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CHAPTER 17

Degree modifiers and scalar meanings of projective grams

Tuomas Huumo

ABSTRACT: Some projective grams (adpositions or adverbs) have scalar meanings, making them subject to modification by degree modifiers (DM). DMs indicate either an open scale ("rather," "very") or a closed one ("almost," "quite"). Projective grams localize Figure with respect to Ground in a three-dimensional axis system. Finnish projective grams take open-scale DMs in a field-based (absolute) frame of reference (FoR), with Figure inside an encompassing Ground. Origin-centric (intrinsic or relative) FoRs localize Figure outside Ground, and allow only DMs of a closed scale. The scalar meanings expressed may relate 1) to the distance between Figure and Ground; 2) to Figure's deviation from an axis, or 3) (in the field-based FoR) to the distance between Figure and one extreme of the inside of the Ground (for example the rear wall of an auditorium). In motion scenarios with Figure and Ground moving in the same direction, scalar meanings relate to Figure's degree of advancement compared to Ground.

Keywords: degree modifier; spatial gram; adposition; scalar meaning; frame of reference; Finnish

1. Introduction

Since the groundbreaking works of Bolinger (1967, 1972), the semantics of degree modifiers (DM) has received considerable attention in both formal and cognitive–functional linguistics. Most studies have focused on the main function of DMs as adjective modifiers (e.g., Kennedy, 1997; Kennedy and McNally, 2005; in cognitive linguistics, most notably Paradis, 1997, 2001, 2008). More recently, the functions of DMs as modifiers of quantifiers (Njende et al., 2017) and verbs

(Fleischhauer, 2016) have been analyzed in detail. To my knowledge, no detailed analysis has been conducted on scalar meanings of spatial grams (i.e., multi-functional grammatical words, in the sense of Svorou, 1994) and their modification by degree modifiers. Talmy (2017: 315), however, points out that English has a few prepositions with a scalar meaning, which can be highlighted by DMs. Talmy proposes a distinction between *centripetal* and *centrifugal* prepositions: when used with a centripetal preposition, an intensifier (the DM) locates the Figure closer to the Ground[1] (e.g. *very near*) while with a centrifugal preposition it locates it further away (e.g. *way above*). Taking Talmy's observation as a starting point, I illustrate the scalar meanings of spatial grams with a case study on Finnish projective grams.

Many kinds of spatial grams in Finnish allow modification by DMs (Huumo, 2021). The scalar meanings expressed vary according to whether the gram is used as an adverb (without an overt Ground, as in "The shop is near") or as an adposition (with an overt Ground, which is grammatically the complement of the adposition, as in "The shop is near the station"). If the latter is the case, then it is also relevant whether the adposition is (used as) a preposition or a postposition, and whether it marks the Ground with the genitive or partitive case. Some Finnish adpositions are rigid in this respect, while others are flexible and allow both genitive and partitive Grounds, sometimes expressing different scalar meanings. The grammatical construction in which the gram is used thus also contributes to the gram's semantics and its ability to take different DMs as modifiers. Such grammatical diversity is most likely due to Finnish grams' being a semi-open word class, with both more and less grammaticalized elements; many of these go back historically to adverbs or nouns,

[1] I use the terms *Figure* and *Ground* (see Talmy, 2000: Ch. 5) respectively for the entity to be located and for the entity with respect to which the Figure is located. In grammatical terms, the Ground in an adpositional construction is expressed by the complement of the adposition. If the gram is used as an adverb without an overt complement, the Ground remains implicit and is typically inferable from the linguistic or extralinguistic context. The Figure is typically an entity indicated by another clausal element, such as the grammatical subject or object. If the adpositional phrase expresses a setting, the Figure is a full situation with all its participants.

and can still be used in those functions as well (see Grünthal, 2003 for a detailed historical account). That is also why the term *gram*, coined by Svorou (1994), is well suited to these elements.

2. A cognitive-semantic classification of degree modifiers

Degree modifiers (DM) are words that modify other words, such as adjectives or adverbs, by specifying their scalar meanings (see e.g. Paradis, 1997; 2001; Kennedy and McNally, 2005). A precondition for the modification is that the meaning of the modified element is in some sense gradable. A DM then specifies the position of an entity or a relationship on the relevant scale. The meaning of gradable words involves a *standard* (also called a *norm*) to which the specified degree relates. For an entity to count as *very beautiful*, for example, it is not sufficient that it surpass the standard of being "beautiful"; it must have that property to a higher degree than most "beautiful" entities of the same relevant class.

The scale to which a DM relates can also be closed (see Paradis, 1997, 2001; Kennedy and McNally, 2005). A closed scale has a minimum and a maximum value (e.g., *empty – full*), while an open scale lacks these (e.g., *ugly – beautiful*). According to Kennedy and McNally (2005), adjectives such as *full*, *closed* and *invisible* represent closed scales, while *long*, *expensive*, and *old* represent open scales. Some scales are open at one end but closed at the other; for example, the adjectives *quiet* and *unknown* illustrate scales that are closed at their lower end only, while *certain* and *pure* illustrate scales closed at their upper end only (Kennedy and McNally, 2005: 352–355). Since metaphorical notions, such as *lower* and *upper*, may be misleading in a discussion of spatial grams (the concrete vertical dimension may be at issue), I will refer to a boundary at the lower end of a scale as its *minimal-degree boundary*, and one at the upper end of the scale as the *maximal-degree*

boundary. These notions are purely scalar and are to be kept apart from spatial notions, such as (for example) the inner and outer boundaries of a gram's search domain.[2]

Like adjectives, DMs comprise two scalar main types: those that relate to an open scale (e.g., the English *somewhat*, *rather*, *very*, *extremely*) and those that relate to a closed scale (*almost*, *quite*, *totally*). Paradis (1997: 28) calls the former *scalar modifiers* and the latter *totality modifiers*. She argues that both groups consist of two subclasses: *attenuating* DMs, which indicate a degree below a norm, and *reinforcing* DMs, which indicate a degree above a norm. Reinforcing open-scale DMs are called BOOSTERS. English BOOSTERS include, for instance, *very*, *terribly* and *extremely*; their function is to reinforce the property modified (Paradis, 2008: 321). Attenuating open-scale DMs comprise two subclasses: MODERATORS, expressing a moderate (neither high nor low) degree, such as *rather*, *pretty* and *fairly*, and DIMINISHERS, expressing a low degree; examples are *slightly* or *somewhat* (Paradis, 2008: 321). Totality modifiers, on the other hand, relate to a closed scale. They include reinforcing MAXIMIZERS (such as *completely* or *totally*), and attenuating APPROXIMATORS (such as *almost*). According to Paradis, MAXIMIZERS highlight a perfect match with a maximum or a boundary, while APPROXIMATORS mean that a gradable property falls short of that maximum or boundary (for APPROXIMATORS, see also Radden and Dirven, 2007: 118).

In the following I apply Paradis's (1997, 2008) classification to Finnish DMs, with the addition of two subclasses of totality modifiers, referred to as FOCUSERS and DELIMITERS. A FOCUSER either specifies or obscures a precise scalar value, as in *The child was exactly three-year-old* vs. *These two words are approximately synonymous*. DELIMITERS are DMs that resemble MAXIMIZERS but are able to modify scalar elements on both open and closed scales, evoking different meanings. An example of a DELIMITER (in my terminology) is the English *quite*, which, according to Paradis (1997, 2008) functions as a MAXIMIZER in closed-scale expressions (e.g., *The bottle is quite empty*),

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[2] *Search domain* is a term in Cognitive Grammar (e.g., Langacker, 1987: 177); it refers to "the region to which a locative predication confines its trajector" (trajector being the approximate counterpart of Talmy's Figure).

but as a MODERATOR in open-scale expressions (e.g., *The teacher was quite young*; see Paradis, 1997: 17–18, 2008: 337 and the literature cited there).

The above classification of English DMs applies relatively well to Finnish DMs. Table 17.1 (from Huumo, 2021) lists the Finnish DMs to be analyzed in the following, and gives their (approximate) English translations.

Table 17.1. Classification of Finnish DMs (from Huumo, 2021).

	Open-scale DMs	Closed-scale DMs
Attenuating	Diminishers: *hiukan*, *vähän* "somewhat; (a) little"	Approximators: *melkein* "almost"
	Moderators: *melko*, *aika*, *kohtalaisen* "rather; somewhat; relatively" Delimiters: *ihan*, *aivan* "quite"	
Reinforcing	Boosters: *hyvin*, *erittäin* "very, extremely"	Maximizers: *täysin*, *täydellisen* "completely, perfectly, totally" Delimiters: *ihan*, *aivan* "quite"
Others		Focusers: *täsmälleen*, *tarkalleen* "exactly, precisely"; *suunnilleen* "approximately"

It is important to note that some of the English translations given in Table 17.1 are only rough approximations, since DMs are language-specific and idiosyncratic. That is why the English elements are not presented as one-to-one translations of the Finnish DMs, but are intended as rough translations for the DM class in question. An important case in point are the Finnish DELIMITERS *ihan* and *aivan*, both of which can be translated as *quite*, but only approximately. They resemble *quite* in being multi-faceted and able to express both a moderate degree (in open-scale expressions) and a

maximal degree (in closed-scale expressions). For example, as a modifier of a closed-scale adjective in *ihan tyhjä* "quite empty," the DELIMITER *ihan* reinforces the closed-scale meaning ("totally empty"). Likewise, in the open-scale expression *ihan hyvä* "pretty good; good enough" it expresses a moderate degree. However, *ihan* also evokes a closed-scale meaning, in which a minimal-degree boundary is reached. A student's essay, for instance, may be *ihan hyvä* "good enough, sufficiently good" to be submitted (albeit not excellent). In some pairs of antonyms, the Finnish DELIMITERS behave asymmetrically (unlike the English *quite*). They express a maximal degree when they modify the negative pair, but are awkward as modifiers of the positive pair; for example, *ihan lyhyt* means "maximally short" (unlike the English *quite short*) and *ihan kevyt* "maximally light." Their antonyms ?*ihan pitkä* "quite long" and ?*ihan raskas* "quite heavy" are awkward (unlike their English translations with *quite*), unless the context imposes a maximal-degree boundary to the meaning of the adjective, as in *ihan pitkä hame* (quite long skirt), "a full-length skirt." The most likely reason is that the qualities designated by some negative adjectives have zero as their minimal-degree boundary, while their positive antonyms lack a corresponding maximal-degree boundary. Since there is no maximal-degree boundary, the DELIMITERS are not felicitous without a specific context evoking such a boundary. Unlike the English *quite*, the Finnish DELIMITERS *ihan* and *aivan* thus seem unable to function as genuine open-scale MODERATORS. When used with an open-scale adjective, they are either infelicitous or require a specific context, in which they coerce the adjective into a closed-scale meaning.

