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## Flexibility and Rigidity: Multiplicatives, Frequency and Quantification Adverbs<sup>1</sup>

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### 0. Introduction

There are a variety of adverbs which modify the description of repeatedly occurring situations. They can specify the number of occurrences or the frequency of such situations. The exact distinction among these adverbs – if it is acknowledged – is sometimes left vague, with the differences not explicitly specified (e.g. Cinque 1999, Ernst 2002).<sup>2</sup> In this paper I argue for a distinction among three classes of adverbs of counting: multiplicatives, frequency adverbs and adverbs of quantification. Building mostly on data from Hungarian, a highly discourse-configurational language, I note differences which follow from a simple, intuitive characterization of these adverbs. I also address the distribution of these adverbs, which is shown to follow from the view proposed here, and some additional properties of the adverbs.

A few terminological remarks are in order. In the following discussion, I use the term *situation* or *event*; loosely, these refer to some kind of eventuality, or subevents of complex eventualities (e.g. the event that is iterated). The term *situation description* or *event description* refers to the description of the appropriate event; properties such as countability can be defined for descriptions rather than for the situations themselves. As for the property of countability itself, I simply treat it as non-homogeneity.<sup>3</sup>

The paper is organized as follows. Section 1 presents the three classes of adverbs and discusses the properties distinguishing these. Section 2 considers the distribution of the adverbs. Sections 3 and 4 argue that it is possible to iterate ad-

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<sup>2</sup> Other distinctions among the adverbs, including the property vague/ absolute or relative/ fixed (cf. Stump 1985), are ignored here.

<sup>3</sup> I assume that homogeneity should be defined as divisibility, but the discussion is also compatible with homogeneity defined as cumulativity.

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verbs of each type, and that not all adverbs can introduce a plurality of events. Section 5 notes some crosslinguistic extensions and concludes the paper.

### 1. Adverbs of Counting

Within **adverbs of counting**, there is a tripartite distinction among **multiplicatives**, frequency adverbs (**freq-adverbs**) and adverbs of quantification (**Q-adverbs**). This section offers a characterization and arguments supporting the distinction.

#### 1.1. Multiplicatives

Multiplicative adverbs specify the number of occurrences of situations of the same type. In Hungarian, a language which displays surface scope in the preverbal domain (cf. Szabolcsi 1997, É. Kiss 2002, a.o.), multiplicatives take scope over the quantificational elements they precede.

- (1) a. **Kétszer** [mindenki megkóstolta a pudingot]  
 twice everyone-NOM tasted the pudding-ACC  
 'Everyone tasted the pudding twice' (it happened twice that everyone tasted the pudding)
- b. Mindenki **kétszer** [megkóstolta a pudingot]  
 everyone-NOM twice tasted the pudding-ACC  
 'Everyone tasted the pudding twice' (for every person, they tasted the pudding twice)

As shown below in section 2, multiplicatives have a flexible distribution. This follows from the unique restriction on the distribution, which requires multiplicatives to modify countable situation descriptions.

#### 1.2. Freq-Adverbs and Q-Adverbs

The distinction between freq-adverbs and Q-adverbs is often left vague. Following partially van Geenhoven (2004, 2005) and Johansdottir (2005), I assume a strict division between the two types of adverbs.

Intuitively, freq-adverbs specify the frequency of multiple situations of the same type within a larger time interval (cf. Stump 1981, 1985). Q-adverbs, in contrast, quantify over situations (cf. de Swart 1993, 1996, a.o.).

It follows that freq-adverbs, but not Q-adverbs, require a time interval argument. This leads to a contrast in descriptions which hold outside of time (Lewis 1975, Johansdottir 2005). Consider (2). The possible values of a variable are independent of the time when the values are determined; no temporal argument for the situation is available. Accordingly, freq-adverbs (which require a time argument) are marked and Q-adverbs, with no such requirement, are fully acceptable.<sup>4</sup>

<sup>4</sup> The adverbs are separated by slashes (/). The grammaticality marking conveys that no matter which adverb is chosen, the example has the same grammaticality status.

