

Statistical Literacy Textbook: Chapter 5 Slides

Statistical Literacy: Critical Thinking about Everyday Statistics **Kendall-Hunt 2023**

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Rate, Chance & Ratio Grammar

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Rate, Chance and Ratio Grammars

Chapter 5: Learning Outcomes

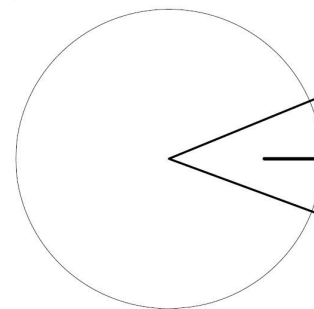
- ‘Rate’ keyword is equivocal: frequency, growth, prevalence & incidence.
- Rate grammar has two forms: phrase and clause.
- Chance family: odds, risk, likelihood & probability.
- Describe chance grammar in phrase and clause forms.
- Chance grammar often omits the whole.
- Describe ratios using ratio grammar.
- Recognize inverse in rate, chance and ratio grammars.
- Ratios are easily influenced by choice of denominator.

Ratios: A Confounder Solution

CONFOUNDER SOLUTIONS

Inside the Data	Mental: Simple
Effect Size	Selection
Controlled Study	Ratios
Study Design	Standardization
----- Hypothetical thinking -----	

1995 Hispanic Male Texans



Whole is the pie

Accidental Death

Part is the slice

RATIOS (Using Prepositions)

Common Prepositions :

*Of, in, for. To [4 to 3; 4-3; 4:3]
4 out of [every] 5; cut in half*

Per Grammar:

*miles per gallon ; mph
deaths per 1,000 men*

Named-Ratios

Named-Ratios

Ratio Grammar:

*ratio of women to men
student-teacher ratio*

Percent Grammar:

85% of military personnel are men

Percentage Grammar: fraction/share

percentage of men who bet

Chance Grammar: odds/risk/probability

*chance of [our] winning;
chance that we will win
chance to win ; chance for a win*

Rate Grammar: prevalence, incidence

rate of n per d

Men died at a rate of n per d

Light-edge boxes need clause for part and whole (cannot compare ratios).

Dark-edge boxes have part and whole in phrases (can compare ratios)

Ch 5: Grammars for Rate, Chance and Ratios

Each of these three grammars have subtle aspects.

1. **Rate grammar** has four kinds of rates. The part-whole rates allow ‘of’ to introduce the part (rate of death) or the whole (death rate of men).
2. **Chance grammar** may omit the whole (chance of winning) or is ambiguous in identifying the whole (chance that the next flip of a coin will be heads).
3. **Ratio grammar** is terse. Teacher-student ratio or student-teacher ratio. Ratio of men to women or ratio of women to men. The slash (/) means ‘per’.

Ch 5: Part and Whole for Rate, Chance and Ratios

Part and whole make sense for percentages where the numerator is never bigger than the denominator.

Part and whole don't make sense for ratios where numerators can be bigger than denominators. (20 students per teacher).

Part and whole don't make sense for chance grammar where the part is the uncertain outcome.

Nevertheless, part and whole are used for these three grammars.

#1: Rate Grammar

Four kinds of rates (all rates use ‘per’):

frequency, prevalence, incidence and growth.

- Frequency: Rate of speed was 60 miles per hour
- Prevalence: Unemployment rate: 5% of workers.
- Incidence: Immigration rate: 0.3% per year in US.
- Growth: population grew at a rate of 10% per year.

Prevalence and *incidence* have a numerator and denominator (called part and whole in this book).

Incidence combines frequency (per unit time) and prevalence (per number in the population).

#1: Accidental Death Rate: Frequency (Count)

Among US males in 1990, the accidental *death rate** was three times as big among whites as non-whites.

