

- Fintel, Kai von, and Irene Heim. in preparation. *Intensional Semantics*. Ms., available online at: <http://mit.edu/fintel/fintel-heim-intensional.pdf>; consulted on November 11, 2011.
- Hackl, Martin, Jorie Koster-Moeller, and Jason Varvoutis. 2007. Processing Evidence for Quantifier Raising: The Case of Antecedent Contained Ellipsis. Poster presented at the 20th Annual CUNY Conference on Human Sentence Processing, City University of New York, March 2007.
- Hankamer, Jorge. 1973. Why there are two *than*'s in English. In *Proceedings of the 9th Annual Meeting of CLS*, ed. C. Corum, T.C. Smith-Stark, and A. Weiser, 179-191. Chicago Linguistics Society, University of Chicago, Chicago.
- Heim, Irene. 2001. Degree Operators and Scope. In *Audiatur Vox Sapientiae. A Festschrift for Arnim von Stechow*, ed. C. Féry, and W. Sternefeld, 214-239. Berlin: Akademie-Verlag.
- Hoeksema, Jack. 1983. Negative Polarity and the Comparative. *Natural Language & Linguistic Theory* 1:403-434.
- Hofstetter, Stefan. 2009. Comparison in Turkish: A Rediscovery of the Phrasal Comparative. In *Proceedings of Sinn und Bedeutung 13*, ed. A. Riester, and T. Solstad, 191-205. University of Stuttgart, Stuttgart.
- Kennedy, Chris. 1997. Projecting the Adjective: the Syntax and Semantics of Gradability and Comparison. Doctoral dissertation, University of California, Santa Cruz.
- Kennedy, Chris. 2007. Modes of Comparison. In *Proceedings of the 43rd Annual Meeting of CLS*, ed. M. Elliott, J. Kirby, O. Sawada, E. Staraki, and S. Yoon, 141-165. Chicago Linguistics Society, University of Chicago, Chicago.
- Kornfilt, Jaklin. 2005. Free Relatives as Light-headed Relatives in Turkish. In *Organizing Grammar. Studies in Honor of Henk van Riemsdijk*, ed. H. Broekhuis, N. Corver, R. Huybregts, U. Kleinhenz, and J. Koster, 340-349. Berlin/New York: Mouton de Gruyter.
- Lechner, Winfried. 2004. *Ellipsis in Comparatives*. Berlin/New York: Mouton de Gruyter.
- Napoli, Donna Jo. 1983. Comparative Ellipsis: A Phrase Structure Analysis. *Linguistic Inquiry* 14(4):675-694.
- Riemsdijk, Henk van. 2000. SynCom Case 44: Free Relatives. Ms., University of Tilburg, Tilburg.
- Seuren, Pieter. 1973. The Comparative. In *Generative Grammar in Europe*, ed. F. Kiefer, and N. Ruwet, 528-564. Dordrecht: D. Reidel.
- Stechow, Arnim von. 1984. Comparing Semantic Theories of Comparison. *Journal of Semantics* 3:1-77.
- Winter, Yoand. 2000. Distributivity and Dependency. *Natural Language Semantics* 8:27-69.

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Directed Motion as Comparison: Evidence from Samoan*

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1. Introduction

This paper investigates the common core of directed motion verbs and comparatives in Samoan, a Polynesian language with around 200,000 speakers on the Pacific islands of Independent and American Samoa, and with approximately 370,000 speakers worldwide.¹

In the terminology of Stassen (1985), Samoan employs a "separative comparative" with the directional particle *atu* ("forth, away"). A first example is provided in (1).

- (1) E umi **atu** Malia ia Ioane.
TAP tall **away** Mary PREP. John
'Mary is taller than John.'

Comparative constructions employing directional particles or source prepositions are cross-linguistically very common: More than a third of the 110 languages in the sample of the typological study reported in Stassen (1985, 40) use a separative comparative, among them several languages of the Americas as well. Consider the data in (2) from Quechua, a language spoken in the Andes region, and the example in (3) from Navaho, an Athapaskan language, for instance.

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¹ Standard reference works include Milner (1966), Marsack (1975), and Mosel and Hovdhaugen (1992). Unless indicated otherwise, the data presented come from my own fieldwork. In working with consultants, I used the elicitation techniques presented in Matthewson (2004, 2011). I only make use of diacritics (i.e. the macron to indicate vowel length and the inverted comma to indicate the glottal stop) if required for disambiguation. Abbreviations used in glosses include INDEF.DET. = indefinite determiner, obj. = object, PART. = undefined particle, PERF. = perfective, pl. = plural, POSS. = possessive pronoun, PREP. = preposition, sg. = singular, subj. = subject, and TAP = tense-aspect particle.

- (2) Kam noka-manta sintsin.
PRN.2sg. PRN.1sg.-from strong
'You are stronger than me.'
(Stassen 1985, p. 120, no. (11))
- (3) Shí shínaaí bi-lááh 'áníshdífl.
PRN.1sg. 1sg.-older.brother 3sg.obj.-beyond 'á-ní²-1sg.subj.-big
'I'm larger than my older brother.'
(Bogal-Allbritten 2008, p. 19, no. (15a))

We can indeed conclude that "... the relation between spatial expressions and comparatives is most conspicuous." (Stassen 1985, 56) It is particularly conspicuous in the light of the Samoan data in (4) and (5).

