



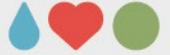
Using APA style for scientific communication (Session 1)

Sebastian Jentschke





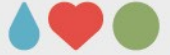
**wiki.uib.no/
psychmethods**



Overview

- Why publishing? Why a rule system?
- structure
- language use
- mechanics of style: punctuation, abbreviations, parentheses, etc.
- figures and tables – some practical hints
- referencing
- your term paper
- publication process
- ethical issues (authorship, consent, plagiarism)





Why publish?

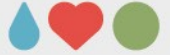
- course requirements (read scientific reports, write up semester projects and theses)
- conduct research / clinical work and further your field
- «currency» of a scientific career (applications, institutional rankings, evaluation of research grants)



CRISTIN

Current Research Information System In Norway





Why publish?

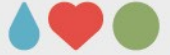
- scientific reasons (inform the scientific community, open critical discussions and stimulate research, avoid duplication of work)
- societal reasons (application of scientific findings, responsibility and benefit for society)
- pragmatic reasons (university education and qualification, scientific job, important for research careers – funding)





**Which standards do
you know?**

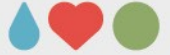
**Why do we have
them and what is
their advantage?**



Why standards?

- enhance productivity (usually the best solution is made standard) and avoids duplication and waste
→ learn it once, apply it many times
- elements are harmonized (e.g., how a result section is written) – JARS: check list
→ increases confidence
- practicality (e.g., makes navigating through articles and review process easier)

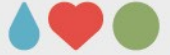




Why publish in a certain style?

- a uniform style facilitates communication
 - author: help to write up research results
 - *express essential information, reduce distraction*
 - *adequate structure and language*
 - *provide statistical information in a uniform way and choose adequate graphical forms*
 - reader: help to read and understand results
- broad dissemination: used in many disciplines beyond psychology: sociology, economics, criminology etc. and by more than 1,000 scientific journals





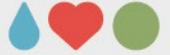
Why publish in APA style?

- simplicity and sobriety: promote simple, clear language and avoid unnecessary “flashy” style
- consistency: the reader knows where to find different kinds of information and concepts are used similarly within and between publications ("Are we talking about the same thing?")
- practical: the manuscript is prepared for publishers' typesetting / workflow



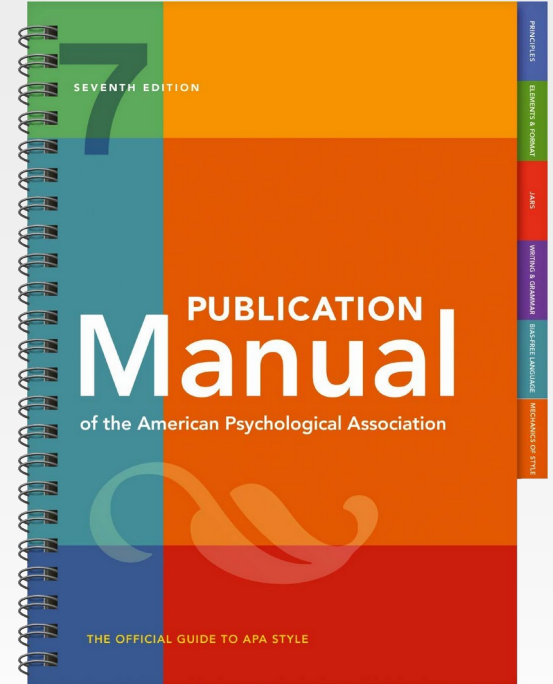


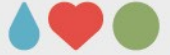
**What do you already
know about the APA
style?**



A bit of history

- 1929: short article in Psychological Bulletin to prepare a set of simple rules (style guide) to facilitate communication of research
- 1952: Publication Manual of the American Psychological Association
- 2019: 7th edition





Content overview – APA manual

Scholarly Writing and Publishing Principles	types of articles; ethical standards: scientific accuracy; participants' rights and welfare; intellectual property rights
Paper Elements and Format	required elements, format, organization, examples
Journal Article Reporting Standards	general reporting standards; specific reporting standards for quantitative, qualitative and mixed methods research
Writing Style and Grammar	scholarly writing style; grammar and usage; strategies: outline, re-read, seek help
Bias-Free Language Guidelines	reducing bias in language (specificity, "labels": gender, disability, SES, racial / ethnic identity)
Mechanics of Style	punctuation; spelling; capitalization; italics; abbreviations; numbers; statistics / mathem.; equations; lists

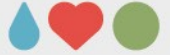




Content overview – APA manual

Tables and Figures	general guidance; tables + examples ; figures + examples
Works Cited in the Text	general guidance; special approaches (e.g., interviews); format of in-text citations; quoting and paraphrasing
Reference List	reference categories; elements (author, date, title, source); variations (translations, etc.); format and order of the reference list
Reference Examples	textual works (e.g., periodicals); data sets, software, tests; audiovisual and online media
Legal References	general guidance; examples (e.g., court decisions; laws and acts; etc.)
Publication process	editorial and publication process; author responsibilities (copyright and permissions)





Types of (scientific) articles

Primary / “original” publications: not previously published, peer-reviewed by experts, archived (for future reference)

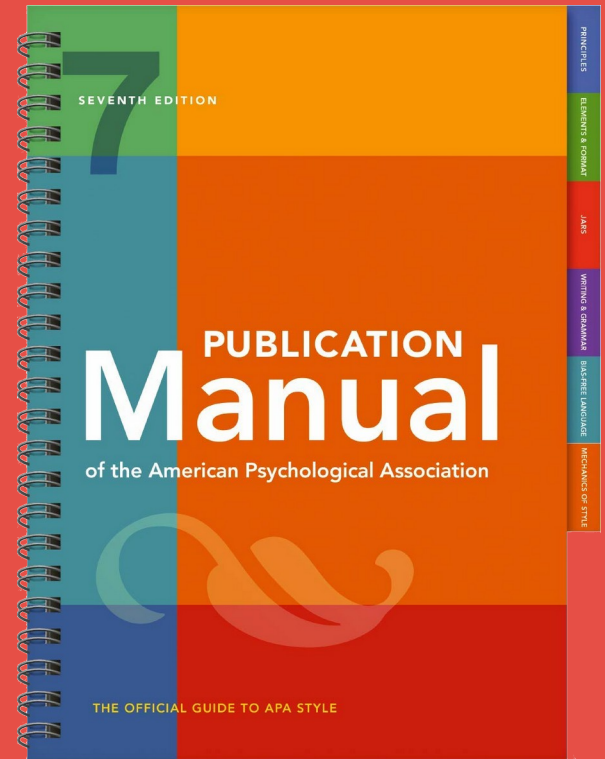
- empirical study
- case study
- literature review
- theoretical article
- methodological article
- brief report, comment, book review, letter to the editor