Deaths from Accidents and Violence			
1990	RACE		
SEX	White	Non-White	ALL
Male	82,940	27,120	110,060
Female	34,210	8,070	42,280
ALL	117,150	35,190	152,340

Including suicide and homicide

* Death rate is a frequency: deaths per year (a count).

#1: Accidental Death Rate: Incidence

Among US males in 1990, the accidental *death rate** was almost twice as big among non-whites as whites.

US 1990 Population by race and gender			
(1,000)	RACE		
SEX	White	Non-White	ALL
Male	102,143	19,096	121,239
Female	106,561	20,910	127,471
ALL	208,704	40,006	248,710

1998 U.S. Statistical Abstract, Table 22

Accidental death rate (per 100,000 population)

1990	RACE		
SEX	White	Non-White	ALL
Male	81	142	91
Female	32	39	33
ALL	56	88	61

1998 U.S. Statistical Abstract, Table 147

* Death rate is incidence: deaths /100,000 population/year.

#1: Rate Grammar: Phrase-Based vs clause-Based

Phrase based uses phrases for the part and whole:

Phrases: Adjective-noun or prepositional.

The [accidental death] rate [of men] is ...

Clause-based uses the entire clause:

Clause: includes subject and verb.

Men died at a higher rate this year.

Phrase form is more abstract: better for titles

Clause form is more concrete but longer.

#1: Rate Grammar: Phrase-Based

Phrase form is more common than clause form.

Grammar template for phrase-based rate descriptions

R1: The _____ rate of _____ is _____ per _____.
part whole # #

R2: Among _____, the rate of _____ is _____ per _____.
whole part # #

#1: Rate Grammar

General Rules for Per and Rate Grammar

1. Any countable following the keyword *per* is always a whole.
2. Named rate grammar include *rate*, *incidence*, and *prevalence*.

Incidence is a ratio involving a time interval (death rate, birth rate).

Prevalence is a ratio taken at a moment in time (unemployment rate).

3. In phrase rates, *rate of* introduces either a part or whole.

The word preceding *rate* is a part if it is countable*.

Rate of introduces a whole if the word before a rate is countable*.

Rate of introduces the part if the word before rate is *not* countable*.

*Uncountable: appositive (the), quantity (8%), evaluation (low) or possessive (men's).

#1: Auto Traffic Death Rates

Compare data for 1970 with 1960: deaths vs per miles.
Compare data for 2020 with 2019.

US Auto Deaths and Rates	1960	1970	1980	1990	2000	2010	2019	2020*
Deaths	38,137	54,633	53,172	46,814	43,354	32,855	33,244	35,766
Per 100,000 resident population			22.5	17.9	14.9	10.6	11.0	11.8
Per 100,000 licensed drivers			35.2	26.7	22.0	15.7	15.8	17.0
Per 100,000 registered vehicles	51.2	49.2	34.8	24.2	19.2	12.6	12.1	13.0
Per 100 million vehicle miles	5.31	4.88	3.30	2.08	1.53	1.11	1.11	1.34

US Statistical Abstract: 2009 Table 1092

Traffic Safety Facts: crashstats.nhtsa.dot.gov 811630, 813141, 813375

<https://injuryfacts.nsc.org/motor-vehicle/historical-fatality-trends/deaths-and-rates/>

*Covid March 2020

#1: Rate Grammar: Clause-Based

Grammar template for clause-rate descriptions

Clause rate grammar can have either the whole or part as the subject. [1]

Main clause rate grammar: "at a rate"

R3: Subject (whole) verb (part) at a rate of N per M.

Men die accidentally at a rate of 91 per 100,000 per year.

R4: Subject (part) verb (intransitive)

Accidental death occurs [among/to/for men] at a rate of N per M [whole]

Subordinate-clause rate grammar: "rate at which". [2]

R5 The rate at which subject (whole) verb (part) is N per M.

The rate at which males died accidentally is 91 per 100,000 per yr.

R6 The rate at which subject (part) verb (intransitive) is N per M whole.

The rate at which accidental deaths occur among/to/for males is ...

