus on conditional constructions, for example, we examined linguistic constructions that relate two clauses: one representing an antecedent event, and the other representing a consequent event. Such constructions are at the “top end” of the interclausal relations hierarchy, a cross-linguistic form-functional domain whereby the “closer” two events are construed semantically (either causally or logically), the “tighter” two verbs are bound grammatically (Silverstein 1993; Van Valin and LaPolla 1997; Kockelman 2010b: ch. 3). Note the diagrammatic iconicity of all this.

Some are relatively efficient, others are relative “telic” (and, as will be taken up below, “teleonomic”). Some are relatively direct, others are relatively indirect, or “systemic” (Lakoff 2012). Almost all depend on vast ensembles of backgrounded causal processes, which surreptitiously structure the terrain in which the focal causal process proceeds. A collectivity’s assumptions about such forms are usually hidebound with interest and ideology, conflict and contention, and so forth.

My focus here is not on the diverse causes per se, for there is no end to the ways that one event’s happening may be channeled into another event’s happening, and hence no end to the kinds of knowledge needed to understand such channels. I am, rather, interested in the ways such force fields are caught up in instrumental and inferential practices, and hence semiotic processes.

Suppose, for example, that an agent is more or less aware of the causal relation between two such events; and suppose that an agent is more or less able to sense and/or instigate such events. Such an agent might instigate E_1 as a means to bring about E_2 as an end, or staunch E_1 in order to forestall E_2 . And such an agent might predict E_2 (having sensed E_1), or retrodict E_1 (having sensed E_2). In other words, to such an agent, E_1 and E_2 relate not just as cause and effect, but also, at least potentially, as means to ends, sign of object, and object of sign (see fig. 11).

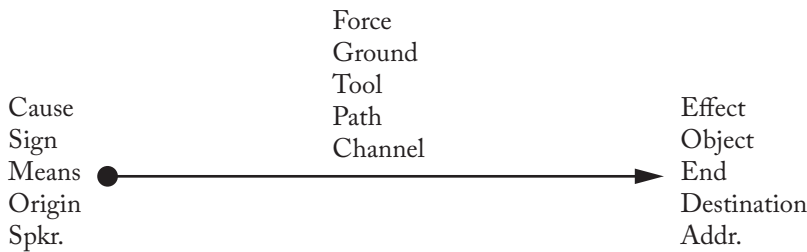


Figure 11: Cause–effect, sign–object, means–end, origin–destination, speaker–addressee.

Acting and inferring require causal understandings of the world, understandings which may be more or less truthful (or at least useful), more or less widespread, more or less stable, more or less typical or singular, and, as we saw above, more or less prone to parasites. Whenever we act or infer we evince our causal understandings of the world (as well as our causal *mis*understandings of the world), and hence our sense of the various channels along which event sequencings flow (whether or not they actually do). And, insofar as such causal grounds are caught up in inferential and instrumental processes, they are caught up in “agency,” that is, in our ability to flexibly channel causality and in our accountability for such an ability.²⁰

Phrased another way, in each example of causality offered above there is a relation between two events (entities, experiences, etc.) that is the result of a particular “causal ground” (terrain, gradient, force field, convention, channel, etc.). So long as one is aware of the ground, and of the kinds of correlations it enables and constrains, so long as parasites are held in check, and so long as one has certain

20. In other work (Kockelman 2007b), I argue not only that agency is a radically distributed phenomenon, but also that it is a multidimensional and graduated—or “by degrees”—phenomenon.

capacities of sensation and instigation, one can perceive one event and predict the other event, or even instigate one event in order to bring about the other event. Insofar as we understand such grounds, we can predict and partake of flows, inferring when and where they will happen, or instigating their happening. Such grounds license inferential thinking as much as instrumental action, enabling the discovery of new causes as much as the directing of old ones.²¹

* * *

It should be stressed that for most situations and to many agents any particular event is caught up in a myriad of force fields and so is (partially) *causal* of many other events, and (partially) *caused by* many other events. Moreover, any causal process may be reframed, by a particular agent, as one link in a longer causal process; or as a longer causal process which is made up of many links, each of which is a smaller causal process (see fig. 12).

Which specific events, force fields, and scales an agent attends to are, in part, a function of what events that agent can sense and instigate, what force fields that agent is aware of (that might link such events), and what fields are pertinent in a given environment, or relevant to a given collectivity of agents. And they are, in part, a function of what the agent is currently engaged in—either instrumentally or inferentially. That is to say, what particular forces we perceive, act on, or infer with are frame-dependent, and hence context-specific as much as collectivity-specific, environment-specific as much as organism-specific, matter-specific as much as mood-specific, scale-specific as much as media-specific, gnomic (mysterious and unfathomable) as much as nomic (timeless and general).