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- (2) a. ??Az egyenletben ennek a változónak **sűrűn** / **ritkán**  
 the equation-in this-DAT the variable-DAT frequently rarely  
 / **rendszeresen** negatív az értéke  
 regularly negative the value-POSS  
 'The value of this variable in the equation is frequently / rarely / regularly negative' (**freq-adverb**)
- b. Az egyenletben ennek a változónak **gyakran** /  
 the equation-in this-DAT the variable-DAT often  
**néha** / **általában** / **rendszeresen** negatív az értéke  
 seldom generally usually negative the value-POSS  
 'The value of this variable in the equation is often / seldom / generally / usually negative' (**Q-adverb**)

Unique situations also distinguish the two types of adverbs. With a unique situation, such as Feri eating a sandwich or a child being born, freq-adverb (but not Q-adverb) modification is marked:

- (3) a. ??Feri **sűrűn** evett egy szendvicset  
 F-NOM frequently ate a sandwich-ACC  
 'Feri frequently ate a sandwich' (**freq-adverb**)
- b. Feri **gyakran** evett egy szendvicset  
 F-NOM often ate a sandwich-ACC  
 'Feri often ate a sandwich' (**Q-adverb**)
- (4) a. ??A kórházban **sűrűn** született egy csecsemő  
 the hospital-in frequently was born a baby-NOM  
 'A baby was frequently born in the hospital' (**freq-adverb**)
- b. A kórházban **gyakran** született egy csecsemő  
 the hospital-in often was born a baby-NOM  
 'A baby was often born in the hospital' (**Q-adverb**)

The contrast is in line with the characterization given, with the additional stipulation that freq-adverbs must take scope over the default existential quantifier which binds the variable. Freq-adverbs specify the frequency of situations within a certain time interval; that non-uniqueness requirement follows from the impossibility of determining frequency for a single occurrence of a situation. Q-adverbs, in contrast, are quantificational; they specify that the event of Feri eating a sandwich or that of a child being born in the hospital occurred often. Because it is the (atomic) situation that is being quantified over, the uniqueness of a situation does not lead to ungrammaticality and the quantifier can bind a non-temporal variable.

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The uniqueness requirement also predicts the following contrast. Recall that in preverbal positions, Hungarian has surface scope. The plural expression thus falls outside of the scope of the freq-adverb in (5a), and the freq-adverb modifies a unique situation, that of electing a specialist as chairperson. This is ruled out, given the non-uniqueness requirement imposed by freq-adverbs. The uniqueness condition is not relevant for Q-adverbs, and they are acceptable in this environment (5b).

- (5) a. ??A frissen alapított vállalatoknál **sûrûn** / **rendszeresen**  
 the recently founded companies-at frequently regularly  
 egy szakembert választanak elnöknek  
 a specialist-ACC elect-3PL chairperson-DAT  
 'At recently established companies, it is frequently / regularly a specialist that is elected as chairperson' (**freq-adverb**)
- b. A frissen alapított vállalatoknál **gyakran** / **rendszerint**  
 the recently founded companies-at often usually  
 egy szakembert választanak elnöknek  
 a specialist-ACC elect-3PL chairperson-DAT  
 'At recently established companies, it is often / usually a specialist that is elected as chairperson' (**Q-adverb**)

Unique situations also distinguish multiplicatives and Q-adverbs, where both adverbs are quantificational. Multiplicatives (whether absolute or vague) specify the cardinality of a situation, and similarly to freq-adverbs, they cannot modify unique situations (6a). Q-adverbs, as noted above, can modify such situations (6b).

- (6) a. ??Feri **sokszor** meg-evett egy szendvicset  
 F-NOM many times PARTICLE ate a sandwich-ACC  
 'Feri ate a sandwich many times'
- b. Feri **gyakran** meg-evett egy szendvicset  
 F-NOM often PARTICLE ate a sandwich-ACC  
 'Feri often ate a sandwich'

It is the requirement of a time interval argument and non-uniqueness of situations that distinguish freq-adverbs and Q-adverbs. Other diagnostics, suggested by van Geenhoven (2004, 2005), Johansdottir (2005), Cinque (1999) and others, fail to identify these two categories of adverbs. The problematic criteria include the following: functional uniqueness, homogeneity and time intervals affected.