- (4) Sa savali atu Malia i le lua kilomita.
TAP walk away Mary PREP. the two kilometer
'Mary walked two kilometers away.'
- (5) E umi atu Malia i le lua inisi i lo lona uso.
TAP long away Mary PREP. the two inch PREP. PART. POSS.3sg. sister
'Mary is two inches taller than her sister.'

Why is it that we can use *atu* with motion as well as with degree predicates? I will argue that this is so because both involve comparison, of locations along a path in the first case and of degrees on other scales in the second.

The structure of the paper is as follows: The next section establishes the empirical basis upon which the analysis is subsequently built. The first building block is an analysis of the Samoan comparative based on the notion of degree (Sect. 3.1). We are then in a position to add the second building block, and consider the conditions under which locations can play the role of degrees as well as the analysis of directed motion verbs (Sect. 3.2). I conclude with a discussion of language change in Samoan and of the crosslinguistic relevance of the proposal.

2. The Data

2.1 Directed Motion Predicates

The directional particle *atu* ('forth, away') forms a pair with the particle *mai* ('thither, hereto'); cf. also Mosel and Hovdhaugen (1992, 376-378). Consider (6) and (7). Note that out of this pair of particles, only *atu* can occur with degree predicates. Whereas the use of *atu* indicates movement along a path away from a contextually provided reference location, the use of *mai* requires movement along a path in the direction of that location.

- (6) Savali mai le matai ma opo atu Tavita ma Sieni.
walk hither the chief and embrace away Tavita and Sieni.
'The village chief enters and Tavita and Sieni greet him with a hug.'

- (7) a. Faatau mai ni fa'i.
exchange hither INDEF.DET.pl. banana
'Buy some bananas.'
(Milner 1966, 247)
- b. Faatau atu talo.
exchange away taro
'Sell taro.'
(Milner 1966, 247)

This is also illustrated in the diagram below, with X indicating the reference location and the grey rectangle the path of movement. The initiation point as well as the termination point of the movement path are indicated by arrows.

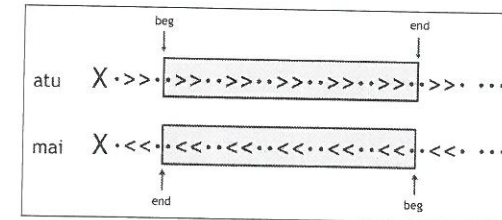


Figure 0.1: Directed motion with *atu* ('forth, away') and *mai* ('hither, hereto')

Further examples of Samoan motion verbs with *atu* are provided in (8) to (11) below. A measure phrase can be used to indicate by how much movement has progressed along the path, as was illustrated by the example in (4) above. Another example where the difference measure is overtly provided is in (9). Notice that directed motion verbs with *atu* additionally allow for Prepositional Phrases specifying the goal or source of the movement, as is illustrated in (10) and (11).

- (8) Ua ō atu Sina ma Tigilau.
TAP go(pl.) away Sina and Tigilau
'Sina and Tigilau went away.'
(Mosel and Hovdhaugen 1992, p. 145, no. (4.401), my glosses)
- (9) Sa aau atu Ioane i le sefulu mita.
TAP swim away John PREP. the ten meter
'John swam ten meters away.'
- (10) Ua sosola atu 'i Tutuila, ...
TAP flee(pl.) away to Tutuila
'They ran away to Tutuila, ...'
(Mosel and Hovdhaugen 1992, p. 348, no. (9.91), my glosses)
- (11) Ua malaga atu Malia mai Niu Sila 'i Saina.
TAP travel away Mary from New Zealand to China
'Mary travelled from New Zealand to China.'

Directed motion verbs with *atu* locate the subject as having progressed by some or an overtly provided amount on a path that is directed away from the reference location.

2.2 Separative Comparatives

Comparatives with *atu* on the other hand locate the subject as by some or an overtly specified amount further on the respective scale than the standard of comparison:

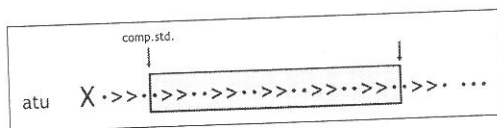


Figure 0.2: Comparison with *atu* ('forth, away')

In Samoan, this standard of comparison is introduced by a Prepositional Phrase. We find *ia* with proper names and *i lo* with definite descriptions, e.g. (12) and (13). The preposition *ia* is in complementary distribution with *i lo*, cf. (14). The preposition *i* also marks the direct object of a verb, cf. (15), and I will therefore consider it to be semantically vacuous. Its presence is due to syntactic reasons.