3. Finnish projective grams: an overview

Finnish adpositions are a semi-open class, comprising items that may be either less or more grammaticalized (for a historical account in English, see Grünthal, 2003). Most adpositions in Finnish are postpositions, but there are also prepositions, as well as some bipositions, which can be used in

either position. Most postpositions take a genitive complement (Ground): for example *pöydä-n pää-llä* (table-GEN[3] top-ADE) "on top of the table," while most prepositions take a complement in the partitive, e.g., *ennen ilta-a* (before evening-PAR) "before evening" (for details, see Grünthal, 2003: 62–74).

Projective grams conceptualize the Ground as asymmetrical: their use is based on notions such as "front" vs. "back," "left" vs. "right," and "above" vs. "below." They thus localize the Figure with respect to a system of axes (see e.g. Talmy, 2000; Levinson, 2003; Tenbrink, 2011). In what I will refer to as *origin-centric frames of reference*, the Ground serves as the origin of the coordinate system, i.e. the point where the three axes meet.[4] In contrast, a *field-based frame of reference* (Talmy, 2000: 213) uses the coordinate system to create an asymmetrical conceptualization of the inside of the Ground. Consider, for example, the inside of an auditorium, which has a "front" end (where the stage or podium is located) and a "back" end (opposite the podium), as well as "left" and "right" sides. A person sitting in the auditorium can then be localized by applying the coordinate system to the inside of the auditorium, as sitting for example "at the front" or "at the back" of the auditorium. Finnish projective grams behave differently with regard to degree modification according to whether the frame of reference used is origin-centric (in which the Figure is outside the Ground) or field-based (in which the Figure is inside the Ground).

Many Finnish adpositions, including projective ones, are derived historically from case-inflected nouns (e.g., *pää-llä* (head/top-ADE) "on top of" < "on the head/top of") or verbs (e.g. *lähti-en* (leave-INF) "since (temp.)" < "leaving"). This transparent background is also reflected in the fact

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[3] The following glosses are used: ABE = abessive ("without"), ABL = ablative, ACC = accusative, ADE = adessive, ALL = allative, COMP = comparative, ELA = elative, ESS = essive, GEN = genitive, GER = gerund, ILL = illative, INE = inessive, PAR = partitive, (number+)PL = (person+)plural, (number+)PLPX = (person+) plural possessive suffix, PRES = present tense, PRTC= participle, PST = past tense, REL = relative pronoun, (number+)SG = (person+) singular, (number+)SGPX = (person+) singular possessive suffix, SPL = superlative.

[4] Note that this use differs from that of Levinson (2003: 36), who calls the viewpoint person the *origin* of relative-FoR expressions such as *The ball is in front of the tree*. Since "the tree" is the point where the axes meet, I will call it the *origin* and reserve the term *viewpoint location* for the (often implicit) viewer's location.

that many of them contain local-case endings. Finnish has two productive series of local cases: the so-called interior cases, with the main spatial function of expressing a relationship of containment (the Figure is located inside the Ground), and the exterior cases, expressing vicinal relationships (the Figure is in the vicinity of or on top of the Ground). Both series include one LOCATION case (expressing a non-changing relationship in which the Figure occupies the search domain), one SOURCE case (meaning that the Figure leaves the search domain), and one GOAL case (meaning that the Figure enters the search domain). For the noun *talo* "house," for example, the interior case forms are the inessive *talo-ssa* "in the house" (LOCATION), elative *talo-sta* "out of the house" (SOURCE), and illative *talo-on* "into the house" (GOAL). The exterior case forms are the adessive *talo-lla* "at the house" (LOCATION), ablative *talo-lta* "from at (= out of the vicinity of) the house" (SOURCE) and allative *talo-lle* "to at (= into the vicinity of) the house" (GOAL).

These local-case endings often form part of adpositions, with a background as either full nouns or relational nouns. Quite often there is more than one case form in use, which means that the adposition in fact has a (partial) paradigm of local-case inflection. Such paradigms typically reflect the tripartite opposition between LOCATION, GOAL, and SOURCE. For example, the adessive-case adposition *pää-llä* (head-ADE) "on top of" expresses its search domain as a LOCATION where Figure is situated, the allative form *pää-lle* (head-ALL) "onto" as a GOAL into which the Figure enters, and the ablative form *pää-ltä* (head-ABL) "off" as a SOURCE from which the Figure exits. All forms are used as adpositions; the choice between them depends on the meaning expressed: the Figure's stationariness vs. motion into or out of the search domain.

Local-case inflection is also a ubiquitous feature of Finnish projective grams, which have distinct forms expressing LOCATION, SOURCE, and GOAL. Some of the gram stems are inflected in all the local cases of present-day Finnish (listed above), while others go back to historical case forms that are no longer productive in noun inflection; even these, however, typically distinguish between GOAL, LOCATION and SOURCE.

The stem *ete-* "front," for example, is fully inflected in all six local cases. The interior case forms are semantically general and able to express many kinds of "front" relations: inessive *ede-ssä* "in front of" (LOCATION), elative *ede-stä* "from in front of" (SOURCE), illative *ete-en* "to the front of" (GOAL). The exterior case forms of *ete-* "front," in contrast, specialize in the expression of two-mover scenarios in which Figure and Ground are moving in the same direction. These include the adessive form *ede-llä* "ahead of" (as in a race; LOCATION), ablative *ede-ltä* ("(away) from ahead of," SOURCE), allative *ede-lle* "to ahead of" (GOAL). The adessive form *edellä* expresses an unchanging two-mover scenario, in which Figure and Ground are moving in the same direction, Figure in front of Ground, as in "Lisa is ahead of Bill (in the race)." The ablative *edeltä* means that Figure exits the search domain "ahead of" the moving Ground (e.g., Lisa drops out of the race and exits her position "ahead of" Bill). The allative *edelle* means that Figure enters the search domain "ahead of" the moving Ground (e.g., Lisa passes Bill in the race). For motion events with Figure behind Ground, Finnish uses different grams altogether. For instance, there is a general "behind" gram *takana* "behind," which does not specifically express motion but can be used for all kinds of "behind" relationships, and the dedicated two-mover gram *jälje-ssä* (trace-INE) "behind, after (in a motion scenario)," which is historically an inessive case form of the noun *jälki* "trace." Both also have SOURCE and GOAL forms, which indicate a change in Figure's relationship with the search domain.

In Section 4, I discuss the scalar meanings of the general projective grams in different FoRs, while Section 5 is devoted to two-mover grams, which have idiosyncratic scalar meanings. For simplicity, I will limit the discussion to the LOCATION forms of each gram, ignoring their SOURCE and GOAL forms. The elements I classify as grams and discuss are used as both adpositions and adverbs, but I also discuss some elements that have only one of these functions.

4. Scalar meanings of the general projective grams

Finnish semantically general projective grams are able to express many kinds of projective relationships with a stationary or moving Ground. In the following, I discuss the LOCATION forms of these grams that express an unchanging Figure–Ground arrangement: *edessä* "in front of," *takana* "behind," *oikealla* "on the right," *vasemmalla* "on the left," *yllä* "above," and *alla* "below; under." Of these, *edessä* and *takana* can be used as adpositions with a genitive-marked Ground, or as adverbs without an overt Ground. When used as adpositions, they are postpositions, e.g. *puu-n edessä* (tree-GEN in.front.of) "in front of the tree," *talo-n takana* (house-GEN behind) "behind the house." The grams *oikealla* "on the right" and *vasemmalla* "on the left" are only used as adverbs, not as adpositions proper. Their Ground, however, can be expressed by an adverbial in a local "from" case, indicating a reference point (e.g., *minu-sta oikealla* (1SG-ELA on.the.right) "on my right," lit. "on the right from me"). The local case form is not grammatically a complement of the gram but an independent adverbial. To use an adpositional expression for the lateral (LEFT–RIGHT) axis, the relational noun *puole-lla* (side-ADE) "side" needs to be used with the gram, yielding compounds such as *Liisa-n oikea-lla puole-lla* (Liisa-GEN right-ADE side-ADE) "On Liisa's right side." The vertical-axis grams *yllä* "above" and *alla* "under, below" are postpositions with a genitive Ground (e.g. *pöydä-n yllä* (table-GEN above) "above the table). There are also two adverbs for the vertical axis: *ylhäällä* "up; overhead" and *alhaalla* "down; at the bottom," which are not used as adpositions.

I begin the following discussion (Section 4.1) by analyzing expressions using the field-based frame of reference to designate situations in which the Figure is located inside an encompassing Ground. In Section 4.2 I discuss expressions that activate origin-centric (intrinsic or relative) frames of reference with a point-like Ground, with the Figure located outside the Ground.

4.1. *The field-based frame of reference*

4.1.1. *General uses with encompassing Grounds*

In the field-based frame of reference, an encompassing reference object (or a secondary Ground) determines projective relations (Talmy, 2000: 213). The relationship between Figure and (primary) Ground is then understood in terms of an orienting principle that applies to both equally, and does not depend on (a viewer's) perspective. In other words, all entities are oriented in the same way. (See Moore, 2014: 65). For instance, when we say *John is ahead of Mary in the queue*, the queue is a secondary Ground, while the primary Ground is Mary, who is grammatically coded as a complement in the prepositional construction. The orientation of the queue is relevant to the assignment of FRONT and BACK to the primary Ground (Mary): a person closer to the front end of the queue (John) is *in front of* (or *ahead of*) a person farther away from the front end (Mary). Note that the example is felicitous regardless of the direction Mary is facing (Talmy, 2000: 204).