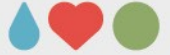
Semester project

- empirical: reports research based on empirical data, tests hypotheses
- report from work as a research assistant
- review: analysing existing literature



Manuscript structure / content *Chapter 2 and 3*

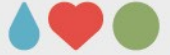




Manuscript structure: IMRaD

- **Introduction:** What is the problem? Why is it interesting?
Background – purpose of investigation – hypotheses
- **Methods:** How was the investigation conducted?
Detailed description of the procedures, enabling replication
- **Results:** What was observed / found?
Report of findings and analyses: values/quantities; tables; figures
- **Discussion:** How can the results be understood?
Summary; interpretation; strengths & limitations; implications
- Title and author information, abstract & keywords; references; acknowledgements, conflict of interest & funding, appendices etc.





Manuscript structure: Hourglass

The article begins broadly becomes more specific until you introduce your own study. Method and results are most specific. The discussion explores the results and their implications.

Individuals differ radically from one another in the degree to which they are willing and able to express their emotions...

In this study, we recorded the emotional reactions of both men and women to filmed...
We hypothesized...

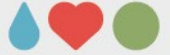
(Method) One hundred male and 100 female undergraduates were shown two movies...

(Results) Table 1 shows...

These results imply that sex differences in emotional expressiveness are moderated by...

If emotions can incarcerate us by hiding our complexity, at least their expression can liberate us by displaying our authenticity.



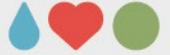


Structure: Headings

- manuscript structure and use of headings is key to clear and “logical” communication
- structure provides impression of manuscript quality
- Note: Formatting rules apply to manuscript preparation (in print different styles may be used)

General rules

- start with level 1, use as many levels as required
- no heading “Introduction” (APA) – some journals use
- headings are hierarchically organized (sub-headings “belong to” the previous, higher headline)
- headings are in the same font as the text, but differ in alignment and style (bold and italic)



Manuscript structure: Headings

For the whole manuscript: double-spaced; e.g., Times Roman (12 pt)

Previous paragraph ends here.

Level 1: Centered, Bold, Title Case Heading

The text starts here...

... and ends here.

Level 2: Flush Left, Bold, Title Case Heading

The text starts here...

Level 3: Flush Left, Bold + Italic, Title Case Heading

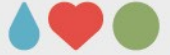
The text starts here...

Level 4: Indented, Bold, Title Case Heading, ending with period. The text starts here...

Level 5: Indented, Bold + Italic, Title Case Heading, ending with period. The text starts here...

<https://apastyle.apa.org/style-grammar-guidelines/paper-format>





Manuscript structure: Headings

If the text requires only one level, use Level 1.
Typical for short articles (e.g., term papers)

Manuscript Title

Introduction, introduction, introduction, introduction.

Method

Method, method, method, method, method, method.

Results

Results, results, results, results, results, results.

Discussion

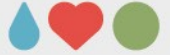
Discussion, discussion, discussion, discussion.

Level 1

Level 1

Level 1

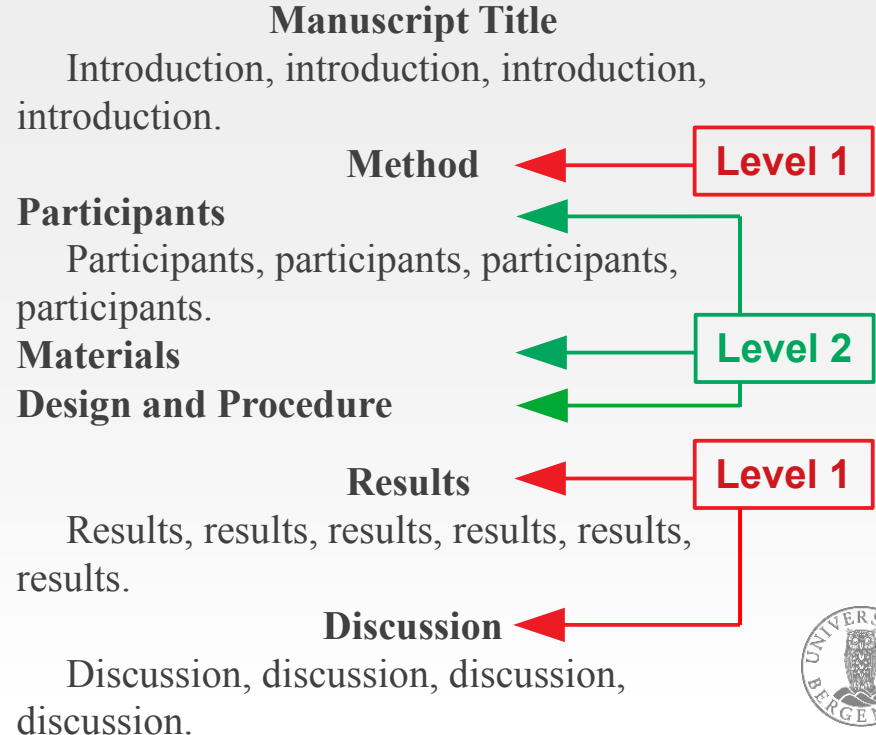


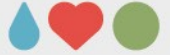


Manuscript structure: Headings

If the text requires two levels, use Level 1 and 2.

Typical for empirical articles (and empirical term papers).