- (12) E mamafa atu Malia **ia** Ioane.
TAP heavy away Mary PREP. John
'Mary is heavier than John.'
- (13) E umi atu Malia **i lo** lona uso.
TAP tall away Mary PREP. PART. POSS.3.sg. sister
'Mary is taller than her sister.'
- (14) *E umi atu Malia **ia lo** Ioane.
TAP tall away Mary PREP. PART. John
'Mary is taller than John.'
- (15) E alofa le tama **i** le teine.
TAP love the boy PREP. the girl
'The boy loves the girl.'
(Mosel and Hovdhaugen 1992, p. 428, no. (9.91), my glosses)

For English and German, the question of how to analyse the *than*-constituents in sentences like (16) has been subject to a controversial debate; cf. also Hofstetter (this volume).

- (16) Mary is taller than John.

One possibility is to derive (16) from a clausal source via ellipsis and then apply the same semantic analysis as for clausal comparatives, a reduction analysis. Under a direct analysis, however, interpretation applies to the structure visible at the surface (cf. e.g. Heim 1985). In Samoan, evidence for a direct, phrasal analysis of the comparative comes from the ungrammaticality of sentences such as (17). A grammatical alternative to (17) is (18).

- (17) *E mauloa Malia **i lo** sa faapea au.
TAP rich Mary PREP. PART. TAP suppose PRN.1sg.
'Mary is richer than I thought.'
(Villalta 2007a, p. 5, no. (10c), my glosses)
- (18) E mauloa atu Malia **i lo** le mea
TAP rich DIR. Mary PREP. PART. the thing
na ou faapea e **i** ai.
TAP PRN.1sg. suppose TAP PREP. PRN.
'Mary is richer than the wealth which I supposed her to have.'
(Villalta 2007a, p. 5, no. (10b), my glosses)

Evidence for a degree-based analysis of this comparative construction comes from the availability of comparison with a degree as in (19) and from the availability of differential measure phrases as in (5) in the introduction, repeated as (20) below. (The reader is referred to Beck et al. (2009) and Beck (2011) for a detailed discussion of the significance of these particular constructions.) Note that *lo* is not required in (19).

- (19) E umi atu Malia **i le lima** futu.
TAP tall away Mary PREP. the five foot
'Mary is taller than five foot.'
- (20) E umi atu Malia **i le lua inisi** i lo lona uso.
TAP tall DIR. Mary PREP. the two inch PREP. PART. POSS.3.sg. sister
'Mary is two inches taller than her sister.'

Before turning to the analysis, let me briefly point out a structural difference between directed motion verbs and comparatives: Prepositional Phrases with *i lo* and *ia*, specifying the standard of comparison, are limited to the comparative. With motion verbs, the majority of my consultants finds them unacceptable. This is illustrated in (21) and (22).

- (21) ??Sa savali atu Malia **i lo** lona uso.
TAP walk DIR. Mary PREP. PART. POSS.3.sg. sister
'Mary walked further than her sister.'
- (22) ?Sa savali atu Malia **i le lua kilomita** i lo lona uso.
TAP walk DIR. Mary PREP. the two kilometer PREP. PART. POSS.3.sg. sister
'Mary walked two kilometers further than her sister.'

If directed motion verbs indeed involve a comparison, the standard of comparison must already be implicitly present. Trying to overtly specify the standard of comparison therefore leads to uninterpretability.

The table on the next page repeats the informal paraphrases discussed in the previous two sections for sentences with directed motion verbs and for separative comparatives. In both constructions, a measure phrase may specify the exact amount of difference.

DIRECTED MOTION VERBS:	SEPARATIVE COMPARATIVES:
'There is a certain amount by which the subject progresses along some path of movement which is directed away from the reference location.'	'There is a degree by which the subject exceeds the standard of comparison along a certain dimension.'

The main idea of an analysis that captures the above intuitions is simple: In Samoan, verbs of directed motion with *atu* involve a comparison, just as comparatives with *atu* do. I will start with the comparative, as this will provide the opportunity to reflect on the notion of degree, a key ingredient of the semantic analysis of comparison.

3. The Analysis

3.1 A Degree-Based Analysis of Separative Comparatives

Introducing the notion of degree and a corresponding type $\langle d \rangle$ helps us to capture the intuition that "... when we make comparisons we have in mind points on a scale" (Cresswell 1976, 266). Degrees are "highly abstract entities" (von Stechow 1984, 47) that are elements of scales. Scales consist of a set and a total ordering relation on that set.

- (23) a. Call each pair $\langle S, >_S \rangle$, consisting of a set S and an order $>_S$, a scale.
- b. The order $>_S$ is irreflexive, asymmetric, transitive (and thus strict), as well as connected (and thus total).

The denotation domain of degrees, $D_{\langle d \rangle}$, is the union of all mutually disjoint sets of degrees. Each set comes with its own ordering relation. The reason for assuming such abstract objects is that there are expressions that operate on them. In the analysis of Samoan, one of these expressions is the comparative in the shape of the particle *atu*, which I suggest has the lexical entry in (24) below. A definition of the maximality operator is in (25).