An encompassing Ground has an inside region, surrounded by actual or fictive boundaries. This region serves as the search domain within which the Figure is located. It can be a two-dimensional SURFACE (such as a football field) or a three-dimensional CONTAINER (such as an auditorium). To localize the Figure with projective grams, the inside of the Ground is conceptualized as asymmetrical, with a "front" end and a "back" end, as well as "left" and "right" sides. An auditorium, for instance, is a CONTAINER bounded (typically) by four walls, a floor and a ceiling. The walls function as its boundaries in the sagittal (FRONT–BACK) and lateral (LEFT–RIGHT) dimension, while the floor and ceiling serve as boundaries in the vertical (UP–DOWN) dimension. To code the location of the Figure inside the encompassing Ground, the projective grams need to be used as adverbs, not as adpositions proper (as demonstrated by Teeri-Niknammoghadam et al. 2020 for Finnish FRONT–BACK grams). The Ground can then be expressed by a distinct local adverbial, marked (for instance) with the inessive ("in") case. In such uses, the grams allow DMs of both closed scales (examples 1 and 2) and open scales (3 and 4).

1) Teatteri-ssa istu-i-n ihan edessä ~ takana ~ vasemmalla.

theatre-INE sit-PST-1SG right[5] in.front~in.the.rear~on.the.left

"In the theater I was sitting right in front ~ right in the back ~ on the far left."

2) Teatteri-ssa istu-i-n melkein edessä ~ takana ~ vasemmalla

theatre-INE sit-PST-1SG almost in.front~in.the.rear~on.the.left

”In the theater I was sitting almost in front ~ almost in the back ~ almost on the far left."

3) Teatteri-ssa istu-i-n melko edessä ~ takana ~ vasemmalla.

theatre-INE sit-PST-1SG rather in.front~in.the.rear~on.the.left

"In the theater I was sitting pretty in front ~ pretty in the rear ~ quite to the left."

4) Teatteri-ssa istu-i-n hyvin edessä ~ takana ~ vasemmalla.

theatre-INE sit-PST-1SG very in.front~in.the.rear~on.the.left

"In the theater I was sitting in the very front ~ in the very rear ~ to the very left."

The DELIMITER *ihan* in (1) and the APPROXIMATOR *melkein* in (2) relate the locative relationship to a closed scale. They evoke a search domain with two clear boundaries: a maximal-degree boundary, established by the limits of the auditorium, and a minimal-degree boundary, established by the conceptualizer somewhere between the maximal-degree boundary and the center of the auditorium. For example, the search domain of *vasemmalla* "on the left" in a closed-scale conceptualization is a bounded region adjacent to the left wall of the auditorium. The region comprises a few of the left-most seats (in any row of seats) and excludes others. Exactly how many seats are included in the search domain depends on the conceptualization. In example (1), *ihan* means that the Figure is definitely inside the search domain and maximally near the maximal-degree boundary specified by the

[5] The English DM *right* is often a more appropriate translation for *ihan* than *quite*. According to Talmy (2017: 317), *right* has the scalar meanings "directly (without detour)," "immediately (without delay)," "exactly (without wider compass)," "specifically (none other than)." At least the three first-mentioned meanings are also expressed by the Finnish *ihan*, when it modifies a projective gram.

gram. In other words, the Figure is located "immediately" next to the maximal-degree boundary (cf. Talmy, 2017: 317). In the context of a theater, for instance, *ihan edessä* "right in front" means that the Figure (a spectator) is sitting in the first row of seats. In (2), the APPROXIMATOR *melkein* means that the Figure is marginally outside the minimal-degree boundary of the search domain. Depending on the extent of the search domain, a Figure who is *melkein edessä* "almost in front" in a theater auditorium can be sitting somewhere behind the first (few) row(s) of seats but not in the very first one. Similarly, the lateral-axis expression with the DELIMITER, *ihan vasemmalla* "right at the left"; "on the far left" means that the Figure is sitting immediately next to the left (maximal-degree) boundary of the search domain, possibly in the leftmost seat of a row. The APPROXIMATOR in *melkein vasemmalla* "almost at the left" means that the Figure is marginally outside the search domain that comprises the leftmost seats of a row (exactly how many seats again depends on the conceptualization).

In examples (3) and (4), the open-scale DMs activate a conceptualization with a search domain that lacks such clear boundaries. Here the scalar conceptualization of the Figure's location approaches a maximal-degree boundary infinitely but never reaches it, as if the Figure were fictively moving nearer and nearer the boundary (cf. Talmy, 2017: 315–316). A minimal-degree boundary is likewise missing. The MODERATOR *melko* (3) and the BOOSTER *hyvin* (4) express different degrees on the open scale. If the Figure is a spectator sitting in an auditorium, the MODERATOR in *melko edessä* (3) means that the person is relatively close to the front of the auditorium. The BOOSTER in *hyvin edessä* (4) has a reinforcing function and means that the Figure's location reaches a high value on an open scale. In the context of an auditorium, this means that the Figure is sitting in one of the frontmost rows of seats. Figure 17.1 illustrates the scalar meanings of *edessä* "in front" and *takana* "behind" in the field-based FoR.

< Figure 17.1 >

Figure 17.1. EG = encompassing Ground (the auditorium), F(1–4) = Figures; Front = front end of EG, Back = back end of EG. The open-scale conceptualization is illustrated in the diagram on the left, with the gram *edessä* "in front." The closed-scale conceptualization is illustrated on the right, with the gram *takana* "behind." Figure 17.1 gives a bird's-eye view of the inside of an encompassing Ground.

The lefthand diagram in Figure 17.1 illustrates the open-scale conceptualization of *edessä* "in front." The location of F(igure)1 is "very front," and represents a high degree on an open scale. The location of F2 is "rather front," and represents a moderate degree. On the right is the closed-scale conceptualization, illustrated for the gram *takana* "behind." The search domain now has clear maximal- and minimal-degree boundaries, as well as an approximative zone, outside the actual search domain but adjacent to the minimal-degree boundary. The thick vertical line at the bottom of the scale represents the maximal-degree boundary (concretely, it can be the rear wall of the auditorium). The thin vertical line at some distance from it is the minimal-degree boundary. The dotted line is the outer boundary of the approximative zone. Figure F4 is clearly within the search domain, immediately next to the maximal-degree boundary; its location can be specified by the DELIMITER *ihan* "right" in example (1). F3 is marginally outside the search domain, in the approximative zone, and its location can be indicated by the APPROXIMATOR *melkein* in (2).

Vertical-dimension meanings based on the field-based FoR are expressed by the adverbs *ylhäällä* "up;[6] overhead" and *alhaalla* "down; at the bottom." These elements are not used as adpositions. Like the grams of the two horizontal axes (sagittal and lateral) discussed above, *ylhäällä* and *alhaalla* allow both open- and closed-scale DMs in a field-based FoR. For a closed-scale DM to

[6] Note that unlike the English *up* and *down*, which commonly express a direction ("upwards" or "downwards"), the two Finnish grams are LOCATION forms that express continuous presence of the Figure in the search domain (the directional meanings are expressed by the distinct GOAL forms *ylös* "up" and *alas* "down," which are not discussed here).

be felicitous the scale has to have a maximal value, and the search domain thus has to have a boundary. For *alhaalla* "down," the default boundary is the ground; *ylhäällä* "up" lacks a default boundary, and evokes the closed scale only if the Ground itself has an upper boundary, such as the ceiling of a room. Consider examples (5)–(7), which illustrate the uses of closed-scale DMs (the APPROXIMATOR *melkein* "almost" and the DELIMITER *ihan* "quite; right") with the two vertical-axis grams:

5) Hissi on melkein ylhäällä.
elevator be.PRES.3SG almost up
"The elevator is almost up (e.g., almost at the top floor)."

6) Lintu istu-u puu-ssa ihan ylhäällä.
bird sit-PRES.3SG tree-INE right up
"The bird is sitting right up in the tree (maximally high)."

7) Vesi on nyt ihan alhaalla.
water be.PRES.3SG now right down
"The water is all down now (maximally low)."

The APPROXIMATOR *melkein* "almost" in example (5) means that the elevator is in an approximative zone slightly outside the lower (minimal-degree) boundary of the search domain. The search domain comprises a bounded region at the upper end of the elevator shaft (at least the top floor and possibly some floors below it, depending on the conceptualization). In (5), the elevator may be for example at the second-highest floor on its route. It can be stationary or moving upwards, towards the top floor. In (6), the DELIMITER *ihan* "quite; right" means that the Figure is clearly within the search domain and that its location fulfills the relationship to a maximal degree. The tree is the

Ground, and the search domain comprises its topmost parts. A bird sitting on the treetop, for example, fulfills the relationship to a maximal degree. In (7), the DELIMITER *ihan* means that water (level) is maximally low, again on a bounded scale.

Especially in contexts in which the Ground lacks an upper boundary, it is more felicitous to use open-scale DMs to modify *ylhäällä* and *alhaalla* (see examples 8 and 9).

8) Lintu lentä-ä hyvin ylhäällä.
bird fly-PRES.3SG very high
"The bird is flying very high."

9) Vesi on nyt melko alhaalla.
water be.PRES.3SG now rather down
"The water is now rather low."

In (8), the BOOSTER *hyvin* "very" means that the bird has reached a high altitude on an open scale. The scale lacks a maximal value, and the boundaries of the search domain are vague. In (9), the MODERATOR *melko* "rather" means that the water level is relatively low but not extremely so. Figure 17.1 can be adapted to illustrate the field-based FoR on the vertical axis, if the dimension represented is thought of as vertical, and the elements Front and Back are replaced with Up and Down.