[1] Other forms are possible. E.g., "The U.S. rate is 61 deaths per 100,000 males/year."

[2] Subordinate clause forms follow grammatically from the main clause descriptions.

Rate Grammar: Identify the 'part'

1. For women ages 25-34 in 1995, the rate at which they died was 78 per 100k.
2. In 1995 people died from motor vehicle accidents at a rate of 17 per 100,000.
3. For U.S. Black males ages 20-24, suicides occurred in 1995 at a rate of 156 per 100,000.

What kind of rates are these: prevalence or incidence?

[1998 U.S. Statistical Abstract, Tables 148, 149, 151]

Chance Grammar: Overview

Chance family*: chance (60%), risk (28%), odds (8%), likelihood (2%) and probability (2%).

- Describes uncertainty (often qualitative).
- Often used for subjective estimates
The US has a good chance of losing the war.
- ‘Probability’: commonly used in introductory statistics to present conditional ratios, confidence levels and p-values.

* Prevalence within this family in everyday use.

#2: Chance Grammar

Consider a population of 10 million people.

Chance of being killed by lightning is 1 per 10 million.

1. Suppose 90% of population is always inside (indoors). Among those sometimes outside, what is their chance of being killed by lightning?
2. Suppose 10% of the population are sometimes outside and 90% of *these* are inside during a lightning storm. Among those outside during a lightning story, what is their chance of being killed by lightning?

#2: Chance Grammar: Clause Based

Clause grammar is good for descriptions.

C1. _____ have a ____% chance to/of _____
 {whole} # {part}

Startups have a 10% chance to succeed (of succeeding)

Startups have a 10% chance of [being a] success.

Phrase grammar is best for titles and comparisons.

The chance of a randomly selected male being a senior is about 20%.

#2: Chance Grammar: Phrase versus Clause Grammar

If *chance* is followed by a simple preposition phrase, then this phrase always introduces a part.

- Her chance of winning increased

If *chance* is followed by a relative clause or a complex prepositional phrase (containing a clause), then the statement can be ambiguous.

- What is the chance *that* a head on the first flip is followed by a head on the second flip?
- What is the chance *of* a head on the first flip being followed by a head on the second flip?

#2: Chance Grammar: Missing Whole

What is the chance of winning?

What is the chance of lightning?

What is the chance of a Type 1 error

- in a medical test?
- in a hypothesis test/

#3: Ratio Grammar

The numerator and denominator of a ratio can be indicated as follows:

- 1 In the phrase '*ratio of N*', N is the numerator.
E.g., The ratio of N to D; the ratio of men to women.
- 2 If '*ratio of N*' is followed by *to*, *for* or *per* D, then D is the denominator.
E.g., 'ratio of Dollars to Euros; ratio of defaults per 100 loans.
- 3 A hyphen (-) slash (/) or colon (:) in a phrase modifying '*ratio*' indicates the presence of '*to*'. E.g., price-earnings ratios, Euro-Dollar ratio.
- 4 Substantive adjectives that modify *ratio* and precede '*to*' identify the numerator. E.g., price-to-earnings ratio.
- 5 If an adjective phrase modifying '*ratio*' is a single word that is countable, then it typically indicates the numerator. The denominator must be inferred from the context. E.g., the debt ratio.

Ratio Grammar: Examples

1. New York City: lowest ratio of Black police officers to Black residents in the U.S. Too few Black officers?
2. Call-to-order ratio: getting worse. Ratio increasing?
3. Student/teacher ratio. Do parents want high or low?
4. Disciplined: too high testosterone : epitestosterone.
Too much testosterone or too little epitestosterone?
5. Average waist-hip ratio for Miss America: 0.72.
Lower ratio, hourglass figure, higher estrogen levels
Higher ratio, tubular figure, higher testosterone levels.
6. Finance: debt to equity, price-earnings. Numerator?