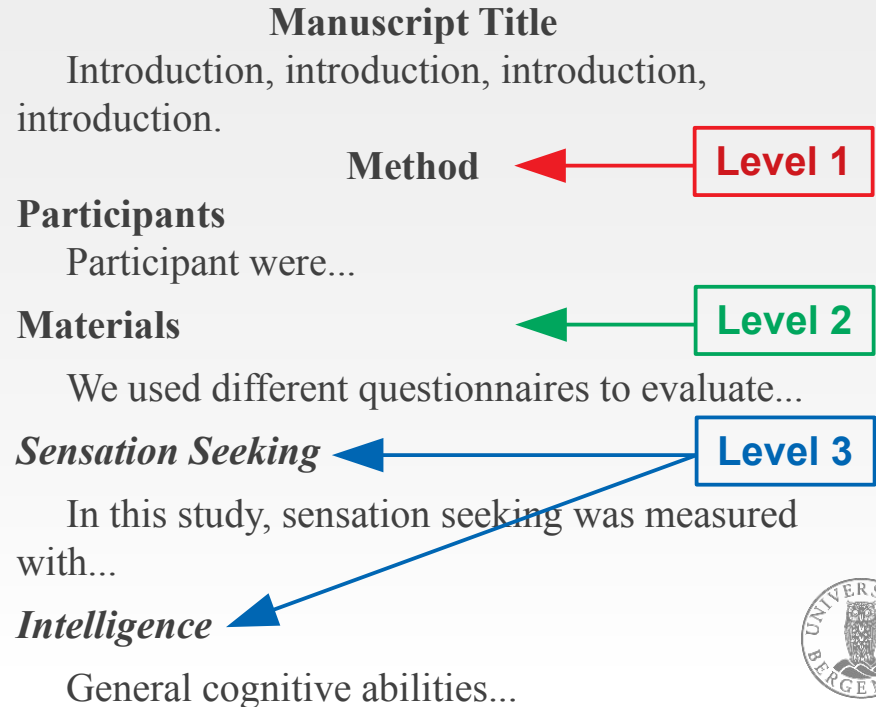




Manuscript structure: Headings

If the text requires three levels, use Level 1, 2 and 3.

More than three levels are rarely necessary. If it is, then use Level 4 or even 5.





Manuscript structure: JARS

- provide a checklist / questions ensuring that your manuscript covers all necessary information
 - specifically tailored for different kinds of manuscripts, e.g., experimental designs, meta-analyses
 - also provides help how to structure your manuscript
- <https://apastyle.apa.org/jars>

Introduction

Problem

- State the importance of the problem, including theoretical or practical implications.

Review of Relevant Scholarship

- Provide a succinct review of relevant scholarship, including
 - relation to previous work
 - differences between the current report and earlier reports if some aspects of this study have been reported on previously

Hypothesis, Aims, and Objectives

- State specific hypotheses, aims, and objectives, including
 - theories or other means used to derive hypotheses
 - primary and secondary hypotheses
 - other planned analyses
- State how hypotheses and research design relate to one another.

Method

Inclusion and Exclusion

- Report inclusion and exclusion criteria, including any restrictions based on demographic characteristics.

Participant Characteristics

- Report major demographic characteristics (e.g., age, sex, ethnicity, socioeconomic status) and important topic-specific characteristics (e.g., achievement level in studies of educational interventions).



Manuscript structure: Introduction

Opening statement: introduce background and nature of the problem investigated

1. Use prose, not jargon.
2. Don't plunge readers into the middle of your problem... lead them step by step.
3. Open with a statement about people... not psychologists / specialists and their research.

Wrong: Several years ago, Ekman (1972), Izard (1977), ... pointed to psychology's neglect of the affects and their expression...

Right: Individuals differ from one another in the degree to which they are willing and able to express their emotions...



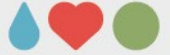


Manuscript structure: Introduction

Review the existing literature: Summarize the current state of knowledge in the area. Build an argument based upon which aspects of knowledge exist. Identify one (or more) gaps that you would like to fill in.

1. do not simply list studies; try to integrate them in your argument and tell a coherent «story», e.g., historical progression, studies building upon another
2. avoid non-essential details
3. if you criticize: criticize the work, not the author(s) of a study
4. cite others generously





Manuscript structure: Introduction

Aims / hypotheses: Identify one (or more) gaps.

- ***theoretical***: aims one wishes to fulfil (e.g., providing an overview over ...; propose a model for...)
- ***empirical***: scientific hypothesis (concepts) → statistical hypothesis (methods / results – testable: operationalisation → statistical procedure)
- generally: start with broad hypotheses and name more specific ones afterwards





Manuscript structure: Methods

Describe the method in such a detail that the study can be replicated.

Participants

Who participated?

How recruited?

Incentive/reward?

Response rate/dropout?

Age (M, SD), sex distribution, other variables of relevance to the topic.

Procedure

steps of the investigation (e.g., in which order where stimuli presented, which questionnaires were administered, approximate duration)

give a feel of what it was like to be a participant

Material

Questionnaires, stimuli, special equipment, ...

Full materials often as appendix (or online: Open Science Framework)

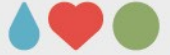
Design / Statistical analyses

independent / dependent variables
techniques for controlling error variance (randomization, balancing)

analysis methods (ANOVA, t-test, etc.)

use labels that are easy to recognize: “group 1 and 2” vs. “1\$- and 20\$-group”



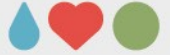


Manuscript structure: Results

- “Give the forest first and then the trees.”
 - central findings first (focus on your experimentally manipulated variables)
 - state a finding, then elaborate / qualify it.
- relate results to your hypotheses

We hypothesized that men would be more emotionally expressive than women and expected that men should produce more tears during the presentation of film clips... As summarized in Table 1, men do cry more... in all four conditions produced an average of 1.4 cc more tears than women ($F_{(1,112)} = 5.79, p < .025$). Only in the ... condition did the men fail to produce more tears. However, this effect did not reach significance. Except for the ... condition, the hypothesis that men cry more received empirical support.





Manuscript structure: Discussion

- begin by **summarizing** the **central results** of the study, which of your **hypotheses** were confirmed?
- **relate** the findings **to existing research**; proceed from specific matters to more general ones (hourglass)
- do not simply repeat the results, **interpret** them: what inferences can be drawn? **implications** (clinical, societal, etc.)
- **strengths & limitations** of the study: which questions remain unanswered? negative or unexpected results? suggestions to answer these questions?
- don't end with "Further research is needed ...", but with a **strong take home message**





Structure: Title and abstract

Goal: Provide a quick overview for the reader

Should reflect the content accurately, include important keywords (for literature search), and be composed / revisited after article completion

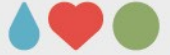
Title

- length: 10-12 words
- fully explanatory by itself
- mention the most important aspect(s): main variables, methods, theoretical issues
- identify the populations studied

Abstract

- about 150 words, no paragraph
- cover: background, participants & method, findings, conclusions and implications
- remove unnecessary words & details, write clearly ...