4.1.2. *Field of vision as an encompassing secondary Ground*

An idiosyncratic subtype of the field-based FoR is the one in which the primary Ground is a human being and the search domain consists of their field of vision, bounded by the left and right axes projected from the human Ground (consider Figure 17.2).

< Figure 17.2. >

Figure 17.2. Field of vision of a human Ground (G) entity (semicircle) and field-based scalar meanings of *oikealla* "on the right" and *vasemmalla* "on the left." For convenience, the open-scale conceptualization is illustrated by the scale inside the rim of the semi-circle, the closed-scale one by the scale outside the rim. F1–F5 are Figures. The arrow originating in G points in its intrinsic "forward" direction (the direction G is facing).

In Figure 17.2, the field of vision of the human Ground is represented as a semicircle bounded by the left and right segments of the lateral axis (assuming a simplistic conceptualization in which the human Ground cannot see areas behind the lateral axis). The rim of the circle represents the perimeter of the field of vision, i.e. how far the Ground can see. The left and right segments of the lateral axis set maximal scalar values to Figure's location, which is specified as a direction from the Ground (see Huumo, 2021 for an analysis of Finnish directional grams such as *kohti* "towards" or *ohi* "past"). In this conceptualization, Figure's distance from Ground is not relevant. Both open-scale and closed-scale DMs can modify the adverbs *vasemmalla* "on the left" and *oikealla* "to the right." These adverbs specify the direction of a vector that starts from the Ground and points towards the Figure. The two grams cannot be used as adpositions, and the Ground is thus implicit. Consider examples (10–14), which illustrate descriptions of the locations of F (1–5) in Figure 17.2, as indicated in their English translations.

10)	Kirkko	on	täsmälleen	vasemma-lla.
	church	be.PRES.3SG	exactly	left-ADE
	"The church (F1) is exactly on (your) left."			
11)	Hautausmaa	näkyy	ihan	oikea-lla.

cemetery be.visible.PRES.3SG right right-ADE

"The cemetery (F2) can be seen on the far right."

12) Vesitorni näkyy melkein oikea-lla.

watertower be.visible.PRES.3SG almost right-ADE

"The water tower (F3) can be seen almost on the far right."

13) Kaupungintalo on hyvin vasemma-lla.

city.hall be.PRES.3SG very left-ADE

"The city hall (F4) is very much to the left."

14) Muistomerkki on melko oikea-lla.

memorial be.PRES.3SG rather left-ADE

"The memorial (F5) is quite far to the right."

In uses where the degree expressed increases towards the lateral extremes of the sector (the field of vision), both open-scale and closed-scale DMs are felicitous. The increasing degree on the open scale is illustrated by the lines on the inside of the rim of the semi-circle in Figure 17.2. The length of the lines increases towards the lateral axis, illustrating the increasing degree. The degrees of the closed scale are displayed on the outside of the rim. In example (10), the FOCUSER *täsmälleen* "exactly" indicates a precise scalar value, which is fulfilled by F1's location precisely on the lateral axis. In (11), the DELIMITER *ihan* "quite; right" indicates a maximal value on a closed scale. In (12), the approximator *melkein* "almost" means that F3 is outside the actual search domain (or search sector), in an approximative sector marked with the dotted line. Examples (13) and (14) illustrate open-scale DMs: the BOOSTER *hyvin* "very" in (13) means that the location of F4 (more specifically, the direction of a vector pointing from G towards F4) reaches a high scalar value. The MODERATOR *melko* "rather" in (14) means that the scalar value is only relatively high.

Note that open-scale DMs are felicitous because the field-based FoR is in use: the human Ground's field of vision constitutes a secondary, encompassing Ground, which has the form of a semi-circle. The degree expressed increases towards its two extremes, in the same way that it increases towards the extremes of a square-shaped secondary Ground in the examples in Section 4.1.1. The closed-scale conceptualization, on the other hand, relates the Figure more directly to the left or right segment of the lateral axis as such; the encompassing secondary Ground as a whole is less relevant for them than it is for the open-scale DMs. Rather, the use of the closed-scale DMs is similar to its use in origin-centric FoRs, to be discussed next.

4.2. *Origin-centric frames of reference*

In origin-centric frames of reference the Ground is conceptualized as point-like, and serves as the origin of a three-dimensional coordinate system: it is the point where the three axes meet. The Figure is located outside the Ground and localized with respect to one of the axes (sagittal, lateral, or vertical). Origin-centric frames of reference comprise Levinson's (2003) intrinsic and relative. Only closed-scale DMs are felicitous in origin-centric uses of the Finnish projective grams. More specifically, the scalar meaning of the grams can relate to two factors: a) to a gradually decreasing distance between Figure and Ground (the *centripetal* meaning of Talmy, 2017: 315), and b) to a decreasing degree of deviation of Figure's location from an axis, i.e., whether Figure is located precisely on the axis or (slightly) removed from it (the *directional* meaning). In the centripetal meaning (a), the degree expressed increases the closer Figure is to Ground on the side of Ground specified by the gram. In the directional meaning (b), the degree is vector-based and inversely proportional to Figure's deviation from the axis. A maximal degree is attained by a Figure that is located precisely

on the axis. Meaning (a) is more compatible with the intrinsic FoR, while meaning (b) favors the relative FoR; this correlation, however, is not absolute. Consider examples (15–18):

15) Bussi on ihan kirko-n edessä.
Bus be.PRES.3SG right church-GEN in.front.of
"The bus is right in front of the church."
a. Located maximally near the front (= the façade) of the church.
b. Located precisely on the FRONT section of a sagittal axis projected from the church.

16) Kellotorni on melkein kirko-n takana.
clocktower be.PRES.3SG almost church-GEN behind.
"The clock tower is almost behind the church."
a. Located in an approximative zone, at some distance from the rear of the church, outside the search domain.
b. Located on an approximative sector near to but not precisely on the BACK section of a sagittal axis projected from the church.

17) Lamppu on ihan pöydä-n yllä.
lamp be.PRES.3SG right table-GEN above
"The lamp is right above the table."
a. Located maximally near (the upper surface of) the table.
b. Located precisely on a vertical axis projected upwards from the table.

18) Sukellusvene ol-i täsmälleen tankkeri-n alla.
submarine be-PST.3SG exactly tanker-GEN under

"The submarine was directly under the tanker."

In these examples, the closed-scale DMs specify the Figure's location with respect to an axis projected from the Ground. There are two alternative readings for the DELIMITER *ihan* "quite; right" in (15) and (17) and for the APPROXIMATOR *melkein* "almost" in (16). The first is what Talmy (2017) calls the centripetal one: the degree expressed increases the nearer Figure is to Ground. In addition, Figure has to be on the side of Ground specified by the projective gram. Since we are dealing with closed-scale DMs, the search domain has minimal- and maximal-degree boundaries: the maximal-degree boundary is the outer surface of the Ground entity itself, while the minimal-degree boundary (and its distance from the Ground) depends on the conceptualization. The maximal degree is represented by a Figure situated clearly inside the search domain and maximally near Ground. Its position can be expressed by the DELIMITER *ihan* "quite; right" (in 15 and 17). A Figure that remains marginally outside the search domain but in the vicinity of its outer border is in an approximative zone surrounding the actual search domain; its location can be specified by the APPROXIMATOR *melkein* "almost" in (16).

The alternative construal of the scalar meaning in (15)–(17), and the only one available to the FOCUSER *täsmälleen* "exactly" in (18), is the directional one. In this reading, the distance between Figure and Ground is irrelevant. The scalar meaning relates to the direction of a vector pointing from Ground towards Figure, and an assessment of its direction with respect to the axis specified by the gram. The degree expressed correlates inversely with the deviation of the vector from the axis. A Figure located precisely on the axis attains the maximal degree on a closed scale. This is the second, (b) reading of the DELIMITER *ihan* in (15) and (17), and of the APPROXIMATOR *melkein* in (16). It is the only reading for the FOCUSER *täsmälleen* "exactly" in (18). In this reading, the DELIMITER *ihan* "quite; right" and the FOCUSER *täsmälleen* "exactly" both mean that the Figure is located precisely on the relevant axis, and thus realizes the relationship to the maximal degree. The

APPROXIMATOR *melkein* "almost" in (16) means that Figure's location deviates from the axis sufficiently to be outside the actual search sector surrounding the axis, on an approximative sector surrounding the search sector. The two alternative scalar meanings (centripetal vs. directional) are illustrated in Figure 17.3.

< Figure 17.3. >

Figure 17.3. Scalar meanings of the projective grams in the origin-centric FoRs. The diagram on the left illustrates the directional meaning, the one on the right the centripetal meaning. G = Ground, F (1–5) = Figures, SD = search domain.

The left-hand diagram in Figure 17.3 illustrates the scalar-directional meaning of the projective grams. The arrow pointing away from G represents the relevant axis (sagittal, lateral, or vertical). The small arrows perpendicular to the axis illustrate the degree that increases toward the axis. The two solid lines surrounding the axis are boundaries of the search sector, while the dotted lines around them mark the approximative sector. A Figure located inside the search sector (at any distance from Ground) realizes the meaning of the projective gram. F1 is located precisely on the axis, and thus fulfills the scalar meaning to the maximal degree. Its location can be specified by the DELIMITER *ihan* "quite; right" (examples 15 and 17), or the FOCUSER *täsmälleen* "exactly" (example 18). F2 is a Figure located on the approximative sector, and its location can be specified by the APPROXIMATOR *melkein* "almost."

The centripetal meaning of the grams (meaning (a) in 15–17) is illustrated in the right-hand diagram in Figure 17.3. The grams now evoke a search domain (SD), which is adjacent to G and located on the side of G specified by the gram. The expressed degree is inversely proportional to the distance between Figure and Ground. F3 realizes the centripetal meaning to the maximal degree; its

location can be specified by the DELIMITER *ihan* "quite; right" in (15) and (17) (reading (a) in both). Figures F4 and F5 remain marginally outside the search domain, and are thus in the approximative zone. Their location can be specified by the APPROXIMATOR *melkein* in (18).