(a) Functional uniqueness, which maintains that at most one adverb of each type may be present in a clause, cannot be maintained. The number of occurrences of these adverbs is not intrinsically restricted; constraints follow from parsing limitations and coercion effects (cf. section 3). (b) The two adverbs are assumed to have different effects on aspectual values. Freq-adverbs are said to affect ho-

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mogeneity, yielding unbounded, atelic aspect for the complex description. Q-adverbs are assumed not to change aspectual values in this way (cf. van Geenhoven 2004, 2005). Rather, both freq-adverbs and Q-adverbs can yield homogeneous, unbounded situation descriptions; the two adverb types are not different in this respect.<sup>5</sup> (c) Finally, the time intervals affected are also assumed to distinguish the two adverb classes. Specifically, van Geenhoven (2005) suggests that freq-adverbs operate on the event time, while Q-adverbs operate on the reference time interval. This distinction is dictated by functional uniqueness, which ultimately cannot be upheld, as noted above. The time intervals affected cannot be characterized in terms of iterativity and habituality either; both Q-adverbs and freq-adverbs allow habitual interpretation, which would require these adverbs to operate on some habitual time interval.

### 1.3. Morphological Differences

In addition to the criteria of non-uniqueness and modification of statements outside of time, morphology and non-temporal interpretation also provide a useful heuristic for distinguishing freq-adverbs and Q-adverbs.

In Hungarian, the realization of freq-adverbs can have non-temporal interpretation. Fixed freq-adverbs, for example, have a distributive suffix (*-ként* or *-ente/-onta*) which allows non-temporal use as well.

- (7) a. *órán-ként* 'hourly' (time)    *mérfölden-ként* 'by mile' (spatial measure)  
 b. *het-ente* 'weekly' (time)    *darab-onta* 'by piece'

Relative freq-adverbs in Hungarian appear with a general adverbial suffix *-n*, which derives adverbs from adjectives. These freq-adverbs have a non-temporal, usually a spatial homonym (8b).

- (8) a. *Feri sűrűn / ritkán sütött pizzát*  
 F-NOM frequently rarely baked pizza-ACC  
 'Feri baked pizza frequently / rarely' (time)  
 b. *Feri sűrűn / ritkán ültette a virágokat*  
 F-NOM frequently rarely planted the flowers-ACC  
 'Feri planted the flowers densely / thinly' (space)

Q-adverbs fail to display such homonyms; no adverb or morphological component has a spatial parallel.<sup>6</sup> The non-temporal interpretation then identifies freq-

<sup>5</sup> The characterization in van Geenhoven (2004, 2005) appeals to the property of atelicity that arises after freq-adverb modification. In absence of a specific definition and view of atelicity, freq-adverbs and Q-adverbs can be treated on par. Both types of adverbs can yield homogeneous, unbounded situation descriptions, whether homogeneity is defined as cumulativity or divisibility.

<sup>6</sup> The lack of spatial use can be illustrated by the following example:

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adverbs unambiguously. In fact, spatial use is expected for these adverbs; the same adverb or suffix can specify frequency in either temporal or spatial domains.

## 2. Adverb Distribution

The distribution of multiplicatives can only be characterized in terms of the interpretation described above. Crucially, their distribution differs from that of other adjuncts and arguments in Hungarian, where the latter is determined by quantificational and referential properties of the expression.

### 2.1. Different Distribution Patterns

In general, topicalized, referential expressions appear at the left edge of the clause, followed by (distributive) quantifiers. The rightmost zone contains focused elements, negation and other, possibly non-referential expressions (cf. É. Kiss 2002).