Structure: Title and abstract

Neural correlates of music-syntactic processing in two-year old children

Music is a basic and ubiquitous socio-cognitive domain. However, our understanding of the time course of the development of music perception, particularly regarding implicit knowledge of music-syntactic regularities, remains contradictory and incomplete. Some authors assume that the acquisition of knowledge about these regularities lasts until late childhood, but there is also evidence for the presence of such knowledge in four- and five-year-olds. To explore whether such knowledge is already present in younger children, we tested whether 30-month-olds (N = 62) show neurophysiological responses to music-syntactically irregular harmonies. We observed an early right anterior negativity in response to both irregular in-key and out-of-key chords. The N5, a brain response usually present in older children and adults, was not observed, indicating that processes of harmonic integration (as reflected in the N5) are still in development in this age group. In conclusion, our results indicate that 30-month-olds already have acquired implicit knowledge of complex harmonic music-syntactic regularities and process musical information according to this knowledge.





Structure: Example manuscript

COMPARISON OF STUDENT EVALUATIONS OF TEACHING 1

Comparison of Student Evaluations of Teaching With Online and Paper-Based Administration

Claudia J. Stanny¹ and James E. Arruda²

¹Center for University Teaching, Learning, and Assessment, University of West Florida

²Department of Psychology, University of West Florida

Author Note

Data collection and preliminary analysis were sponsored by the Office of the Provost and the Student Assessment of Instruction Task Force. Portions of these findings were presented as a poster at the 2016 National Institute on the Teaching of Psychology, St. Pete Beach, Florida, United States. We have no conflicts of interest to disclose.

Correspondence concerning this article should be addressed to Claudia J. Stanny, Center for University Teaching, Learning, and Assessment, University of West Florida, Building 53, 11000 University Parkway, Pensacola, FL 32514, United States. Email: cstanny@institution.edu

COMPARISON OF STUDENT EVALUATIONS OF TEACHING 2

Abstract

When institutions administer student evaluations of teaching (SETs) online, response rates are lower relative to paper-based administration. We analyzed average SET scores from 364 courses taught during the fall term in 3 consecutive years to determine whether administering SET forms online for all courses in the 3rd year changed the response rate or the average SET score. To control for instructor characteristics, we based the data analysis on courses for which the same instructor taught the course in each of three successive fall terms. Response rates for face-to-face classes declined when SET administration occurred only online. Although average SET scores were reliably lower in Year 3 than in the previous 2 years, the magnitude of this change was minimal (0.11 on a five-item Likert-like scale). We discuss practical implications of these findings for interpretation of SETs and the role of SETs in the evaluation of teaching quality.

Keywords: college teaching, student evaluations of teaching, assessment

<https://apastyle.apa.org/style-grammar-guidelines/paper-format/professional-annotated.pdf>

COMPARISON OF STUDENT EVALUATIONS OF TEACHING 3

Comparison of Student Evaluations of Teaching With Online and Paper-Based Administration

Student ratings and evaluations of instruction have a long history as sources of information about teaching quality (Berk, 2013). Student evaluations of teaching (SETs) often play a significant role in high-stakes decisions about hiring, promotion, tenure, and teaching awards. As a result, researchers have examined the psychometric properties of SETs and the possible impact of variables such as race, gender, age, course difficulty, and grading practices on average student ratings (Griffin et al., 2014; Nulty, 2008; Spooren et al., 2013). They have also examined how decision makers evaluate SET scores (Boysen, 2015a, 2015b; Boysen et al., 2014; Dewar, 2011). In the last 20 years, considerable attention has been directed toward the consequences of administering SETs online (Morrison, 2011; Stowell et al., 2012) because low response rates may have implications for how decision makers should interpret SETs.

Online Administration of Student Evaluations

abstract, 2.9;
section labels, 2.28

professional
title page, 2.3

keywords, 2.10

running head, 2.8

title, 2.4, Table 2.1

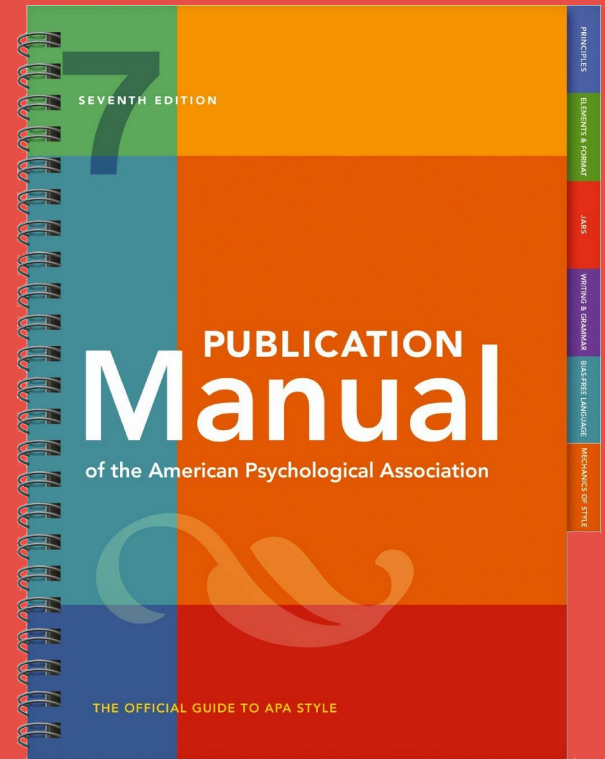
parenthetical citation
of a work with one
author, 8.17

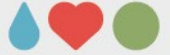
parenthetical citation
of multiple works, 8.12

parenthetical citation
for works with the
same author and
same date, 8.19

Level 2 heading in the
introduction, 2.27,
Table 2.3, Figure 2.4

Writing style *Chapter 4 and 5*





Writing style

Three strategies to improve writing:

1. Planning: identify ideas, draft an outline / scaffold, define structure → elaborate the structure
2. Incubation: write a draft and put it aside for a while → re-read and re-write
3. Feedback: write your paper and ask colleague(s) for comments → re-write according to review

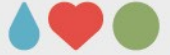




Writing style: Structure / Continuity

- aim for a continuous thematic development
 - continuity in words and concepts; don't use synonyms for important concepts (e.g. “tattooing” vs. “body art”, “body modification”)
 - use repetition: same word, same meaning
 - use parallel construction: repetition of sentence structure
- use transitional devices
 - time links: First, ...; Next, ...; After, ...; While, ...
 - cause-effect links: Thus, ...; Therefore, ...; Consequently, ...
 - addition links: In addition, ...; Moreover, ...; Similarly, ...
 - contrast links: Conversely, ...; However, ...; Although...