As mentioned at the beginning of this subsection, the centripetal reading is prominent if the intrinsic FoR is in use; in other words, the Ground is conceptualized as asymmetrical, with an intrinsic FRONT. The relative FoR evokes the point of view of an external viewer and foregrounds the direction-based scalar meaning of the grams. Specifically, the directional meaning is relevant if the visibility of Figure and Ground to the viewer is at issue. Consider examples (15) and (16) from this point of view: if, for example, the viewer attempts to take a photograph of Figure and Ground, a Figure "in front of" a Ground may block the Ground from view, while a Figure "behind" Ground may be out of sight, blocked by the Ground. This is one example of a relative-FoR context in which the scalar-directional meaning of the grams is more prominent than the centripetal one.

5. Scalar meanings of the motion grams

Finnish motion grams specialize in the expression of what I will refer to as two-mover scenarios (Huumo, 2015; 2019; see also Moore, 2011; 2014). In these scenarios Figure and Ground are moving in the same direction: for example cars in a motorcade or runners in a race. According to Moore (2011; 2014), two-mover scenarios trigger a field-based frame of reference: both Figure and Ground are moving in the same direction, and their mutual position does not change. Thus FRONT and BACK are assigned in the same way to both entities, by a property of the environment.

Most Finnish two-mover grams express meanings primarily related to the sagittal (FRONT–BACK) axis. For example, *edellä* "ahead of; in front of" means that Figure is more advanced in the direction of motion than Ground. However, the Figure of *edellä* may not be actually aligned on a sagittal axis projected from Ground; consider a race in which each runner is running in their own

lane of the race track, and the runner in the leftmost lane is slightly more advanced than (and thus "ahead of") the one in the rightmost lane (example 19; for a detailed account, see Huumo, 2019; for metaphorical uses, Teeri-Niknammoghadam, 2019). The antonym of *edellä* is *jäljessä* "behind; after" and means that the Figure is less advanced than the Ground in their common direction of motion (example 20).

19) Suomalainen on ruotsalais-ta edellä.
Finn be-PRES.3SG Swede-PAR ahead.of
"The Finn is ahead of the Swede (e.g., in a race)."

20) Suomalainen on ruotsalais-ta jäljessä.
Finn be-PRES.3SG Swede-PAR behind
"The Finn is behind the Swede (in a race)."

In grammatical terms, *edellä* "ahead of" and *jäljessä* "behind" allow their complement (the expression that designates the Ground) to be in either the partitive case, as in (19) and (20), or the genitive case (*ruotsalaise-n edellä ~ jäljessä* "ahead ~ behind the Swede"). Huumo (2015; 2019) has argued that when the Ground is in the partitive, *edellä* and *jäljessä* designate an unstable scenario in which the order of Figure and Ground is subject to change (as in a race). In contrast, the construction with a genitive Ground typically designates a stable and unchanging scenario, such as the order of cars in a train (21). A partitive Ground would be awkward in (21), since it would imply that the cars might change their relative position:

21) Ravintolavaunu on hiljaise-n vaunu-n edellä.
restaurant.car be.PRES.3SG silent-GEN car-GEN ahead.of
"The restaurant car is ahead of the silent car."

In addition to these sagittal-axis grams, there is one lateral-axis gram that relates to (two-mover) motion. This is *viere-llä* (side-ADE) "on the side of; next to (e.g. in a motion scenario)," as in "The dog was walking by Liisa's side." In this function, *vierellä* contrasts with the semantically general *viere-ssä* (side-INE) "on/by the side of; next to," which most typically expresses situations of stationariness (e.g., "The tree is next to the house"). Like *ede-llä* (front-ADE) "ahead of," the gram *vierellä* "next to" is an adessive case form, while its semantically general counterpart, *vieressä* "next to," is an inessive case form (just like *ede-ssä* (front-INE) "in front of"). Both *vierellä* and *vieressä* indicate Figure's location on the lateral axis, at the side of the Ground, without specifying a "right" vs. "left" opposition. Unlike *edellä*, which is a dedicated two-mover gram, *vierellä* has several uses besides motion (Huumo and Peiponen, 2013). In expressions of a two-mover scenario, however, *vierellä* functions as a two-mover gram for the lateral axis and belongs together with the sagittal-axis two-mover grams *edellä* "ahead of," and *jäljessä* "behind." The three can even be thought of as forming a three-member paradigm of two-mover grams: *edellä* means that Figure is more advanced than Ground, *vierellä* that the two are equally advanced (and located next to each other), and *jäljessä* that Figure is less advanced than Ground.

This system is also relevant to the uses of degree modifiers with the grams. In general, the DMs that modify two-mover grams measure the advancement of the moving Figure in relation to the moving Ground. The lateral axis, which moves together with the Ground, is therefore an important element in the meanings of all three grams. When Figure and Ground are not coaxially aligned (i.e., when Figure is not located on the sagittal axis projected from Ground), Figure's advancement can be measured as its distance from the moving lateral axis. The lateral axis then divides the environment into two incessantly changing regions: the FRONT region (located IN-FRONT of the moving lateral axis) and the BEHIND region (located BEHIND the moving lateral axis). Closed-scale degree modifiers can be used to indicate the position of the moving Figure with respect to the

moving Ground (and the moving lateral axis). The sagittal axis, however, also plays a role in the meaning of the grams *edellä* "ahead of" and *jäljessä* "behind," as we shall see shortly.

For the grams *edellä* "ahead of (two-mover)" and *jäljessä* "behind (two-mover)," the scalar meaning evoked by a DM typically relates to Figure's distance from the moving lateral axis. This distance has both a centripetal and a centrifugal conceptualization. In the centripetal conceptualization, the degree is inversely proportional to the distance between the moving Figure and the moving lateral axis: the closer the Figure is to the axis, the higher the degree expressed. In the centrifugal conceptualization, the degree is directly proportional to the distance between the two: the further away Figure is from the moving lateral axis, the higher the degree.

In the centripetal conceptualization, a Figure maximally near the moving lateral axis fulfills the relationship to a maximal degree. Its position can be specified by the near-synonymous DELIMITERS *ihan* and *aivan* "quite; right; immediately." In the centrifugal conceptualization, the degree increases the further away Figure is from the moving lateral axis. The genitive-Ground construction (see 22 and 24) favors the centripetal reading, while the partitive-Ground construction (23 and 25) favors the centrifugal one:

22) Suomalainen on ihan ruotsalaise-n ede-llä.
Finn be.PRES.3SG right Swede-GEN front-ADE
"The Finn is just (immediately; barely) ahead of the Swede."

23) Suomalainen on ihan ede-llä ruotsalais-ta
Finn be.PRES.3SG right front-ADE Swede-PAR
"The Finn is way ahead of the Swede."

24) Suomalainen on aivan ruotsalaise-n jälje-ssä
Finn be.PRES.3SG right Swede-GEN trace-INE
"The Finn is just (immediately; barely) behind the Swede."

25)	Suomalainen	on	aivan	jälje-ssä	ruotsalais-ta
	Finn	be.PRES.3SG	right	trace-INE	Swede-PAR

"The Finn is way behind the Swede."

In (22) and (24), the genitive construction evokes the centripetal meaning with a degree inversely proportional to the distance between Figure and Ground (or between Figure and the moving lateral axis projected from the Ground). It may also evoke the coaxial meaning in which Figure and Ground are aligned in single file, such that Figure is right in front of or right behind Ground (on a sagittal axis projected from the Ground). In (23) and (25), with the partitive Ground, the sagittal axis is not relevant, and the meaning is of the centrifugal kind: the degree is directly proportional to the distance that separates Figure from the moving lateral axis.

To confirm my own intuitions regarding these subtle differences, I conducted an inquiry with ten students majoring in Finnish language and linguistics who were native Finnish speakers, taking a course in cognitive semantics. The students were given ten identical, schematic bird's-eye-view diagrams with one runner (the Ground, shown as a circle) on a six-lane race track, and were asked to mark the location of another runner (the Figure), as indicated in test sentences such as (22)–(25). While the informants were not in full agreement, in each case a clear majority (at least seven out of ten) confirmed my intuition: when presented with the example in the genitive, they drew the other runner (a circle representing the Figure) in a position immediately in front of or behind the runner shown in the picture (the Ground), with the two running in single file and with a minimal distance between them. When asked to illustrate the partitive construction, they drew the Figure at a considerable distance from the Ground or the lateral axis (in the direction specified by the gram: "way ahead" or "way behind"), and most of them did not locate the Figure coaxially with the Ground. Two informants, however, found the partitive construction not fully acceptable in Standard Finnish, but characterized it as "colloquial."

The centripetal meaning, illustrated by examples (22) and (24), seems to be restricted to uses of DELIMITERS. APPROXIMATORS, as usual, require Figure to be located marginally outside the search domain. Since the search domain of two-mover grams is the whole FRONT or BACK region, the approximative zone has to be on the opposite side of the lateral axis from that region. This means that a Figure which is "almost ahead of" a moving Ground is in fact "behind" the Ground (or the lateral axis) and has the potential to enter the search domain only by passing the Ground. This is the meaning evoked by APPROXIMATORS, irrespective of whether the Ground is marked by the genitive or the partitive. Examples (26) and (27), with *edellä* "ahead of" thus in practice indicate the same situation (though with slightly different conceptualizations); likewise for *jäljessä* "behind; after" in (28) and (29). It should be noted, however, that (28) has an alternative reading, in which the Figure is so far behind the Ground that it is outside the search domain; in that case, "behind" refers to a more compact bounded search domain located immediately behind the moving Ground, not to the whole BACK region.