- (24) $\llbracket \text{atu}_i \rrbracket = \lambda R_{\langle d, \langle e, t \rangle \rangle} . \lambda d'_{\langle d \rangle} . \lambda d_{\langle d \rangle} . \lambda x_{\langle e \rangle} . \max(\lambda d . R(d)(x)) \geq d + d'$
- (25) $\llbracket \text{max} \rrbracket = \lambda D_{\langle d, t \rangle} . \iota d [D(d) \ \& \ \forall d' [D(d') \longrightarrow d' \leq d]]$

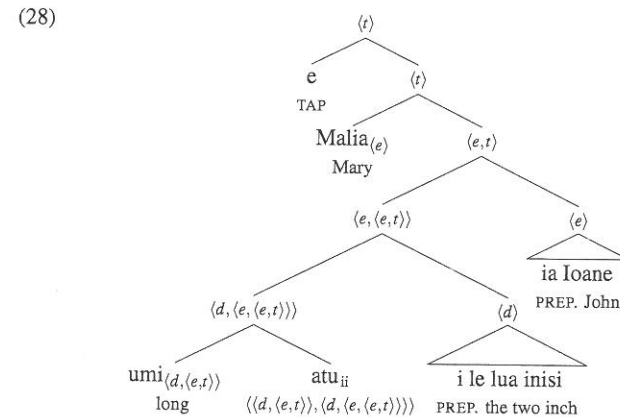
This is a perfectly well-behaved phrasal comparative operator that has among its arguments the degree specifying the standard of comparison and a differential degree argument. It maps them onto true if the maximal degree to which x is R exceeds the standard of comparison d by degree d' . When not comparing directly with a degree but two individuals along the dimension provided by the gradable predicate, Samoan employs the comparative operator below. In combination with this lexical entry, *i lo*-phrases simply contribute the denotation of their overt material.

- (26) $\llbracket \text{atu}_{ii} \rrbracket = \lambda R_{\langle d, \langle e, t \rangle \rangle} . \lambda d'_{\langle d \rangle} . \lambda y_{\langle e \rangle} . \lambda x_{\langle e \rangle} . \max(\lambda d . R(d)(x)) \geq \max(\lambda d . R(d)(y)) + d'$

Comparative *atu_{ii}* maps its argument onto true if and only if the maximal degree to which x is R exceeds the maximal degree to which y is R by degree d . Let us take a brief look at

these two operators at work. The comparative in (27) below, a slightly simplified version of the example in (20) above, has the Logical Form in (28).

- (27) E umi atu Malia i le lua inisi ia Ioane.
TAP long DIR. Mary PREP. the two inch PREP. John
'Mary is two inches taller than John.'



Just as gradable predicates in English, *umi* ('long') denotes a relation between a degree and an individual. At the core of its meaning is a measure function of type $\langle e, d \rangle$ which maps an individual to the maximal degree to which it is long. With this particular lexical item, length as well as height degrees are acceptable.

- (29) $\llbracket \text{umi} \rrbracket = \lambda d_{\langle d \rangle} . \lambda x_{\langle e \rangle} . \text{HEIGHT}(x) \geq d$

However, Samoan gradable predicates differ from their English counterparts in that they come with a – crosslinguistically very common – syntactic restriction on their degree argument slot, which can be couched in terms of a negative setting of the Degree Phrase Parameter in (30) below. The Samoan equivalent of the English measure phrase construction is thus ungrammatical, compare (31) and (32).

- (30) Degree Phrase Parameter:
The degree argument position of a gradable predicate {may/may not} be overtly filled.
(Beck et al. 2009, p. 24, no. (84))

- (31) Mary is five foot tall.
- (32) *E umi Malia i le lima futu.
TAP long Mary PREP. the five foot
'Mary is five foot tall.'

I take measure phrases in Samoan to be of type $\langle d \rangle$ and to refer directly to a degree. The example in (27) then receives the interpretation in (33) below. The sentence is true just in case Mary's height exceeds John's height by two inches.

- (33) $\llbracket (27) \rrbracket = 1$
 iff $\max(\lambda d. \text{HEIGHT}(\text{Mary}) \geq d) \geq \max(\lambda d. \text{HEIGHT}(\text{John}) \geq d) + 2 \text{ in}$
 iff $\text{HEIGHT}(\text{Mary}) \geq \text{HEIGHT}(\text{John}) + 2 \text{ in}$

In those cases where the difference measure is not overtly provided, existential closure quantifies off the degree argument, as is illustrated for the example in (34) in (35). The interpretation of (34) relies on atu_i , which takes two degree arguments. The sentence is true if and only if there is a degree d' and Mary's height exceeds five feet by d' .

- (34) E umi atu Malia i le lima futu.
 TAP tall away Mary PREP. the five foot
 'Mary is taller than five foot.'
- (35) $\llbracket (34) \rrbracket^g = 1$
 iff $\exists d' [\max(\lambda d. \text{HEIGHT}(\text{Mary}) \geq d) \geq 5 \text{ ft} + d']$
 iff $\exists d' [\text{HEIGHT}(\text{Mary}) \geq 5 \text{ ft} + d']$

Let me add a couple of remarks before we turn to the interpretation of directed motion verbs. Note that the lexical entry suggested for the comparative differs from the phrasal comparative operators in the literature (e.g. Bhatt and Takahashi 2007, to appear) in the way it is *schoenfinkeld*. It requires a degree predicate as its sister and is unable to undergo movement; cf. Hohaus et al. (2010, 34-40) for a more detailed discussion of the differences in the light of data from first language acquisition.