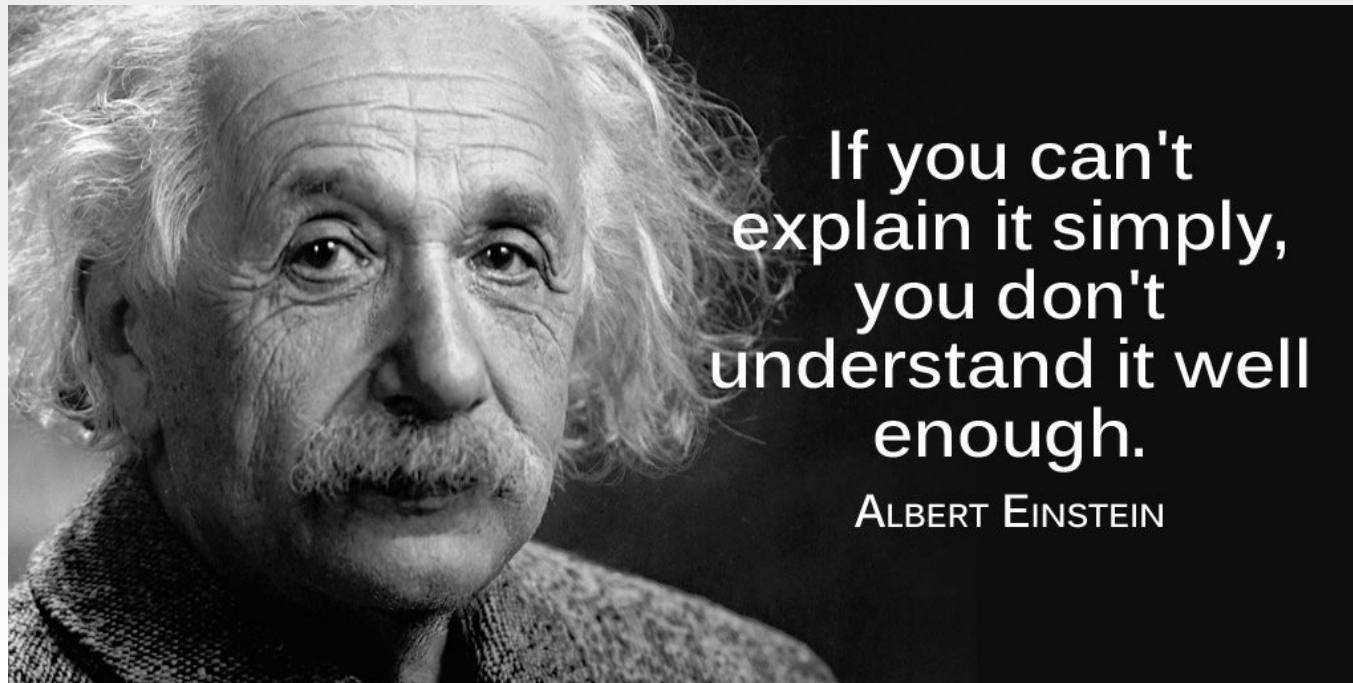
Writing style: Brief and concise

- “It’s important what you write, not how you write”?
No: Good content may be lost in bad language, style, structure.
- “The longer the better”?
 - parsimony and brevity is a scientific virtue
 - evaluation based on quality, not quantity
 - journals have space / word limits (e.g.,
Scientific reports: «should be no more than 4,500 words»;
Current Biology: «usually limited ... to around 5000 words»)





Writing style: Brief and concise





Writing style: brief and concise

equipment, and to Dr. G. E. R. Deacon and the captain and officers of R.R.S. *Discovery II* for their part in making the observations.
*Young, F. B., Gerard, H., and Jevons, W., *Phil. Mag.*, **66**, 119 (1913).
*Langer, H., *Mon. Not. Roy. Astr. Soc., Geophys. Supp.*, **6**, 76 (1915).
*Van Arman, W. S., Woods Hole Papers in Phys. Oceanogr., Meteor., **11**, 131 (1932).
*Kinnon, V. W., *Ann. Met. Aerol. Phys. (Oxford)*, **1**, 151 (1935).

MOLECULAR STRUCTURE OF NUCLEIC ACIDS

A Structure for Deoxyribonucleic Acid
WE wish to suggest a structure for the salt of deoxyribonucleic acid (D.N.A.). This structure has novel features which are of considerable biological interest.
A structure for nucleic acid has already been proposed by Pauling and Corey¹. They kindly made their manuscript available to us in advance of publication. Their model consists of three intertwined chains, with the phosphates near the fibre axis, and the bases on the outside. In our opinion, this structure is unsatisfactory for two reasons: (1) We believe that the material which gives the X-ray diagram in the salt, not the free acid. Without the acidic hydrogen atoms it is not clear what forces would hold the structure together, especially as the negatively charged phosphates are near the axis and repel each other. (2) Some of the van der Waals distances appear to be too small; chains that are too close together would hold the structure together, especially as the negatively charged phosphates are near the axis and repel each other. (3) Some of the van der Waals distances appear to be too small; chains that are too close together would hold the structure together, especially as the negatively charged phosphates are near the axis and repel each other.