26)	Suomalainen	on	melkein	ruotsalaise-n	ede-llä
	Finn	be.PRES.3Sg	almost	Swede-GEN	front-ADE
	"The Finn is almost ahead of the Swede."				
27)	Suomalainen	on	melkein	ede-llä	ruotsalais-ta
	Finn	be.PRES.3SG	almost	front-ADE	Swede-PAR
	"The Finn is almost ahead of the Swede."				
28)	Suomalainen	on	melkein	ruotsalaise-n	jälje-ssä.
	Finn	be.PRES.3SG	almost	Swede-GEN	trace-INE
	"The Finn is almost behind the Swede."				
29)	Suomalainen	on	melkein	jälje-ssä	ruotsalais-ta
	Finn	be.PRES.3SG	almost	trace-INE	Swede-PAR

"The Finn is almost behind the Swede."

Thus, (26) and (27) mean that Figure (the Finn) is not (yet) "ahead of" Ground (the Swede) but in an approximative zone outside (= behind) the FRONT region, and that the Figure has the potential to enter the FRONT region by passing the Ground. Examples (28) and (29) indicate the opposite situation: one in which the Figure (the Finn) is in fact slightly "ahead of' the Ground (the Swede) and the moving lateral axis, but has the potential to enter the search domain, which is now the BACK region behind the moving lateral axis. This potential may arise for example if the runner conceptualized as Figure gets tired and starts moving more slowly than the one conceptualized as Ground, and is thus about to be passed by the latter. Consider Figure 17.4

< Figure 17.4. >

Figure 17.4. Scalar meanings of the two-mover grams *edellä* "ahead of" and *jäljessä* "behind." F1–F5 are Figures and G is Ground. All participants are moving in the direction specified by the white arrows (= toward the left in the diagram), and the situation is seen from above. The lateral axis projected from the Ground is likewise moving. Grey arrows indicate a potential change in the position of the Figure from the approximative zone into the search domain proper. FRONT and BACK are regions separated from each other by the moving lateral axis. They serve as search domains for the grams *edellä* "ahead of" and *jäljessä* "behind," respectively. The dotted lines indicate approximative zones for the individual Figures.

In Figure 17.4, F1 is "almost ahead of" G because it is moving in the same direction as G but more rapidly, and thus has the potential to pass the moving lateral axis. The grey arrow indicates this potential. F2 is marginally "ahead of" G but moving more slowly than G, and thus has the potential to

be passed by G and to enter the search domain of "behind"; this potential is again marked by the grey arrow. In other words, F2 is *melkein jäljessä* "almost behind" G in the race. F3 illustrates the centripetal meaning of *jäljessä* "behind": F3 is "just behind" G by being maximally near G. F4 and F5 illustrate the centrifugal conceptualization (with respect to the moving lateral axis). F4 is *ihan edellä* "way ahead" of G (by a significant margin) and F5 *ihan jäljessä* "way behind" G.

Potential ambiguity thus arises with the delimiters *ihan* and *aivan* ("quite; right") in the motion scenarios, but the ambiguity is resolved by the adpositional construction used and the case marking of the Ground. In the Genitive + postposition construction, the centripetal reading of the grams *edellä* and *jäljessä* is dominant (as was also confirmed by my informants). The DELIMITERS specify the reaching of a maximal degree on a closed scale: Figure is maximally near Ground, possibly also "right in front of" it or "right behind" it. In the partitive-Ground construction, in contrast, the centrifugal reading dominates, and the DELIMITERS mean that the distance between the moving Figure and the moving lateral axis is maximally large on a closed scale (*way ahead of* and *way behind* are not quite accurate English translations, because they indicate an open scale). This centrifugal meaning of the two-mover grams is also the dominant one if the grams are used as adverbs, without an overt Ground.

Now consider the gram *viere-llä* (side-ADE) "next to," which has several functions (Huumo and Peiponen, 2013); in motion expressions, however, it designates a two-mover arrangement in which a moving Figure is situated next to a moving Ground. Unlike the two-mover grams *edellä* "ahead of" and *jäljessä* "behind," which have the whole FRONT and BACK regions as their search domains, *vierellä* indicates a scalar meaning that reaches its maximal degree when Figure is located precisely on the moving lateral axis (i.e., directly to the right or left of G). The scale is of the closed type, and the scalar assessment proceeds in the FORWARD direction of the movers. This is most clearly manifest in the meaning of the APPROXIMATOR *melkein* "almost" in (30): it indicates that the Figure is in an approximative zone, located behind (not in front of) the moving lateral axis. It would

be awkward to use (30) to describe a situation in which the Finn is actually slightly "ahead of" the Swede in the race.

30)	Suomalainen	on	melkein	ruotsalaise-n	viere-llä
	Finn	be.PRES.3Sg	almost	Swede-GEN	side-ADE
	"The Finn is almost next to the Swede (= almost neck and neck)."				

The DELIMITER *ihan* "quite; right" in (31) indicates a maximal scalar value on a closed scale, i.e., that the Finn is precisely on the lateral axis, next to the Swede.

31)	Suomalainen	on	ihan	ruotsalaise-n	viere-llä.
	Finn	be.PRES.3Sg	right	Swede-GEN	side-ADE
	"The Finn is right next to the Swede (= neck and neck)."				

In addition, *vierellä* also has a centripetal reading which resembles the centripetal readings of *edellä* "ahead of" and *jäljessä* "behind" in the genitive-Ground construction. A grammatical difference distinguishing *vierellä* from the other two constructions is that *vierellä* occurs only in the Genitive-ground construction, and rejects a Ground in the partitive; such expressions are ungrammatical. In the centripetal reading, the relevant point is how near Figure is to Ground. The scale relates to this distance, not to Figure's advancement in the direction of motion. With the centripetal reading, example (30) with its APPROXIMATOR means that the Figure is outside the search domain located next to the moving Ground, while (31) with the DELIMITER means that the Figure is clearly within the boundaries of the search domain. The scalar meanings of *vierellä* "next to" are illustrated in Figure 17.5.

< Figure 17.5. >

Figure 17.5. The scalar meanings of *vierellä* “next to”. F1–F4 are Figures moving in the same direction as G (the Ground). The white arrows indicate the direction of their motion. Grey arrow indicates a potential change in the relationship, black arrows the increasing degree on the relevant scale.

In Figure 17.5, F1 and F2 illustrate the motion-related scalar meaning of *vierellä* "next to," while F3 and F4 illustrate the centripetal meaning. For F1 and F2, the scale is parallel to the FORWARD direction of motion, and the degree increases toward the moving lateral axis (from behind it). F1 is in the approximative zone near the axis and has the potential to reach the axis, since it is moving faster than G. F2 is precisely on the axis and fulfills the scalar meaning to the maximal degree. F3 and F4 illustrate the centripetal meaning. F3 is clearly inside the search domain and maximally near G. It thus realizes the scalar meaning to a maximal degree. F4 is outside the search domain in an approximative zone; its location can be specified by the APPROXIMATOR *melkein* "almost."

6. Conclusions

The above analysis of grams and degree modifiers highlights important and previously unreported differences between different gram groups, but also in the meanings of individual grams belonging to the same semantic group. At the same time, the division between centrifugal and centripetal grams proposed by Talmy (2017) has been specified and supplemented by the findings above. A scalar meaning of a gram is not always based on the distance between Figure and Ground; it can also be based on the deviation of Figure’s location from an axis. In motion scenarios expressed by the dedicated motion grams *edellä* "ahead of," *jäljessä* "behind," and *vieressä* "next to," the scalar

meaning is based on the advancement of Figure in the direction of motion as assessed in relation to Ground, when the two are moving in the same direction.

Degree modifiers with an open scale can modify projective grams mainly when Ground is of the encompassing kind and the FoR is field-based. In that case the grams are used as adverbs, not as adpositions. The degree increases towards one extreme of Ground's inside. The openness of the scale blurs the boundaries of the search domain, and the conceptualization is such that Figure approaches (moves fictively towards; cf. Talmy, 2017: 315) the boundary without ever reaching it. Closed-scale DMs are also used in the field-based FoR. They then set a well-defined search domain adjacent to one extreme of the inside of Ground, and indicate whether Figure is located within the search domain or outside it in an approximative zone.

In their adpositional use, the projective grams activate an origin-centric (relative or intrinsic) FoR and relate Figure's location to an axis projected from Ground. Their scalar meaning is then based on a closed scale, and can in most cases be specified by APPROXIMATORS and DELIMITERS. Such combinations typically have two readings: they either localize Figure with respect to an axis in a directional conceptualization or indicate Figure's distance from Ground in a centripetal conceptualization. In the directional conceptualization, the expressed degree correlates inversely with the deviation of Figure's location from the axis. A Figure located exactly on the axis fulfills the relationship to the maximal degree. In the centripetal reading, the degree correlates inversely with Figure's distance from Ground.

In motion scenarios with Figure and Ground moving in the same direction, the scalar meaning of the grams relates to Figure's advancement in the direction of motion: whether it is more, less, or equally advanced as Ground. The lateral axis is moving together with Ground, and it provides a reference point that marks Ground's advancement even for Figures that are not coaxially aligned with Ground (directly in front of or behind it). For the grams *edellä* "ahead of," and *jäljessä* "behind," which specialize in the expression of two-mover scenarios, there are two scalar readings: a

centripetal one (which resembles that observed in origin-centric FoRs), and the centrifugal, motion-related one. The centripetal meaning is prominent in the genitive-Ground construction, and favors the coaxial alignment of Figure and Ground. The centrifugal conceptualization is expressed by the partitive-Ground construction; here the degree expressed is directly proportional to the distance separating the moving Figure from the moving Ground or the moving lateral axis. The third motion gram, *vierellä* "next to," also has two scalar meanings: the centripetal one, with a degree inversely proportional to the distance separating Figure and Ground (moving side by side), and the motion-related one that measures Figure's advancement with respect to Ground in such a way that a Figure aligned precisely on the lateral axis fulfills the relationship to the maximal degree.

Degree modifiers highlight significant facets of the meanings of grams that might otherwise remain undetected. A combined investigation of grams and degree modifiers also reveals similarities between grams and adjectives. In a broader sense, the consideration of degree modifiers links the semantic aspect of grams to phenomena such as quantification, as emphasized by Paradis (2001). Examining the different functions of degree modifiers that modify grams provides a wealth of interesting new topics for future research.