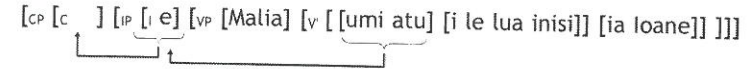
The two lexical entries for *atu* above differ with respect to the semantic type of one of their arguments. This difference is reflected in the Prepositional Phrases that introduce the argument. When the argument is of type $\langle e \rangle$, we find *ia* or *i lo*. When the argument is of type $\langle d \rangle$, only the preposition *i* is sufficient. Hohaus (2010) therefore discusses the possibility that *-a* and *lo* contribute a type shift from individuals to degrees, i.e. that they introduce a free variable f of type $\langle e, d \rangle$, a value for which has to be provided by the context. Consider (36).

- (36) $\llbracket -a \rrbracket^g = \llbracket lo \rrbracket^g = \lambda x_{\langle e \rangle}. f(x)$

Under such an account, we could do with atu_i , which is of type $\langle \langle d, \langle e, t \rangle \rangle, \langle d, \langle d, \langle e, t \rangle \rangle \rangle$. The idea of a mapping function from individuals to degrees has also been contemplated by Oda (2008) and Hayashishita (2009) for Japanese, and by Hofstetter (this volume) for Turkish. As the *i lo*-phrase does not exhibit the interpretative flexibility of its Japanese or Turkish counterparts, there is little evidence in favor of one analysis or the other.

My last remark concerns the surface structure of Samoan comparatives. VSO at surface is derived by obligatory I-to-C movement of the verb, as suggested for Tongan in Otsuka (2000) and for Tagalog in Aldridge (2004).

The comparative in (27) is no exception:



Let us return to one of the main questions: How did *atu* ('forth, away') come to be used with the comparative meaning we just discussed?

3.2 Directed Motion as Comparison of Locations along a Path

Intuitively, directed motion involves a movement along a path, a set of locations. For the example in (37), repeated from (9) above, John – by swimming – has moved ten meters along a path which is directed away from a contextually provided reference location.

- (37) Sa aau atu Ioane i le sefulu mita.
 TAP swim away John PREP. the ten meter
 'John swam ten meters away.'

Yet, sentences like (37) and comparatives share a conceptual structure:

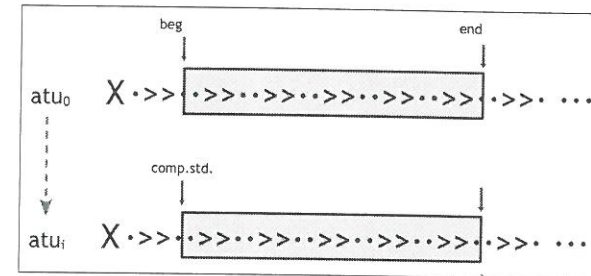


Figure 0.3: The common conceptual core of directed motion and comparison

Whereas comparison is between two degrees on some scale in the one case, it is between two locations along a directed one-dimensional path in the other case. The table below identifies the corresponding items in both constructions.

DIRECTED MOTION:	COMPARISON:
beginning of the path of an object	standard of comparison
end of the path of an object	maximal degree to which an object has some gradable property
difference degree	difference degree
set of locations and total ordering relation	scale associated with gradable predicate

Just as times, locations are primitives in the universe of discourse. They have the semantic type $\langle l \rangle$. Places are spatial areas, and any "... physical object occupies a particular place at each moment of its existence" (von Stechow 2006, 10). The path of an object during a particular time span is the set of places that the object has occupied during that time (cf. e.g. Cresswell 1978). And indeed, as von Stechow (2006, 11) puts it: "There is nothing mysterious with paths." Locations can play a double conceptual role and can be understood as degrees. This is a particularity I propose they share with times (cf. von Stechow 2009).

Recall from the discussion in the previous section that we take degrees to be elements of scales, with a scale consisting of a set and a total ordering relation on that set. The path of some object may correspond to a scale if there is an ordering relation on the set of contiguous points of locations it provides. In our case, it is the job of the contextually provided reference location, often the utterance location, to provide the zero point of the scale and thus an anchoring place for the ordering relation: For any pair of locations $\langle l, l' \rangle$ that is an element of the Cartesian product of the set of locations of the path in question, if l' is reached later than l , then l' is farther away from the reference location than l .