Another three-chain structure has also been suggested by Frazer (in the press). In his model the phosphates are on the outside and the bases on the inside, linked together by hydrogen bonds. This structure as described is rather ill-defined, and for this reason we shall not comment on it.
We wish to put forward a radically different structure for the salt of deoxyribonucleic acid. This structure has two helical chains each coiled round the same axis (see diagram). We have made the usual chemical assumptions, namely, that each chain consists of phosphate di-ester groups joining β-D-deoxyribose residues with 3',5' linkages. The two chains (but not their bases) are related by a dyad perpendicular to the fibre axis. Both chains follow right-handed helices, but owing to the dyad the sequences of the atoms in the two chains run in opposite directions. Each chain, however, resembles Furburgh's model No. 1; that is, the bases are on the inside of the helix and the phosphates on the outside. The configuration of the sugar and the atoms near it is close to Furburgh's 'standard configuration', the sugar being roughly perpendicular to the attached ions. There



This figure is partly schematic. The two chains are intertwined around the same axis. The bases are on the inside of the helix and the phosphates on the outside. The configuration of the sugar and the atoms near it is close to Furburgh's 'standard configuration', the sugar being roughly perpendicular to the attached ions. There

is a residue on each chain every 3-4 Å, in the direction. We have assumed an angle of 36° between adjacent residues in the same chain, so that the structure repeats after 10 residues on each chain, that is after 34 Å. The distance of a phosphate atom from the fibre axis is 10 Å. As the phosphates are on the outside, cations have easy access to them.
The structure is an open one, and its water content is rather high. At lower water contents we would expect the bases to tilt so that the structure could become more compact.

The novel feature of the structure is the manner in which the two chains are held together by the purine and pyrimidine bases. The planes of the bases are perpendicular to the fibre axis. They are joined together in pairs, a single base from one chain being hydrogen-bonded to a single base from the other chain, so that the two lie side by side with identical z-co-ordinates. One of the pair must be a purine and the other a pyrimidine for bonding to occur. The hydrogen bonds are made as follows: purine position 1 to pyrimidine position 1; purine position 6 to pyrimidine position 6.

If it is assumed that the bases only occur in the structure in the most plausible tautomeric forms (that is, with the keto rather than the enol configurations) it is found that only specific pairs of bases can bond together. These pairs are: adenine (purine) with thymine (pyrimidine), and guanine (purine) with cytosine (pyrimidine).
In other words, if an adenine forms one member of a pair, on either chain, then on those assumptions the other member must be thymine; similarly guanine and cytosine. The sequence of bases on a single chain does not appear to be restricted in any way. However, if only specific pairs of bases can be adopted, it follows that the sequence on the other chain is given, then the sequence on the other chain is automatically determined.
It has been found experimentally² that the ratio of the amounts of adenine to thymine, and the ratio of guanine to cytosine, are always very close to unity for deoxyribonucleic acid.

It is probably impossible to build this structure with a ribose sugar in place of the deoxyriboses, as the oxygen atoms would make too close a van der Waals contact.
The previously published X-ray data³ on deoxyribonucleic acid are too few for a rigorous test of our structure. So far as we can tell, it is roughly compatible with the experimental data, but it must be regarded as unproved until it has been checked against more exact results. Some of those are given in the following communications. We were not aware of the details of the results presented there when we devised our structure, which rests mainly though not entirely on published experimental data and stereochemical arguments.
It has not escaped our notice that the specific pairing we have postulated immediately suggests a possible copying mechanism for the genetic material.
Full details of the structure, including the conditions assumed in building it, together with a list of co-ordinates for the atoms, will be published elsewhere.
We are much indebted to Dr. Jerry Donohue for constant advice and criticism, especially on interatomic distances. We have also been stimulated by a knowledge of the general nature of the unpublished experimental results and ideas of Dr. M. H. F. Wilkins, Dr. R. E. Franklin and their co-workers at

King's College, London. One of us (J. D. W.) has been aided by a fellowship from the National Foundation for Infantile Paralysis.

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F. H. C. CRICK
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Cavendish Laboratory, Cambridge.

- *Pauling, L., and Corey, R. B., *Nature*, **137**, 140 (1935); *Proc. U.S. Nat. Acad. Sci.*, **35**, 14 (1950).
- *Franklin, R. E., *Acta Cryst.*, **4**, 614 (1952).
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- *Arden, W. L., *Temp. Soc. Exp. Biol.*, **1**, Nucleic Acid, 66 (Camb. Univ. Press, 1947).
- *Wilkins, M. H. F., and Bernal, J. T., *Biochim. et Biophys. Acta*, **10**, 142 (1953).

Molecular Structure of Deoxyptentose

WRITE the biological properties of deoxyptentose nucleic acid suggest a molecular structure containing great complexity. X-ray diffraction studies described here (cf. Astbury¹) show the basic molecular configuration has great simplicity. The purpose of this communication is to describe, in a preliminary way, some of the experimental evidence for the polynucleotide chain configuration being helical, and existing in this form when in the natural state. A fuller account will be published elsewhere.

The structure of deoxyptentose nucleic acid is the same in all species (although the nitrogen base ratios alter considerably in nucleotides, extracted or in cells, and in purified nucleate). The same linear group of polynucleotide chains may pack together parallel in different ways to give crystalline², semi-crystalline³ or amorphous material. In all cases the X-ray diffraction photograph consists of two regions, one determined largely by the regular spacing of nucleotides along the chain, and the other by the longer spacing of the chain configuration. The sequence of different nitrogen bases along the chain is not made visible.

Oriented paracrystalline deoxyptentose nucleic acid (structure *B*) in the following communication by Franklin and Gosling⁴ gives a five diagram as shown in Fig. 1 (cf. ref. 4). Astbury suggested that the strong reflexion corresponding to the inter-nucleotide repeat along the fibre axis. The ~34 Å layer lines, however, are not due to a repeat of a polynucleotide composition, but to the chain configuration repeat, which causes strong diffraction as the nucleotide chains have higher density than the interstitial water. The absence of reflexions on or near the meridians immediately suggests a helical structure with axis parallel to fibre length.