Chapter 5 Summary

1. Rate: 4 kinds: frequency, incidence, prevalence or change.
2. *Chance* or *ratio* may omit the whole or denominator.

Chapter 5: Key Words, Phrases and Ideas (16)			
Rate Grammar	Per	Frequency	Growth
Prevalence	Incidence	Duration	Phrase vs. Clause
Chance grammar	Chance of/that/to	Odds/risk	probability/likelihood
Ratio Grammar	N to D ratio; N-D ratio	ratio of N to D	ratio of N per D

Ratio Grammars in Titles and Comparisons

Named-Ratio	Title-part	Comparison	Title Example
Percent	No	No	
Percentage	Yes*	Yes	Percentage of Rejects
Rate-phrase	Yes	Yes	Rejection Rate**
Rate-clause	No	Yes	

*Percentage that are rejected.

** Rate of Rejection

StatLit Textbook 2023 Chapter 5 Slides 1 VOC

Statistical Literacy Textbook: Chapter 5 Slides

**Statistical Literacy:
Critical Thinking about Everyday Statistics**

Kendall-Hunt 2023

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5.0, P.217 StatLit Textbook 2023 Chapter 5 Slides 2 VOC

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5.1, P.217 StatLit Textbook 2023 Chapter 5 Slides 3 VOC

Rate, Chance and Ratio Grammars Chapter 5: Learning Outcomes

- 'Rate' keyword is equivocal: frequency, growth, prevalence & incidence.
- Rate grammar has two forms: phrase and clause.
- Chance family: odds, risk, likelihood & probability.
- Describe chance grammar in phrase and clause forms.
- Chance grammar often omits the whole.
- Describe ratios using ratio grammar.
- Recognize inverse in rate, chance and ratio grammars.
- Ratios are easily influenced by choice of denominator.

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5.2, P.218 StatLit Textbook 2023 Chapter 5 Slides 4 VOC

Ratios: A Confounder Solution

CONFOUNDER SOLUTIONS

Inside the Data	Mental: Simple
Effect Size	Selection
Controlled Study	Ratios
Study Design	Standardization
----- Hypothetical thinking -----	

1995 Hispanic Male Texans

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5.2, P.218 StatLit Textbook 2023 Chapter 5 Slides 5 VOC

RATIOS (Using Prepositions)

Common Prepositions : <i>Of, in, for. To [4 to 3; 4-3; 4:3] 4 out of [every] 5; cut in half</i>	Per Grammar: <i>miles per gallon ; mph deaths per 1,000 men</i>
Named-Ratios	Named-Ratios
Ratio Grammar: <i>ratio of women to men student-teacher ratio</i>	Percent Grammar: <i>85% of military personnel are men</i>
Chance Grammar: odds/risk/probability <i>chance of [our] winning; chance that we will win chance to win ; chance for a win</i>	Percentage Grammar: fraction/share <i>percentage of men who bet</i>
Rate Grammar: prevalence, incidence <i>rate of n per d Men died at a rate of n per d</i>	

Light-edge boxes need clause for part and whole (cannot compare ratios).
Dark-edge boxes have part and whole in phrases (can compare ratios)

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5.2, P.218 StatLit Textbook 2023 Chapter 5 Slides 6 VOC

Ch 5: Grammars for Rate, Chance and Ratios

Each of these three grammars have subtle aspects.

1. **Rate grammar** has four kinds of rates. The part-whole rates allow 'of' to introduce the part (rate of death) or the whole (death rate of men).
2. **Chance grammar** may omit the whole (chance of winning) or is ambiguous in identifying the whole (chance that the next flip of a coin will be heads).
3. **Ratio grammar** is terse. Teacher-student ratio or student-teacher ratio. Ratio of men to women or ratio of women to men. The slash (/) means 'per'.

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5.3, P 222 StatLit Textbook 2023 Chapter 5 Slides 7 VOC

Ch 5: Part and Whole for Rate, Chance and Ratios

Part and whole make sense for percentages where the numerator is never bigger than the denominator.