In what follows, a scale consisting of this particular ordering relation and the aforementioned set will be referred to as \mathfrak{P} . Just as the height scale comes with an associated measure function HEIGHT, which maps an individual to its maximal extent on the scale, \mathfrak{P} is associated with the measure function p . Corresponding dimensions for measurement for this scale are measures for spatial distances such as miles and kilometers. In the original version of *atu*, referred to below as *atu*_o, the measure function p has been incorporated into the lexical entry. The scale along which comparison takes place is indicated by a subscript.

$$(38) \quad \llbracket \text{atu}_o \rrbracket = \lambda d_{\langle d \rangle} . \lambda x_{\langle e \rangle} . \max(\lambda d . p(x) \geq d) \geq_{\mathfrak{P}} \min(\lambda d . p(x) \geq d) + d'$$

The lexical entry for *atu*_o in (38) above is of type $\langle d, \langle e, t \rangle \rangle$. (Clearly, we will want this item to have a temporal argument in the end. I'm neglecting this here.) *Atu*_o is true of a degree d' and an individual x if the degree the measure function p assigns to the individual exceeds the minimal degree in the set of degrees smaller or equal to the degree that p assigns to x by d' . Let us ponder on the meaning of this for a moment. On our setup, p assigns to x the maximal degree on \mathfrak{P} : This degree is also a location, namely the endpoint of x 's path of movement. The minimal degree in the set of degrees smaller or equal to the degree that p assigns to x is likewise a location, namely the initiation point of the path. The minimality operator in (38) is defined as in (39).

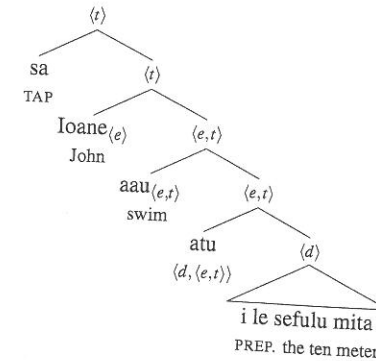
$$(39) \quad \llbracket \min \rrbracket = \lambda D_{\langle d, t \rangle} . \lambda d [D(d) \ \& \ \forall d' [D(d') \longrightarrow d' \geq d]]$$

Let us put *atu*_o to work. A Logical Form for the example in (37) above is provided in (41) on the next page. After having combined with the degree argument, *atu* combines with the verb via predicate modification. Interpreting the Logical Form in (41) will result in the desired truth conditions, provided in (40) below.

$$(40) \quad \llbracket (37) \rrbracket = 1 \\ \text{iff swim}(\text{John}) \ \& \ \max(\lambda d . p(\text{John}) \geq d) \geq_{\mathfrak{P}} \min(\lambda d . p(\text{John}) \geq d) + 10m \\ \text{iff swim}(\text{John}) \ \& \ p(\text{John}) \geq_{\mathfrak{P}} \min(\lambda d . p(\text{John}) \geq d) + 10m$$

Notice that comparison in this case is a comparison between the minimal and maximal elements of the same set, and thus between the initiation and the final point of the motion path. Again, existential closure will take care of the degree argument in the case of examples such as (8) earlier on, where the measure of difference is not overtly provided.

(41)



Before I turn to the relation between *atu*_o and *atu*_{i/hi}, let me briefly discuss the relationship of the above proposal to some of the literature. The general idea that verbs of directed motion involve a difference comparative has also been put forward by Hay et al. (1999) and by Kennedy and Levin (2008), to mention the most prominent proposals. Both propose semantic analyses of the aspectual properties of degree achievements in English which, too, make crucial use of the idea of an operator at the core of which is a differential: Hay et al. (1999, p. 132, no. (16)) posit INCREASE which is true of a gradable property, an individual, a degree and an event just in case the degree to which the individual has the gradable property at the beginning of the event plus the degree equals the degree to which the individual has the gradable property at the end of the event. Kennedy and Levin (2008, p. 18, no. (25)) introduce a "measure of change," defined as in (42) below.

$$(42) \quad \text{For any measure function } f, f_{\text{Diff}} = \lambda x_{\langle e \rangle} . \lambda t_{\langle t \rangle} . f_{f(x)(\text{beg}(t))}^{\uparrow}(x)(\text{end}(t))$$

The definition in (42) employs a different notation and comes with a slightly different assumption about the semantic type of gradable adjectives, for which the type $\langle e, d \rangle$ is adopted. It is nevertheless a differential comparative. Notice that both operators rely on temporal information to arrive at the minimal and maximal elements in the set of difference degrees. Under such an account, the parallel to the difference comparative proper is slightly less transparent.

Based on the parallel aspectual behavior of degree achievements and directed motion verbs in English, Hay et al. (1999, 139-142) then hypothesize that their analysis of degree achievements in English can be extended to directed motion verbs. Kennedy and Levin (2008, 26), too, conclude: "It therefore remains to be shown that our proposals will extend to the other classes of verbs as well. In the case of directed motion verbs... we believe that the account we have presented here carries over entirely: such verbs encode

measure of change functions over scales that measure directed movement along a path. While they do not always have corresponding adjectival forms, the kinds of meanings they express are identical to the kind of meanings we have described here for verbs directly related to gradable adjectives." Though not a direct extension of their analyses, the analysis of Samoan presented above shows in a very explicit and compositional manner that directed motion verbs can successfully be analyzed as difference comparatives.