(9)	Topics	<i>Quantifiers / Q-adverbs</i>	<b>Focus / negation / freq-adverb</b> [V XP*]
	a pudingot the pudding-ACC	<i>mindenki</i> everyone-NOM	<b>villával ette</b> fork-with ate
	'Everyone ate the pudding with a fork'		
	a csokoládét the chocolate-ACC	<i>sokan</i> many people-NOM	<b>nem szerették</b> not liked
	'Many people didn't like chocolate'		
	Feri F-NOM	<i>gyakran</i> often	<b>villával ette a pudingot</b> fork-with ate the pudding-ACC
	'Feri often ate pudding with a fork'		
	A villát the fork-ACC	<i>mindenki</i> everyone-NOM	<b>sűrűn használta</b> frequently used
	'Everyone used the fork frequently'		

Some adverbs of counting fail to pattern with other constituents in this respect. Let us consider those instances where the same quantificational component (such as the numeral *three*) can be identified in both adverbs of counting (the multiplicative *three times*) and other expressions (e.g. *three cakes*). The distribution of

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(i) Feri *néha / gyakran* ültetett virágokat  
F-NOM seldom often planted flowers-ACC  
'Feri seldom / often planted flowers' / \*'Feri planted flowers thinly / densely'

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multiplicatives and other constituents, even if they contain the same quantificational element, is distinct.

Multiplicatives can all appear in the three zones described above. They differ, among others, from other, indefinite expressions, which are restricted to topic and focus/ postverbal positions. Only multiplicatives, but not other indefinites can appear in the zone of quantifiers, freely ordered among quantifiers. Q-adverbs, in contrast, show parallelism with related quantificational expressions; all are located in the quantifier zone. No prediction is made for freq-adverbs; even though there exist spatial parallels with these adverbs, the distribution is not determined by the referential or quantificational properties noted above.

The distribution of adverbs of counting is illustrated in more detail below, and the distribution is motivated in the following subsection.

## 2.2. Adverbs of Counting

As the table in (9) indicates, the distribution of Q-adverbs and freq-adverbs is distinct. Only the former can precede quantificational expressions:<sup>7</sup>

- (10) a. Feri **gyakran** / **néha** / **rendszerint** **mindenkit**<sub>Q</sub> meghívott  
 F-NOM often seldom usually everyone-ACC invited  
 'Feri often / seldom / usually invited everyone' (**Q-adverb**)
- b. ??Feri **sűrűn** / **rendszeresen** **mindenkit**<sub>Q</sub> meghívott  
 F-NOM frequently regularly everyone-ACC invited  
 'Feri frequently / regularly invited everyone' (**freq-adverb**)

Freq-adverbs, unlike Q-adverbs, can follow negation:

- (11) a. ?Feri **nem**<sub>NEG</sub> **gyakran** / **néha** / **rendszerint** késett el  
 F-NOM not often seldom usually was late PART  
 'Feri was not often / seldom / usually late' (**Q-adverb**)
- b. Feri **nem**<sub>NEG</sub> **sűrűn** / **rendszeresen** késett el  
 F-NOM not frequently regularly was late PART  
 'Feri was not frequently / regularly late' (**freq-adverb**)

As noted above, multiplicatives are more flexible; they are freely ordered with freq-adverbs (12a) and quantificational elements, including Q-adverbs (12b).

- (12) a. Feri (kétszer<sub>M</sub>) **sűrűn**<sub>F</sub> (kétszer<sub>M</sub>) cseppet  
 F-nom twice frequently twice rang  
 'Feri rang (twice) frequently (twice)'

<sup>7</sup> The subscript Q, F or M indicates the category of the adverb of counting. The subscripts Q and NEG, on constituents other than adverbs of counting, indicate position according to table (9).

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- b. Feri (ʔkétszer<sub>M</sub>) **gyakran**<sub>Q</sub> (kétszer<sub>M</sub>) telefonált  
 F-nom twice often twice called  
 'Feri often called twice' / 'Twice, Feri called often' (e.g. on two trips)

### 2.3. Adverb Positions Derived

The distribution of adverbs of counting follows from the characterization offered above. **Q-adverbs** behave like quantifiers, as the former quantify over situation descriptions. The distribution of these two types of constituents is thus predicted to be parallel. **Multiplicatives** count the number of occurrences of (countable) situations. It is expected that multiplicatives can modify any appropriate description – an expectation that is borne out, as shown by the flexible ordering of these adverbs.