Part and whole don't make sense for ratios where numerators can be bigger than denominators. (20 students per teacher).

Part and whole don't make sense for chance grammar where the part is the uncertain outcome.

Nevertheless, part and whole are used for these three grammars.

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5.3, P 219 StatLit Textbook 2023 Chapter 5 Slides 8 VOC

#1: Rate Grammar

Four kinds of rates (all rates use 'per'):
frequency, prevalence, incidence and growth.

- Frequency: Rate of speed was 60 miles per hour
- Prevalence: Unemployment rate: 5% of workers.
- Incidence: Immigration rate: 0.3% per year in US.
- Growth: population grew at a rate of 10% per year.

Prevalence and *incidence* have a numerator and denominator (called part and whole in this book).
Incidence combines frequency (per unit time) and prevalence (per number in the population).

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5.3, P 220 StatLit Textbook 2023 Chapter 5 Slides 9 VOC

#1: Accidental Death Rate: Frequency (Count)

Among US males in 1990, the accidental *death rate** was three times as big among whites as non-whites.

1990	RACE		
SEX	White	Non-White	ALL
Male	82,940	27,120	110,060
Female	34,210	8,070	42,280
ALL	117,150	35,190	152,340

Including suicide and homicide

* Death rate is a frequency: deaths per year (a count).

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5.3, P 222 StatLit Textbook 2023 Chapter 5 Slides 10 VOC

#1: Accidental Death Rate: Incidence

Among US males in 1990, the accidental *death rate** was almost twice as big among non-whites as whites.

1990	RACE		
SEX	White	Non-White	ALL
Male	81	142	91
Female	32	39	33
ALL	56	88	61

US 1990 Population by race and gender (1,000s)

	White	Non-White	ALL
Male	102,143	49,096	151,239
Female	106,561	20,910	127,471
ALL	208,704	40,006	248,710

1998 U.S. Statistical Abstract, Table 22

1998 U.S. Statistical Abstract, Table 147

* Death rate is incidence: deaths /100,000 population/year.

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5.3, P 223 StatLit Textbook 2023 Chapter 5 Slides 11 VOC

#1: Rate Grammar: Phrase-Based vs clause-Based

Phrase based uses phrases for the part and whole:
Phrases: Adjective-noun or prepositional.
The [accidental death] rate [of men] is ...

Clause-based uses the entire clause:
Clause: includes subject and verb.
Men died at a higher rate this year.

Phrase form is more abstract: better for titles
Clause form is more concrete but longer.

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5.3, P 223 StatLit Textbook 2023 Chapter 5 Slides 12 VOC

#1: Rate Grammar: Phrase-Based

Phrase form is more common than clause form.

Grammar template for phrase-based rate descriptions

R1: The _____ rate of _____ is _____ per _____.
part whole # #

R2: Among _____, the rate of _____ is _____ per _____.
whole part # #

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5.3.2; P 223 StatLit Textbook 2023 Chapter 5 Slides 13 V0C

#1: Rate Grammar

General Rules for Per and Rate Grammar

- Any countable following the keyword *per* is always a whole.
- Named rate grammar include *rate*, *incidence*, and *prevalence*.

Incidence is a ratio involving a time interval (death rate, birth rate).
Prevalence is a ratio taken at a moment in time (unemployment rate).

- In phrase rates, *rate of* introduces either a part or whole.
 The word preceding *rate* is a part if it is countable*.
Rate of introduces a whole if the word before a rate is countable*.
Rate of introduces the part if the word before rate is *not* countable*.

*Uncountable: appositive (the), quantity (8%), evaluation (low) or possessive (men's).

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5.3; P 224 StatLit Textbook 2023 Chapter 5 Slides 14 V0C

#1: Auto Traffic Death Rates

Compare data for 1970 with 1960: deaths vs per miles.
 Compare data for 2020 with 2019.