Diffraction by Helices
It may be shown⁵ (also Stokes, unpublished) that the intensity distribution in the diffraction pattern of a series of points equally spaced along a helix is given by the squares of Bessel functions. A uniformly distributed helix gives a series of layer lines corresponding to the helix pitch, the intensity of each layer line being proportional to the square of J_n , the *n*th order Bessel function. A straight line may be drawn approximately through

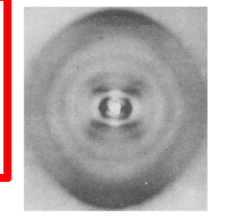


Fig. 1. Five diagram of deoxyptentose nucleic acid from *B. coli*. Fibre axis vertical.

the innermost maxima of each Bessel function and the origin. The angle this line makes with the equator is roughly equal to the angle between an element of the helix and the helix axis. If a unit repeats a times along the helix there will be a meridional reflexion (J_0) on the *n*th layer line. The helical configuration produces side-bands on this fundamental frequency; the effect being to reproduce the intensity distribution about the origin around the new origin, on the *n*th layer line, corresponding to it in Fig. 2. We will now briefly analyse in physical terms some of the effects of the shape and size of the repeat unit or nucleotide on the diffraction pattern. First, if the nucleotide consists of a unit having mirror-symmetry about an axis parallel to the helix axis, the whole diffraction pattern is modified by the form factor of the nucleotide. Second, if the nucleotide consists of a series of points on a radius at right-angles to the helix axis, the phases of radiation scattered by the helices of different diameter passing through each point are the same. Summation of the corresponding Bessel functions gives reinforcement for the inner-

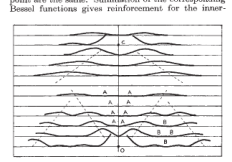


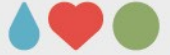
Fig. 2. Diffraction pattern of system of helices corresponding to a series of points on a radius at right-angles to the helix axis. The phases of radiation scattered by the helices of different diameter passing through each point are the same. Summation of the corresponding Bessel functions gives reinforcement for the inner-

~900 words
(+70 words credits)

6 references

~1000 citations
Nobel prize for physiology and medicine 1962



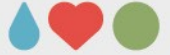


Writing style: Brief and concise

- avoid wordiness and redundancy
 - they were both alike
 - a total of 68 participants
 - four different groups saw
 - has been previously found
 - small in size
 - period of time
 - at the present time
 - the reason is because
 - very close to significance
 - based on the fact that

**Which passages
parts of those
expressions are
too wordy or
redundant?**





Writing style: Brief and concise

- avoid wordiness and redundancy
 - they were both alike
 - a total of 68 participants
 - four different groups saw
 - has been previously found
 - small in size
 - period of time
 - at the present time → now
 - the reason is because
 - very close to significance
 - based on the fact that → because





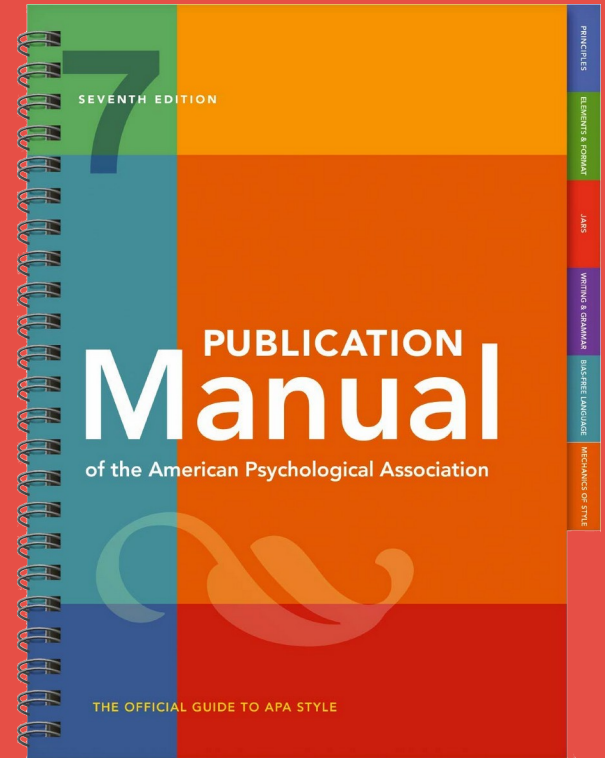


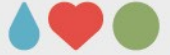
Writing style: Language

- use of past and present
past: for everything that (a) you or your participants did in your study; or (b) has been done and written about in the literature
present: when talking about (a) findings in front of the reader; or (b) conclusions that were/are true
- avoid sexist connotations
“policeman” → “police officer”; “chairman” → “chairperson”
“they” or “their” is endorsed as a gender-neutral pronoun
- avoid “labelling” and use accepted designations
“schizophrenics” → “people diagnosed with schizophrenia”
“homosexuals” → gay men, lesbians, transgender people



Mechanics of style *Chapter 6*





Mechanics of style: Period (.)

- + to end a complete sentence: ...ends here.
- + initials of names: J. R. Smith
- + for Latin abbreviations: cf., i.e., vs., ...
- + for reference abbreviations: Vol. 1, p. 6, pp. 7-9

- acronyms: APA, SSB, ...
- US state names: NY; Washington, DC
- measurement abbreviations (ISO): cm, kg, min (but: in. = inch)
- web addresses in text («look up <https://www.apa.org>.»
→ «look up the APA website (<https://www.apa.org>).»)

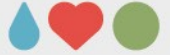




Mechanics of style: Comma (,)

- + in series of 3 and more items: «the height, width, or depth»
- + after an *introductory phrase*: «*In this section*, we discuss...»
- + to set off a *nonessential or nonrestrictive clause*: «fearful faces, *which are rarely seen in everyday life*, convey...»
- + statistics adjacent to parentheses: «F(2, 71) = 3.38, p < .04»
- + to set off the year in dates: «April 18, 1992, was the date...»
- + to set off the year in reference citations: (Patrick, 1993)
- + to separate groups of three digits: 1,000 = one thousand
- to separate parts of measurements: 8 years 2 months; 3 min 41 s

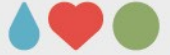




Mechanics: Quotation marks (“” “”)

- + *for irony, invented expressions, labels (only first time usage): the “good-outcome” variable ... the value of the good-outcome variable; what is considered as “normal” behaviour...*
- + *to set off the title of an article in the text: Riger’s (1992) article, “Epistemological debates, ...”, was cited...*
- + *to reproduce materials or instructions: The first item was “could be expected to...”*
- *for anchors of a scale (use italics): ranging from 1 (all) to 5 (never)*
- *to highlight technical terms: compared to meta-analysis, a ...*





Mechanics: Quotation marks (“” “”)

- use double quotation marks to enclose quotations in text
The “placebo effect” disappeared...
but single quotation marks to mark quotations within a quote
Miele (1993) found that “the ‘placebo effect’ disappeared...”
- don’t use “” at begin or end of block quotations (> 40 words):
Miele (1993) found:
 The “placebo effect” disappeared when... (p. 276). Block quote (contd.). ...
 Block quote (contd.). ...
In another study... (next sentence after block quotation)





Mechanics of style: Parentheses ()

- + to set off independent elements
- + to introduce abbreviations
- + for letters/numbers in enumerations
- + to set off reference citations in text
- + to enclose the citation or page of a direct quotation
- + to enclose statistical values / degrees of freedom
- within parentheses (...(...)), use ([])
- **not back to back**, use ;

Examples:

were statistically significant (see Figure 5).