Finally, **freq-adverbs** specify the frequency of occurrence of (types of) situations within a certain time interval. Let us assume that freq-adverbs take a time interval argument, for which frequency is established. It follows then that freq-adverbs can only appear in a domain where time interval arguments can appear.

This domain is the zone which contains focus, negation, the verb and postverbal elements in Hungarian, boldfaced in the preceding examples. Here I offer only one argument for restricting time intervals to this zone, but additional supporting evidence is also available. Let us assume that time intervals are merged with (a projection) of the constituent that requires a time interval argument. Let us also assume that the **tense**, the ordering of speech time and reference time is structurally higher than all other time intervals, and that speech time is local to tense.

Speech time must then be lower than focus, given the following asymmetry. In neutral sentences, particles precede the verb. In a finite clause with focus, the particle will follow the verb (13a). In nonfinite clauses, however, the particle can appear on either side of the verb (13b). The contrast between finite and nonfinite focus constructions is naturally ascribed to the difference in the **tense** head, which is located below the focus position (cf. Brody 1990). Freq-adverbs are then restricted to a position below focus, to the domain where time intervals are available.

- (13) a. Feri AZ ORVOSTÓL késett el / \*el késett  
 F-NOM the doctor-from was late PART PART was late  
 'Feri was late FOR THE DOCTOR'S APPOINTMENT'
- b. Fontos [Ferinek AZ ORVOSTÓL késnie el / el késnie]  
 important F-DAT the doctor-from be late PART PART be late  
 'It is important for Feri to be late FOR THE DOCTOR'S APPOINTMENT'

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### 3. Multiple Adverbs of the Same Type

It is worth emphasizing that there is no inherent restriction on iterating adverbs of counting. Contrary to van Geenhoven (2005), Johansdottir (2005), and others, functional uniqueness does not hold for these adverbs. Furthermore, the occurrence is also not restricted to two adverbs of each type (contra Cinque 1999).

Limitations on multiple adverbs do arise; but they are rather due to the necessity of coercion. All adverbs of counting modify descriptions that are countable, but modification by a freq- or a Q-adverb yields a complex non-countable description. It follows then that a (non-countable) situation description which contains a freq-adverb cannot be modified by another freq-adverb or a Q-adverb, since the latter require a countable description. The mismatch can be resolved, however, by coercion, which forces a countable interpretation for the non-countable description (cf. Moens and Steedman 1988, de Swart 1998, a.o.). The non-countable description in this case has a delimited interpretation; this can arise, for instance, by considering periods of being late frequently (which can occur rarely; cf. (14b)).

- (14) a. Feri      **négyszer<sub>M</sub>**      **háromszor<sub>M</sub>**      **kétszer<sub>M</sub>**      csengetett  
          F-NOM      four times      three times      twice      rang  
          'Feri rang twice three times, on four occasions'
- b. Feri      **ritkán<sub>F</sub>** késett    el      **(rendszeresen<sub>F</sub>)**      **sűrűn<sub>F</sub>**  
          F-NOM      rarely    was late PART      regularly      frequently  
          'It rarely happened that Feri was (regularly) frequently late'
- c. Feri      **néha<sub>Q</sub>**      **(általában<sub>Q</sub>)**      **gyakran<sub>Q</sub>**      csengetett  
          F-NOM      seldom    usually      often      rang  
          'Feri seldom rang (usually) often'

The markedness of multiple adverbs of the same type arises from the necessity of coercion operations and parsing limitations. The interpretation of the iterated adverbs is, however, entirely predictable; whenever multiple adverbs are present, they exhibit surface scope. This is expected, given that Hungarian has surface scope.

### 4. Freq-Adverbs and Multiple Situations

It follows from the proposed view of adverbs that freq-adverbs (and multiplicatives) do not yield multiple events on their own. That is, the existence of multiple situations of the same type must arise independently. Crucially, freq-adverbs cannot be seen as pluractional operators which yield plurality of events.