So one important question is how we come to an understanding of such grounds, such input–output relations, such event sequencings. In certain cases, we already know the ground, and so can make such connections. In other cases, we see such a connection, and thereby come to know the ground. In other cases, we can readily perceive the ground through the ruts, or effects, of past relations. In still other cases, there are particular kinds of signs indicating the presence of such a ground: “slippery when wet”; “light switch” (or simply “on” and “off”), “if I have many babies, we will be very poor,” and the like (see fig. 13).

Indeed, in many cases—like the kinds illustrated through the extended example of landslides—there are entire institutions designed to understand, intervene in, and educate others about them.

Consider Parmentier’s (1994) example of a golfer using thrown grass to make visible the wind. This is equivalent to shaking iron filings around a magnet: the pattern diagrams (however fleetingly) a vector field (to a semiotic agent attendant to a particular ground, or aware—however partially—of the effects of a particular force field). And once the causal ground has been “imaged” in this way, such an agent can—to some degree—predict and manipulate the trajectories of golf balls, grass blades, and whatever else “inherits” the wind. Or, radically repurposing Whitehead (1920), the patterning of tossed grass blades is one way the wind “ingresses” into our experience.

21. Elsewhere (Kockelman 2016b), I illustrate such semiotic processes at length, not just among the Maya, but among scientists and psychoanalysts as well. I also discuss (Kockelman 2015) the relation of such processes to semiotic grounds of the more Peircean sort.

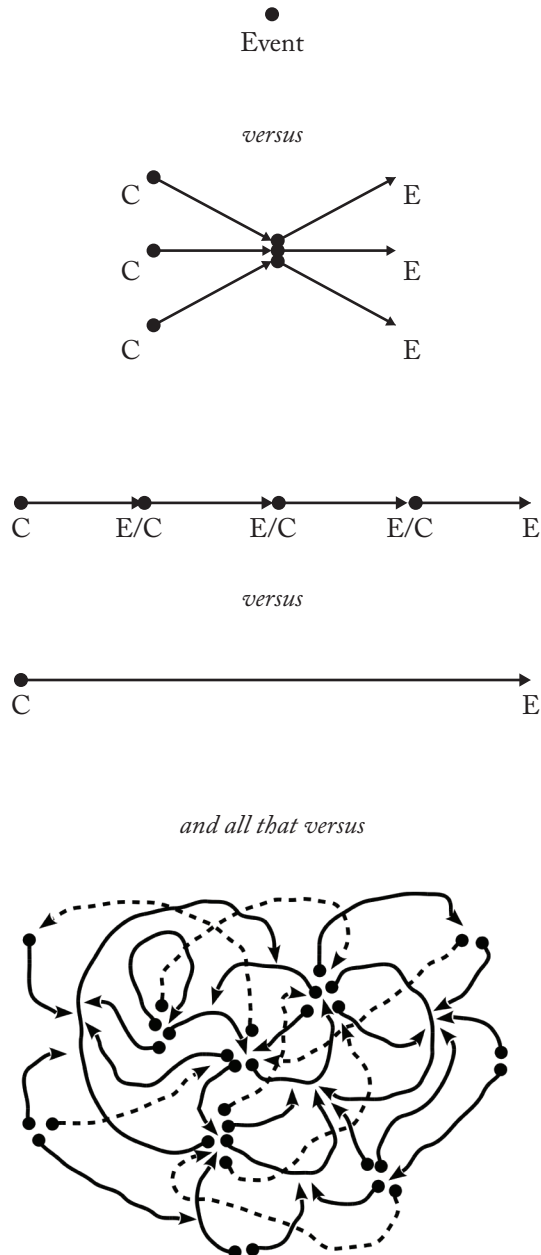


Figure 12: Reframing of causal processes.

As I discuss at length elsewhere (Kockelman 2016a: ch. 6), a particularly important kind of effect (E_2) is the setting up, removing, or rechanneling of a force field that links two other events (E_3 and E_4). In particular, an agent who instigates E_1 in order to cause E_2 , which is itself a relation between E_3 and E_4 , may thereby ultimately govern the instrumental and inferential processes of other agents, who are caught up in, or attentive to, the relation between E_3 and E_4 (see fig. 14).

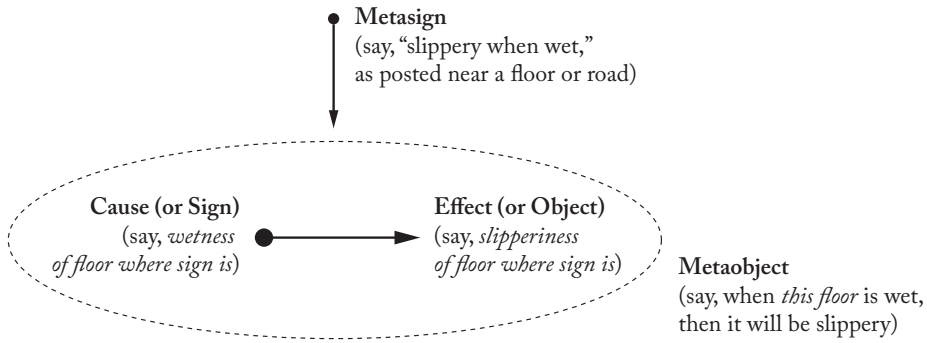


Figure 13: Metasigns of cause-effect (sign-object, means-end) relations.