US Auto Deaths and Rates	1960	1970	1980	1990	2000	2010	2019	2020*
Deaths	38,137	54,633	53,172	46,814	43,354	32,855	33,244	35,766
Per 100,000 resident population			22.5	17.9	14.9	10.6	11.0	11.8
Per 100,000 licensed drivers			35.2	26.7	22.0	15.7	15.8	17.0
Per 100,000 registered vehicles	51.2	49.2	34.8	24.2	19.2	12.6	12.1	13.0
Per 100 million vehicle miles	5.31	4.88	3.30	2.08	1.53	1.11	1.11	1.34

US Statistical Abstract: 2009 Table 1092 Traffic Safety Facts: crashstats.nhtsa.dot.gov 811630, 813141, 813375
<https://injuryfacts.nsc.org/motor-vehicle/historical-fatality-trends/deaths-and-rates/> *Covid March 2020

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5.3.3; P 226 StatLit Textbook 2023 Chapter 5 Slides 15 V0C

#1: Rate Grammar: Clause-Based

Grammar template for clause-rate descriptions

Clause rate grammar can have either the whole or part as the subject. [1]

Main clause rate grammar: "at a rate"

R3: Subject (whole) verb (part) at a rate of N per M.
 Men die accidentally at a rate of 91 per 100,000 per year.

R4: Subject (part) verb (intransitive)
 Accidental death occurs [among/to/for men] at a rate of N per M [whole]

Subordinate-clause rate grammar: "rate at which". [2]

R5 The rate at which subject (whole) verb (part) is N per M.
 The rate at which males died accidentally is 91 per 100,000 per yr.

R6 The rate at which subject (part) verb (intransitive) is N per M whole.
 The rate at which accidental deaths occur among/to/for males is ...

[1] Other forms are possible. E.g., "The U.S. rate is 61 deaths per 100,000 males/year."
 [2] Subordinate clause forms follow grammatically from the main clause descriptions.

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5.3.3; P 226 StatLit Textbook 2023 Chapter 5 Slides 16 V0C

Rate Grammar: Identify the 'part'

- For women ages 25-34 in 1995, the rate at which they died was 78 per 100k.
- In 1995 people died from motor vehicle accidents at a rate of 17 per 100,000.
- For U.S. Black males ages 20-24, suicides occurred in 1995 at a rate of 156 per 100,000.

What kind of rates are these: prevalence or incidence?
 [1998 U.S. Statistical Abstract, Tables 148, 149, 151]

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Chance Grammar: Overview

Chance family*: chance (60%), risk (28%), odds (8%), likelihood (2%) and probability (2%).

- Describes uncertainty (often qualitative).
- Often used for subjective estimates
The US has a good chance of losing the war.
- 'Probability': commonly used in introductory statistics to present conditional ratios, confidence levels and p-values.

* Prevalence within this family in everyday use.

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5.4; P 227 StatLit Textbook 2023 Chapter 5 Slides 18 V0C

#2: Chance Grammar

Consider a population of 10 million people.
 Chance of being killed by lightning is 1 per 10 million.

- Suppose 90% of population is always inside (indoors). Among those sometimes outside, what is their chance of being killed by lightning?
- Suppose 10% of the population are sometimes outside and 90% of *these* are inside during a lightning storm. Among those outside during a lightning story, what is their chance of being killed by lightning?

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5.4, P.228 StatLit Textbook 2023 Chapter 5 Slides 19 V0C

#2: Chance Grammar: Clause Based

Clause grammar is good for descriptions.

C1. _____ have a _____ % chance to/of _____.
 {whole} # {part}
 Startups have a 10% chance to succeed (of succeeding)
 Startups have a 10% chance of [being a] success.

Phrase grammar is best for titles and comparisons.

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5.4, P.228 StatLit Textbook 2023 Chapter 5 Slides 20 V0C

#2: Chance Grammar: Phrase-Based

C2: The chance to/of/at _____ in/among/for _____ is _____.
 {part} {whole} ##
 The chance of success (succeeding) among startups is less than 30%.
 The chance of a head when randomly flipping a fair coin is 50%

C3: _____ chance of _____ is _____.
 {Whole possessive} {part} ##
 Our team's chance of winning is 70%.