This conclusion is in line with the non-uniqueness requirement noted above, and is also supported by the following Hungarian data. The verbs in (15a) appear with a semelfactive affix, and the example describes a unique event. Accordingly, freq-adverbs cannot modify the description. In (15b), the verbs bear an iterative affix; the example describes multiple, iterated situations. These examples allow freq-adverbs, since the adverb modifies a description of multiple situations.

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- (15) a. ??Feri **sûrûn** kopp-int-ott / köh-int-ett  
 F-NOM frequently knocked-SEMELFACTIVE-PAST coughed-SEM-PAST  
 'Feri frequently knocked / coughed'
- b. Feri **sûrûn** kop-og-ott / köh-ög-ött  
 F-NOM frequently knocked-ITERATIVE-PAST coughed-ITERATIVE-PAST  
 'Feri frequently knocked / coughed'

Q-adverbs, in contrast with freq-adverbs, express quantification over situations. They can modify either unique situation descriptions (as with verbs bearing a semelfactive affix) or complex situations containing multiple events:

- (16) Feri **gyakran** kopp-int-ott / kop-og-ott  
 F-NOM often knocked-SEM.-PAST knocked-ITERATIVE-PAST  
 'Fred often knocked (once or repeatedly)'

The non-uniqueness requirement imposed by freq-adverbs can also be illustrated without appealing to verbal morphology, as the discussion in section 2 shows. A unique situation – such as electing someone as the chairperson at a newly established company – cannot be modified by a freq-adverb. (17) is correctly predicted to be marked: the freq-adverb, which follows and scopes below the plural expression, modifies a unique situation description (the plural expression appears in boldface below).

- (17) ?? A frissen alapított **vállalatoknál sûrûn** egy szakembert  
 the recently established companies-at frequently a specialist-ACC  
 választanak elnöknek  
 elect-3PL chairperson-DAT  
 'At recently established companies, frequently a specialist is elected  
 as chairperson'

It follows from the adherence to surface scope that whenever the freq-adverb precedes – and so takes scope over – the plural expression, modification of the same description becomes fully grammatical. Once again, this is expected, since it is a repeated rather than a unique situation that the adverb modifies in this case.

- (18) **Sûrûn** választanak egy szakembert elnöknek  
 frequently elect-3PL a specialist chairperson-DAT  
 a frissen alapított **vállalatoknál**  
 the recently founded companies-DAT  
 'Frequently, a specialist is elected as chairperson at recently established  
 companies'

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### 5. Adverbs of Counting

Building on data from Hungarian, I argued for a strict distinction among adverbs of counting. Intuitively, multiplicatives specify the number of occurrences of situations; frequency adverbs specify frequency and adverbs of quantification quantify over situations. The adverb classes are distinguished by a number of properties, including morphological forms and the availability of spatial homonyms of the adverbs. The distribution of the adverbs also varies according to adverb types, and is consistent with the classification and description proposed.

The data discussed above are restricted to Hungarian, but the conclusions partially carry over to other languages as well. Consider, for instance, *many times*, *frequently* and *often* – examples of a multiplicative, a freq-adverb and a Q-adverb, respectively. Similarly to Hungarian, only Q-adverbs can modify statements that hold outside of time (also Johansdottir 2005):

(19) The variables in this equation are ?frequently / often negative

Only Q-adverbs can modify unique situations; multiplicatives and freq-adverbs are marked in this context:

(20) Fred (often) ate a sandwich (??many times) / (??frequently)

Morphological form also provides an argument in line with Hungarian. Freq-adverbs, including *frequently* and *rarely*, bear a general adverbial suffix, *-ly*. The stem, *frequent* and *rare*, can have a non-temporal interpretation. Q-adverbs, like *often* and *seldom*, have neither an identifiable adverbial suffix nor non-temporal use.

The position of the adverbs does not follow straightforwardly from their characterization, but this observation can be related to the lack of pervasive discourse-configurationality in English. A detailed overview of adverb distribution, as well as a more general description and account of these adverb classes crosslinguistically, is left for further research.

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