4. Discussion

Nevertheless, the analysis relies on a set of closely related operators rather than on one lexical entry. Evidence about the historical development of these different nuances in the meaning of *atu* is hard to come by. Ross (2004, 311–314) observes that many of the directional particles in the Oceanic languages were once directional movement verbs in serial verb constructions. Various authors furthermore comment on language change in the Samoan comparative (cf. e.g. Marsack (1975, 66–67) and Villalta (2007b, 2)). Stassen (1985, 330–331) expresses the view that the comparative in its present form is a "...relatively recent innovation and that the original Polynesian comparative is a conjoined comparative." However, conjoined comparatives such as (43) are rejected by many of my consultants as inadequate means of expressing comparison.

- (43) #E maualuga Alofa ae puupuu Sulu.
TAP high Alofa but small Sulu
'Alofa is tall but Sulu is small.'

The extension of the use of *atu*_o to the comparative involves two plausible changes: First, an extension to other gradable predicates of type $\langle d, \langle e, t \rangle \rangle$, and second, a move away from the minimal degree in the set of degrees smaller or equal to the degree that *p* assigns to *x* to an open degree argument. Two very simple changes to the argument structure thus allow to derive (45) from (44).

$$(44) \quad \llbracket \text{atu}_o \rrbracket = \lambda d_{\langle d \rangle} \cdot \lambda x_{\langle e \rangle} \cdot \max(\lambda d. p(x) \geq d) \geq_p \min(\lambda d. p(x) \geq d) + d'$$

$$(45) \quad \llbracket \text{atu}_i \rrbracket = \lambda R_{\langle d, \langle e, t \rangle \rangle} \cdot \lambda d'_{\langle d \rangle} \cdot \lambda d_{\langle d \rangle} \cdot \lambda x_{\langle e \rangle} \cdot \max(\lambda d. R(d)(x) \geq d + d')$$

$$(46) \quad \llbracket \text{atu}_{ii} \rrbracket = \lambda R_{\langle d, \langle e, t \rangle \rangle} \cdot \lambda d'_{\langle d \rangle} \cdot \lambda y_{\langle e \rangle} \cdot \lambda x_{\langle e \rangle} \cdot \max(\lambda d. R(d)(x) \geq \max(\lambda d. R(d)(y)) + d')$$

From there, a comparative operator that compares two individuals along the dimension specified by the degree predicate, as in (46), is easy to deduce. (The latter step in fact is one that Hohaus et al. (2010, 34–40) identify for the acquisition path of the English phrasal comparative as well.) I take the availability of both, *atu*_o and *atu*_{ii} in contemporary Samoan to explain the diverse judgments in the case of (21) and (22). Some speakers seem to be able to use *atu*_{ii} with motion verbs, thereby enabling them to overtly specify a standard of comparison. I assume a covert gradable property in those cases.

To sum up, I have argued for an analysis of the semantics of *atu* under which it always expresses degree comparison. When building directed motion predicates with *atu*_o,

the locations included in the path of motion are conceptualized as degrees on a scale. On that scale, *atu*_o compares the endpoint of the path of movement to its initial point. In comparatives, *atu*_i express a comparison between the maximal degree to which the subject has some gradable property and an overtly provided degree, while *atu*_{ii} compares two individuals with respect to the maximal degree to which they have some gradable property.

Under this account, the crosslinguistic pervasiveness of separative comparatives is quite expected. The data furthermore provide support for a scalar approach to directed motion verbs as envisioned by Hay et al. (1999) and Kennedy and Levin (2008). In the light of the Samoan data discussed above, such an analysis is not only plausible but, as we have seen, it is also feasible. Starting point of much of the research on scalarity in the meaning of degree achievements, incremental theme verbs and verbs of directed motion is the variable telicity of those verbs in English. The aspectual behavior of directed motion verbs in Samoan is thus a possible direction for future research.

References

- Aldridge, Edith. 2004. Ergativity and word order in Austronesian languages. Doctoral Dissertation, Cornell University.
- Beck, Sigrid. 2011. Comparison constructions. In *Semantics: An international handbook of natural language meaning*, ed. Claudia Maienborn, Klaus von Stechow, and Paul Portner, volume 2. Berlin: De Gruyter.
- Beck, Sigrid, Svetlana Krasikova, Daniel Fleischer, Remus Gergel, Stefan Hofstetter, Christiane Savelsberg, John Vanderelst, and Elisabeth Villalta. 2009. Crosslinguistic variation in comparison constructions. *Linguistic Variation Yearbook* 9:1–66.
- Bhatt, Rajesh, and Shoichi Takahashi. 2007. Direct comparisons: Resurrecting the direct analysis of phrasal comparatives. In *Proceedings of Semantics and Linguistic Theory 17*, ed. Masayuki Gibson and Tova Friedman, 19–36.
- Bhatt, Rajesh, and Shoichi Takahashi. to appear. Reduced and unreduced phrasal comparatives. *Natural Language and Linguistic Theory*.
- Bogal-Allbritten, Elizabeth. 2008. Gradability and degree constructions in Navajo. Honors Thesis, Swarthmore College, Dec. 2008.
- Cresswell, Max J. 1976. The semantics of degree. In *Montague grammar*, ed. Barbara Partee, 261–292. New York: Academic Press.
- Cresswell, Max J. 1978. Prepositions and points of view. *Linguistics and Philosophy* 2:1–41.
- Hay, Jennifer, Christopher Kennedy, and Beth Levin. 1999. Scalar structure underlies telicity in degree achievements. In *Proceedings of Semantics and Linguistic Theory* 9, 127–144.
- Hayashishita, J.-R. 2009. Yori-comparatives: A reply to Beck et al. (2004). *Journal of East Asian Linguistics* 18:65–100.
- Heim, Irene. 1985. Notes on comparatives and related matters. Manuscript, University of Texas at Austin, May 1985.