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Table 1. Classification of Finnish DMs (from Huumo 2021).

	Open-scale DMs	Closed-scale DMs
Attenuating	Diminishers: *hiukan*, *vähän* 'somewhat; (a) little'	Approximators: *melkein* 'almost'
	Moderators: *melko*, *aika*, *kohtalaisen* 'rather; somewhat; relatively' Delimiters: *ihan*, *aivan* 'quite'	
Reinforcing	Boosters: *hyvin*, *erittäin* 'very, extremely'	Maximizers: *täysin*, *täydellisen* 'completely, perfectly, totally' Delimiters: *ihan*, *aivan* 'quite'
Others		Focusers: *täsmälleen*, *tarkalleen* 'exactly, precisely'; *suunnilleen* 'approximately'

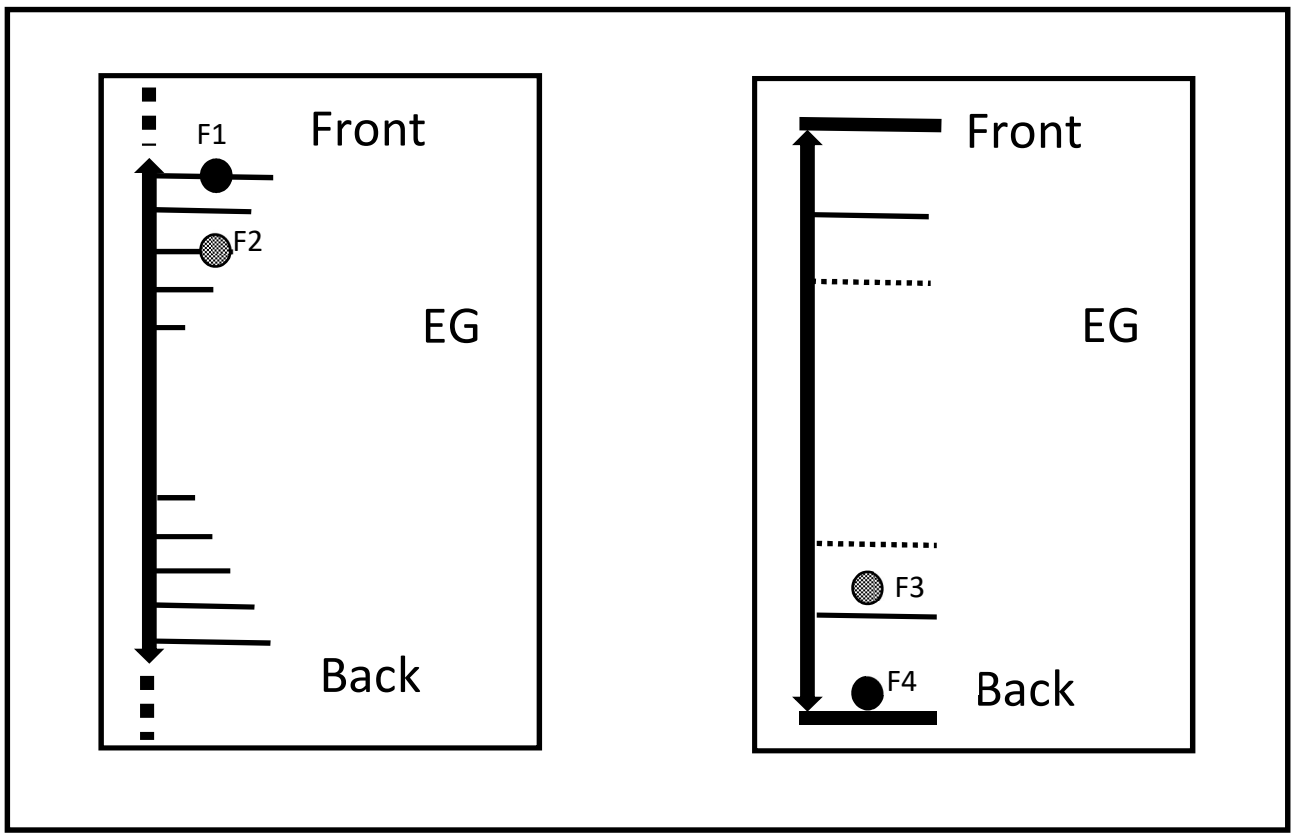

Figure 1. EG = encompassing Ground (the auditorium), F(1–4) = Figures; Front = front end of EG, Back = back end of EG. The open-scale conceptualization is illustrated in the diagram on the left, with the gram *edessä* 'in front'. The closed-scale conceptualization is illustrated on the right, with the gram *takana* 'behind'. Figure 1 gives a bird's-eye view of the inside of an encompassing Ground.

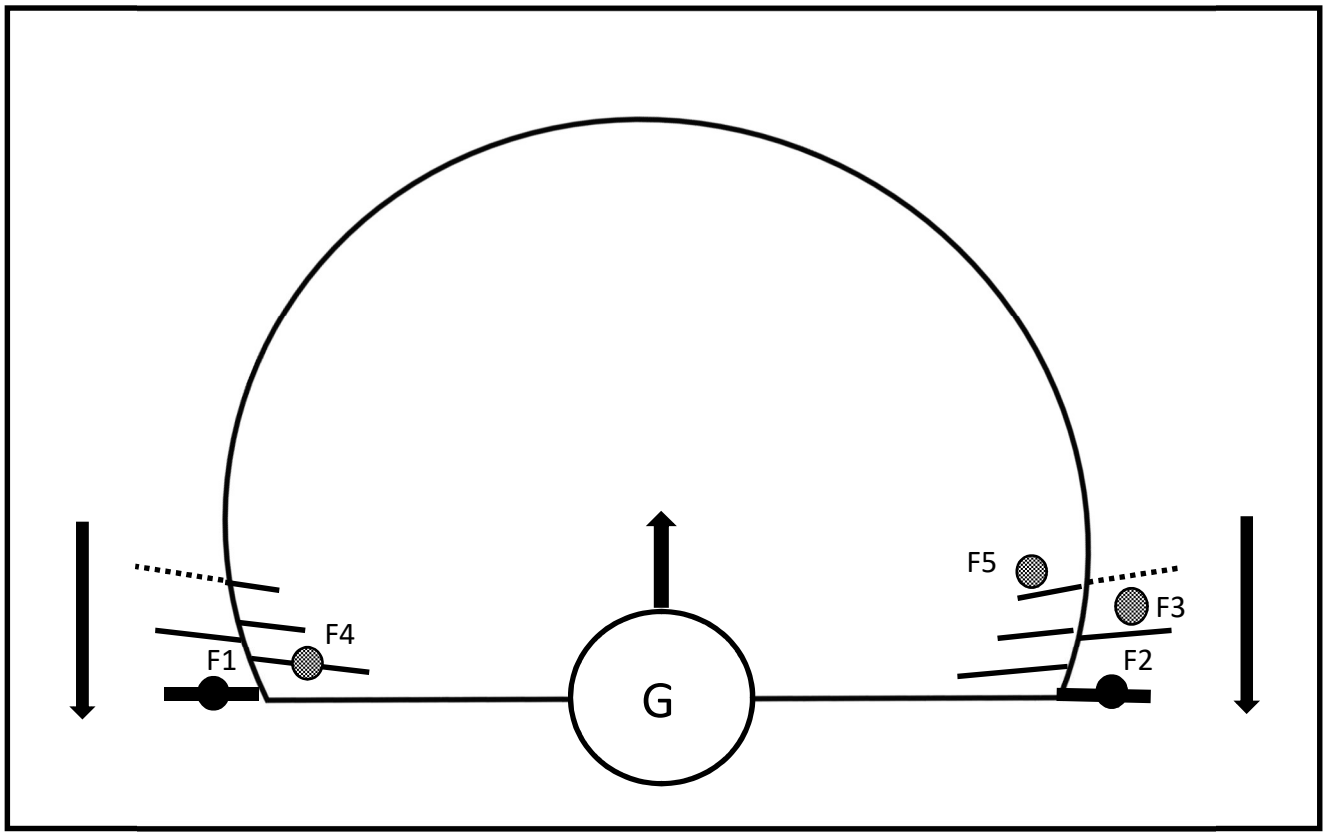

Figure 2. Field of vision of a human Ground (G) entity (semicircle) and field-based scalar meanings of *oikealla* 'on the right' and *vasemmalla* 'on the left'. For convenience, the open-scale conceptualization is illustrated by the scale inside the rim of the semi-circle, the closed-scale one by the scale outside the rim. F1–F5 are Figures. The arrow originating in G points in its intrinsic 'forward' direction (the direction G is facing).