C4: The chance that/of _____ is/verb _____ is _____.
 {whole} {part} ##
 The chance that a randomly selected male is a senior is about 20%.
 The chance of a randomly selected male being a senior is about 20%.

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5.4, P.228 StatLit Textbook 2023 Chapter 5 Slides 21 V0C

#2: Chance Grammar: Phrase versus Clause Grammar

If *chance* is followed by a simple preposition phrase, then this phrase always introduces a part.

- Her chance of winning increased

If *chance* is followed by a relative clause or a complex prepositional phrase (containing a clause), then the statement can be ambiguous.

- What is the chance *that* a head on the first flip is followed by a head on the second flip?
- What is the chance *of* a head on the first flip being followed by a head on the second flip?

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5.4, P.228 StatLit Textbook 2023 Chapter 5 Slides 22 V0C

#2: Chance Grammar: Missing Whole

What is the chance of winning?

What is the chance of lightning?

What is the chance of a Type 1 error

- in a medical test?
- in a hypothesis test/

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5.5, P.231 StatLit Textbook 2023 Chapter 5 Slides 23 V0C

#3: Ratio Grammar

The numerator and denominator of a ratio can be indicated as follows:

- In the phrase '*ratio of N*', N is the numerator.
E.g., The ratio of N to D; the ratio of men to women.
- If '*ratio of N*' is followed by *to*, *for* or *per* D, then D is the denominator.
E.g., 'ratio of Dollars to Euros; ratio of defaults per 100 loans.
- A hyphen (-) slash (/) or colon (:) in a phrase modifying '*ratio*' indicates the presence of '*to*'. E.g., price-earnings ratios, Euro-Dollar ratio.
- Substantive adjectives that modify *ratio* and precede '*to*' identify the numerator. E.g., price-to-earnings ratio.
- If an adjective phrase modifying '*ratio*' is a single word that is countable, then it typically indicates the numerator. The denominator must be inferred from the context. E.g., the debt ratio.

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5.5, P.231 StatLit Textbook 2023 Chapter 5 Slides 24 V0C

Ratio Grammar: Examples

- New York City: lowest ratio of Black police officers to Black residents in the U.S. Too few Black officers?
- Call-to-order ratio: getting worse. Ratio increasing?
- Student/teacher ratio. Do parents want high or low?
- Disciplined: too high testosterone : epitestosterone.
Too much testosterone or too little epitestosterone?
- Average waist-hip ratio for Miss America: 0.72.
Lower ratio, hourglass figure, higher estrogen levels
Higher ratio, tubular figure, higher testosterone levels.
- Finance: debt to equity, price-earnings. Numerator?

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5.6, P.332 StatLit Textbook 2023 Chapter 5 Slides 25 V0C

Chapter 5 Summary

1. Rate: 4 kinds: frequency, incidence, prevalence or change.
2. *Chance* or *ratio* may omit the whole or denominator.

Chapter 5: Key Words, Phrases and Ideas (16)			
Rate Grammar	Per	Frequency	Growth
Prevalence	Incidence	Duration	Phrase vs. Clause
Chance grammar	Chance of/that/to	Odds/risk	probability/likelihood
Ratio Grammar	N to D ratio; N-D ratio	ratio of N to D	ratio of N per D

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5.7, P.233 StatLit Textbook 2023 Chapter 5 Slides 26 V0C

Ratio Grammars in Titles and Comparisons

Named-Ratio	Title-part	Comparison	Title Example
Percent	No	No	
Percentage	Yes*	Yes	Percentage of Rejects
Rate-phrase	Yes	Yes	Rejection Rate**
Rate-clause	No	Yes	

*Percentage that are rejected. ** Rate of Rejection

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