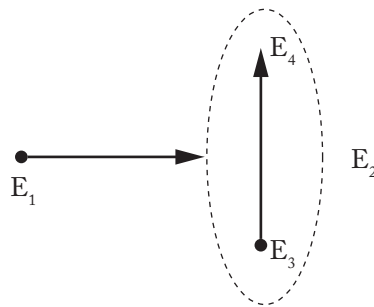


Figure 14: Causing causality.

Indeed, an even more important (and insidious) process is one that has, as its effect, the transformation of a ground per se. In particular, an agent either transforms a world of forces that agents can attend to (whether or not agents are actually attending to them), or transforms a world of agents who are attentive to particular forces (whether or not such forces actually exist). Causing causality is closely linked to conducting conduct, in the tradition of Weber and Foucault, and hence a key mode of power or governance. It is also closely linked to channeling channels (Kockelman 2010a), a key feature of communicative practice, itself also a key technique in the art of governance.²²

It cannot be emphasized enough that only a small subset of these caused flows and causal force fields are of the stereotypically physical variety discussed above. A vast number of salient causal flows and forces in a given agent-inhabited terrain are communicative and cultural in origin (Kockelman 2015): for example, objects giving rise to signs and signs giving rise to interpretants (insofar as the agents who sense such signs, and instigate such interpretants, are beholden to particular grounds). Indeed, one way to understand an ethnographic “field-site” is that it is

22. Even our decrees embody our sensibilities regarding comparative and causal grounds. What counts as a harsh punishment or a light sentence, a just decision or a timely intervention, turns on if-then and more-less relations. And so protocols, codes and laws, in addition to weights and measures per se, express our understanding and evaluation of dimensions and degrees, forces and flows.



some swatch of space-time (however distributed, multiplex, virtual, relativistic, etc.), whose inhabitants' meaningful and material processes, or semiotic and social practices, are organized by various fields. To do "field-work," as it were, is to undertake the labor necessary to come to some understanding of such an organization. It is to try to understand the assumptions and sensibilities, or causal and comparative grounds, that underlie people's understandings of a world (especially as they give rise to such a world); and it is to try to understand the worlds lived in (especially as they give rise to such understandings).

In short, causal and comparative grounds constitute a relatively precise methodological tool for understanding not only collectivities but also subjectivities; and for not only understanding differences across groups and individuals, but also tracking changes within them. Such comparative and causal grounds constitute a large part of the shared understandings necessary for the sharing of understandings, and hence a large part of what we call "culture."²³

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23. Needless to say, anthropologists must have their own comparative and causal grounds to even begin to make sense of the grounds of others.

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Graduer, gradation, dégradation, grâce: Première partie : intensité et causalité

Résumé : Cet article a deux thèmes principaux entrelacés. Le premier est la médiation sociale et sémiotique des “champs de comparaison” - en particulier, la manière dont les gens comprennent et modifient les intensités relatives d'événements comparés, ainsi que les forces que ceux-ci mobilisent. En prenant pour objet les processus multiples en jeu dans les interprétations populaires des effondrements de terrain dans un village Maya des plateaux guatémaltèques, l'article montre comment les champs de comparaisons sont associés à des forces physiques et à une expérience phénoménologique, ainsi qu'à des pratiques de communication et des conventions. Plus généralement, bien que moins explicitement, cet article aborde quatre sujets qui soutiennent l'Anthropocène: les “gradations” (comment des qualités varient en intensité dans l'espace et dans le temps, et comment ces variations se rapportent à des processus causaux), “graduer” (la manière dont les agents estiment et altèrent ces intensités, vivent et interviennent au sein du processus causal), “dégradation” (comment certaines variations très significatives en termes d'intensités sont amoindries ou perdues), et la “grâce” (la manière dont les agents maintiennent certaines gradations, se soucient de ceux dont la vie a été dégradée, et accordent de la valeur aux agents qui travaillent et se soucient des autres de cette manière).



Paul KOCKELMAN teaches in the Department of Anthropology at Yale University. His forthcoming book is entitled *The art of interpretation in the age of computation* (Oxford University Press).

*Paul Kockelman
Department of Anthropology
10 Sachem Street
New Haven, CT 06511-3707
USA
paul.kockelman@yale.edu*