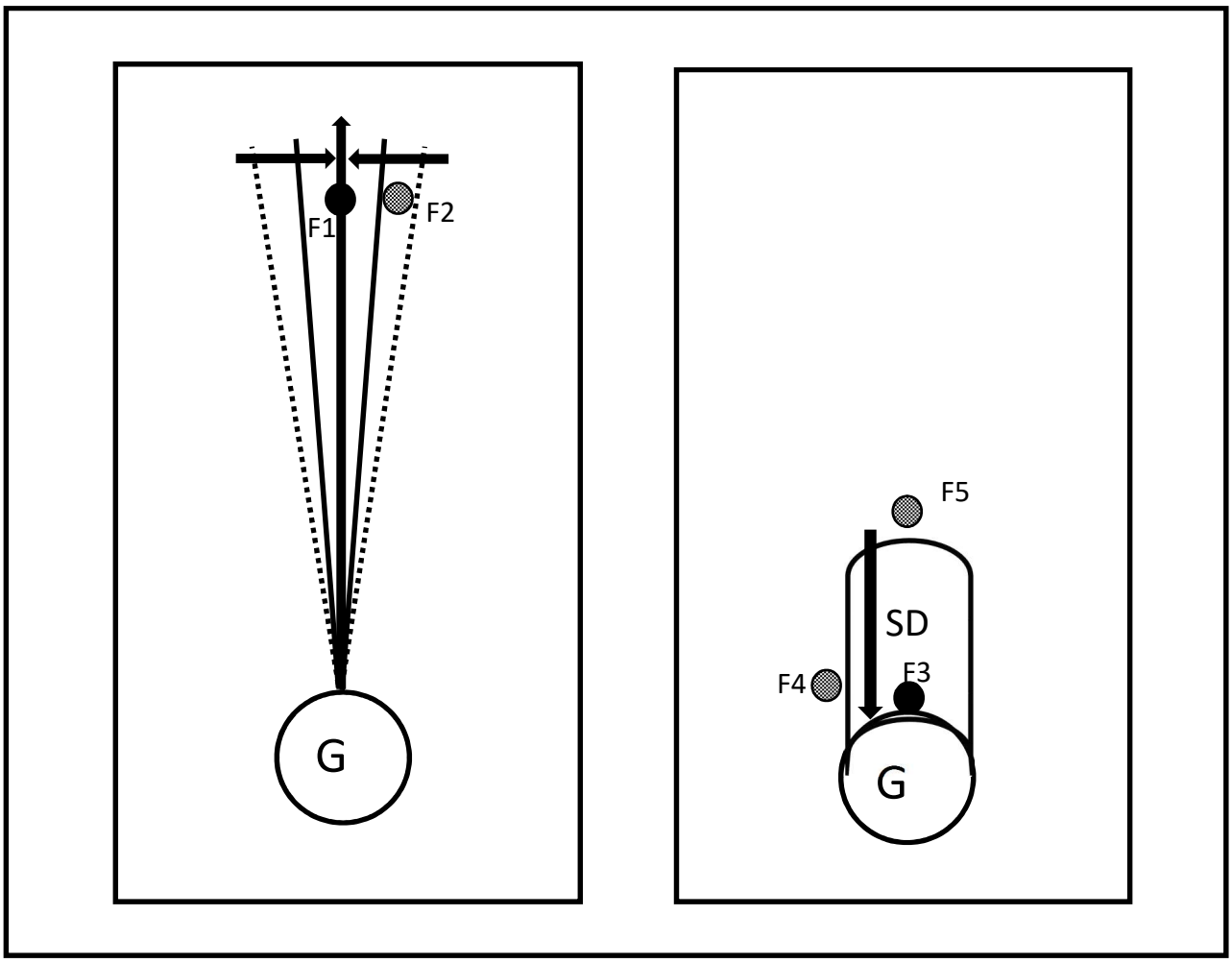

Figure 3. Scalar meanings of the projective grams in the origin-centric FoRs. The diagram on the left illustrates the directional meaning, the one on the right the centripetal meaning. G = Ground, F (1–5) = Figures, SD = search domain.

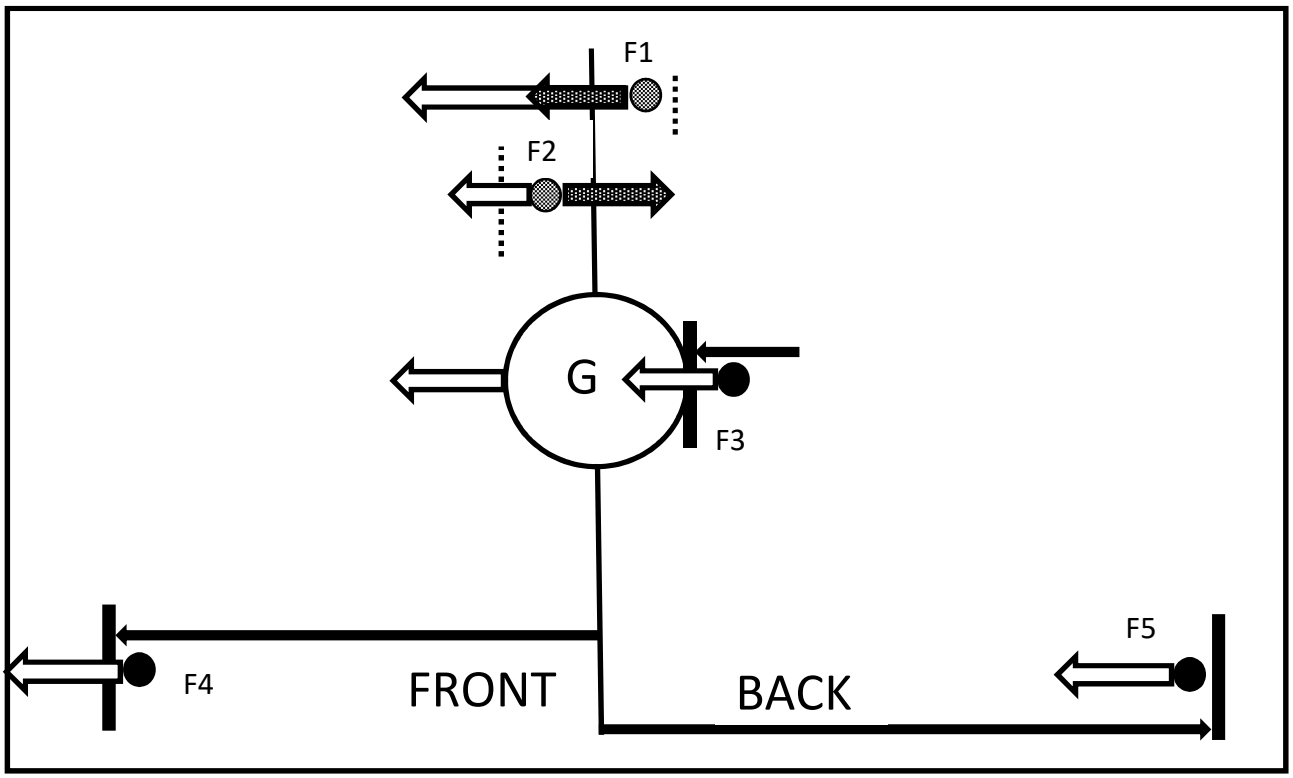

Figure 4. Scalar meanings of the two-mover grams *edellä* ’ahead of’ and *jäljessä* ’behind’. F1–F5 are Figures and G is Ground. All participants are moving in the direction specified by the white arrows (= toward the left in the diagram), and the situation is seen from above. The lateral axis projected from the Ground is likewise moving. Grey arrows indicate a potential change in the position of the Figure from the approximative zone into the search domain proper. FRONT and BACK are regions separated from each other by the moving lateral axis. They serve as search domains for the grams *edellä* ‘ahead of’ and *jäljessä* ‘behind’, respectively. The dotted lines indicate approximative zones for the individual Figures.

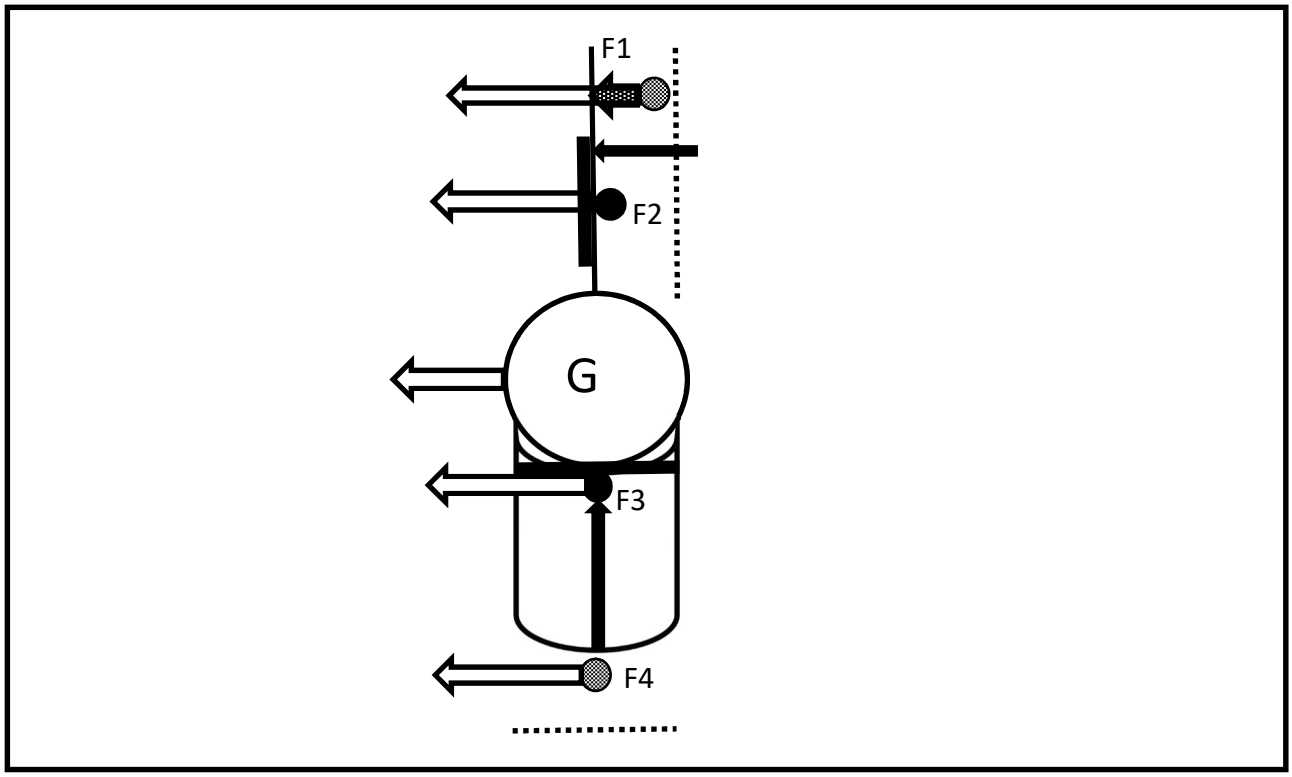

Figure 5. The scalar meanings of *vierellä* 'next to'. F1–F4 are Figures moving in the same direction as G (the Ground). The white arrows indicate the direction of their motion. Grey arrow indicates a potential change in the relationship, black arrows the increasing degree on the relevant scale.