...the galvanic skin response (GSR).

...including: (a) synonyms ..., (b) descriptors ..., and (c) symptoms ...

Dumas and Dore (1991) reported ... described elsewhere (Hong & O'Neil, 1992)

The author stated “the effect disappeared...” (Lopez, 1993, p. 311).

This effect was significant ($p = .031$).

$t(75) = 2.19$ / $F(2, 116) = 3.71$

Not: (the galvanic response (GSR)).

But: (the galvanic response [GSR]).

Not: (e.g., optimism) (Cantor, 1986).

But: (e.g., optimism; Cantor, 1986).





Mechanics of style: Brackets []

- ! *use brackets infrequently*
- + to enclose the limits of a confidence interval (CI)
- + to enclose material inserted in a quotation not by the original writer within parentheses
- don't use them if commas are sufficient to set off statistics that include parentheses

Examples:

95% CIs [-7.2, 4.3] and [9.2, 12.4].

“when [his and others’] behavior were studied” (Hanisch, 1992, p. 24).

(The results of the control group [n = 8] are also reported in Figure 2.)

Not: (as Imai [1990] has concluded).

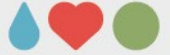
But: (as Imai, 1990, has concluded).

Not: significant (t[75] = 7.4, p < .01).

Not: significant [t(75) = 7.4, p < .01].

But: significant, t(75) = 7.4, p < .01.





Mechanics of style: Italics

- ! ***use italics infrequently***
- + titles of books, films etc.
- + introduction of terms, labels etc.
- + words that could be misread
- common foreign phrases
- mere emphasis
- letters used as abbreviations
- + letters used as statistical symbols
- Greek letters
- + journal & volume (not the issue) in reference list

Examples:

The book *The Elements of Style*...

The term *backward masking* means...

the box labelled *empty* was...

the *small* group [label not size]

Not: *a priori*, *per se*, *vis-à-vis*, ...

Not: *is not proposed* as a stage theory of developments...

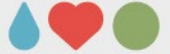
Not: inter-trial interval (*ITI*)

Cohen's *d*; *p*-value; *df* = 3

Not: α , β , γ , δ , ϵ , ...

American Psychologist, 26(1), 46-67.





Mechanics of style: Abbreviations

- ! **use abbreviations sparingly, don't use unfamiliar abbreviations (difficult to remember, especially if used infrequently)**
- must be written out when first mentioned: ... heart rate variability (HRV)
Tip: make a table / list of abbreviations for yourself and look for the first occurrence within the text once you finished the draft
- unless they are common knowledge
as abbreviations: IQ, EU, APA, HIV, AIDS, etc.
units of measurement: h / hr, min, s, ms, kg, etc.
common Latin abbreviations:
(a) primarily used in parentheses: *cf.* = compare, *e.g.* = for example, *etc.* = and so forth, *i.e.* = that is, *NB:* = please note that..., *viz.* = namely, *vs.* = versus
(b) permitted in text: *and others* = *et al.*

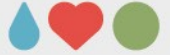




Mechanics of style: Numbers

- use numerals only for 10 and more: In total, five students dropped out. In total, 10 students dropped out.
- use number words to start a sentence: Fifty-five percent of the students completed all tasks, 12% completed three tasks, eight percent...
- use number words for fractions: One fifth of the class. A two thirds majority.
- combine numerals and words to increase clarity: «2 two-way interactions»; «10 seven-point scales»;
but ranks: «The first two items»; not: «The 1st two items» or: «The first 2 items»
- use a zero before the decimal point only when the statistic / function can exceed 1: 0.23 cm; Cohen's $d = 0.70$; 0.48 s
- report exact p values to two or three decimal places: $p = .03$; write $p < .01$ for p values less than .01; $p = .031$; write $p < .001$ for p values less than .001





Summary

- why scientific findings should be published and why there are standards for scientific presentation
- how a scientific report in psychology should look like
- how to write in a scientific style
- how to present your results
- how to refer appropriately to the work of others
- how to write your own papers and theses
- how the publication process works and how to deal with ethical issues (authorship, plagiarism, etc.)





How / where can you get help?

- <https://apastyle.apa.org/>; <https://apastyle.apa.org/jars>
- <https://www.unit.no/tjenester/norsk-apa-referansestil>
- examples in the **APA manual**

sample papers (pp. 50 – 67)

<https://apastyle.apa.org/style-grammar-guidelines/paper-format/sample-papers>

table checklist and examples (pp. 207; 210 – 223)

<https://apastyle.apa.org/style-grammar-guidelines/tables-figures/sample-tables>

figure checklist and examples (pp. 232; 234 – 250)

<https://apastyle.apa.org/style-grammar-guidelines/tables-figures/sample-figures>

reference overview and examples (pp. 313 – 352)

<https://apastyle.apa.org/style-grammar-guidelines/references/examples>





Literature

American Psychological Association (Ed.). (2019). *Publication manual of the American Psychological Association* (7th ed.). American Psychological Association. <https://doi.org/10.1037/0000165-000>

Chapters 1 (pp. 3-26), 2 (pp. 29-67), 3 (pp. 71-108), 4 (pp. 111-127), 8 (pp. 253-278), and 9 (pp. 281-309) are mandatory. This book is a reference work and is relevant for term papers, theses, research, etc.

Sternberg, R. J. (Ed.) (2018). *Guide to publishing in psychology journals* (2nd ed.). Cambridge University Press. <https://doi.org/10.1017/9781108304443>
Many practical tips on how to write empirical papers and literature reviews.

Rosnow, R. L., & Rosnow, M. (2011). *Writing papers in psychology* (9th ed.). Cengage Learning.

A good book for students writing term papers in APA-style.

Bem, D. J. (1995). Writing a review article for *Psychological Bulletin*. *Psychological Bulletin*, 118, 172-177. <https://doi.org/10.1037/0033-2909.118.2.172>
Entertaining introduction to the art of article writing





**Thank you very much
for your attention!**