- Hohaus, Vera. 2010. The semantics of motion verbs and comparison in Samoan. Magisterarbeit, Eberhard Karls Universität Tübingen.
- Hohaus, Vera, Sonja Tiemann, and Sigrid Beck. 2010. Acquisition of comparison. Manuscript, Eberhard Karls Universität Tübingen, March 2010.
- Kennedy, Chris, and Beth Levin. 2008. Measure of change: The adjectival core of degree achievements. In *Adjectives and adverbs: Syntax, semantics and discourse*, ed. Louise McNally and Chris Kennedy, 156–182. Oxford: Oxford University Press.
- Marsack, C. C. 1975. *Samoan*. Norwich: The English Universities Press, 4th edition.
- Matthewson, Lisa. 2004. On the methodology of semantic fieldwork. *International Journal of American Linguistics* 70:369–451.
- Matthewson, Lisa. 2011. Methods in crosslinguistic formal semantics. In *Semantics: An international handbook of natural language meaning*, ed. Claudia Maienborn, Klaus von Heusinger, and Paul Portner, volume 1, 268–284. Berlin: De Gruyter.
- Milner, George B. 1966. *Samoan dictionary*. London: Oxford University Press.
- Mosel, Ulrike, and Even Hovdhaugen. 1992. *Samoan reference grammar*. Oslo: Scandinavian University Press.
- Oda, Toshiko. 2008. Degree constructions in Japanese. Doctoral Dissertation, University of Connecticut.
- Otsuka, Yuko. 2000. Ergativity in Tongan. Doctoral Dissertation, University of Oxford.
- Ross, Malcom. 2004. The grammaticization of directional verbs in Oceanic languages. In *Complex predicates in Oceanic languages*, ed. Isabelle Brill and Françoise Ozanne-Rivierre, 297–330. Berlin: De Gruyter.
- Stassen, Leon. 1985. *Comparison and universal grammar*. Oxford: Basil Blackwell.
- von Stechow, Arnim. 1984. Comparing semantic theories of comparison. *Journal of Semantics* 3:1–77.
- von Stechow, Arnim. 2006. Spatial prepositions in interval semantics. Handout, Semantic Network, Barcelona, Sept. 2006.
- von Stechow, Arnim. 2009. The temporal degree adjectives *Früh(er)/ Spät(er)* ('early(er)'/ 'late(r)') and the semantics of the Positive. In *Quantification, definiteness and nominalization*, ed. Anastasia Giannakidou and Monika Rathert, 214–233. Oxford: Oxford University Press.
- Villalta, Elisabeth. 2007a. Fragebogen zu Komparativen im Samoan. Handout, Eberhard Karls Universität Tübingen, July 2007.
- Villalta, Elisabeth. 2007b. Komparative im Samoan. Handout, Eberhard Karls Universität Tübingen, July 2007.

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Temporal and Aspectual Reference in Bassila Anii*

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1. Introduction

This paper explores temporal and aspectual reference in Anii, a severely under documented West African Kwa language spoken in Togo and Benin. In particular, it describes and analyzes clauses with non-future perfective and imperfective aspectual reference. The data given here illustrate the importance of taking into account Aktionsarten in the interpretation of temporal and aspectual reference in Anii.

The majority of Anii clauses (79 out of 120) in the small corpus used for this paper contain no tense or aspect markers. Such clauses are referred to in this paper as 'unmarked clauses'. For example, the clause in (1) consists only of the (class C¹) noun, *gái*² 'hornbill', which is the subject, a (class C) noun class agreement marker *ga* and a verb, *ɖɛ* 'eat', with no other verbal morphology present. As will be shown below, clauses such as (1) have past perfective interpretation:

- (1) Context: what did the hornbill do yesterday?
 ga-tɪ ga ɖɛ ɸ-ɖɛ³
 CL.C-hornbill AGR.CL.C eat CL.E-food
 'The hornbill ate.'

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¹ As in many African languages, Anii nouns are divided into noun classes, and all verbs require subject agreement by noun class, for example the agreement marker *ga* in (1).

² Tone transcriptions given here are phonetic rather than phonemic, since an analysis of the Anii tone system has not yet been completed. High tone is indicated by an accent, low tone by lack of accent, and downstep by an exclamation point.

³ Abbreviations used in this paper: AGR = Agreement (based on noun class), CL = Noun Class (Anii noun classes are identified by letter), FOC = Focus, FUT = Future, IMPF = Imperfective, OBJ = Object, PL = Plural, POSS = Possessive, PST = Past, REL = Relativizer, SG = Singular, 1 = 1st person, 2 = 2nd person