



ANSI/NISO Z39.14-1997 (R2015)

ISSN: 1041•5653

Guidelines for Abstracts

Abstract: Guidance is presented for authors and editors preparing abstracts that represent the content of texts reporting on the results of experimental work or descriptive or discursive studies. Suggestions for the placement of abstracts within publications or other media are given, along with recommendations for abstracting specific documents. Types of abstracts and their content are described. Also included are suggestions on the style of abstracts and a list of selected readings on the subject of abstracting. Examples of abstracts are appended.

An American National Standard
Developed by the
National Information Standards Organization

Approved November 27, 1996 by the
American National Standards Institute
Reaffirmed January 21, 2015

Published by the National Information Standards Organization
Baltimore, Maryland, U.S.A.

ANSI/NISO Z39.14-1997 (R2015)

About NISO Standards

NISO standards are developed by the Working Groups of the National Information Standards Organization (NISO) with oversight from a Topic Committee. The development process is a strenuous one that includes a rigorous peer review of proposed standards open to each NISO Voting Member and any other interested party. Final approval of the standard involves verification by the American National Standards Institute that its requirements for due process, consensus, and other approval criteria have been met by NISO. Once verified and approved, NISO Standards also become American National Standards.

This standard may be revised or withdrawn at any time. For current information on the status of this standard contact the NISO office or visit the NISO website at:

<http://www.niso.org>

Published by
NISO Press
3600 Clipper Mill Road, Suite 302
Bethesda, MD 21211
www.niso.org

Copyright ©2015 by the National Information Standards Organization
All rights reserved under International and Pan-American Copyright Conventions. For noncommercial purposes only, this publication may be reproduced or transmitted in any form or by any means without prior permission in writing from the publisher, provided it is reproduced accurately, the source of the material is identified, and the NISO copyright status is acknowledged. All inquiries regarding translations into other languages or commercial reproduction or distribution should be addressed to NISO, 3600 Clipper Mill Road, Suite 302, Bethesda, MD 21211.

ISSN: 1041-5653 National Information Standards series
ISBN: 978-1-937522-62-9

Contents

Foreword	v
1 Introduction	1
1.1 Purpose	1
1.2 Scope.....	1
2 Referenced Standards	1
3 Definitions	1
4 Purpose, Location, and Authorship	2
4.1 Purpose	2
4.2 Location	2
4.3 Authorship.....	3
5 Recommendations for Specific Documents	3
5.1 Journals	3
5.2 Monographs, Books, Proceedings, and Technical Reports	3
5.3 Restricted-Access Documents	3
5.4 Patents.....	3
5.5 Standards	4
6 Types of Abstracts and Their Content	4
6.1 Informative Abstracts.....	4
6.2 Indicative Abstracts	4
6.3 Content Elements	4
6.3.1 Purpose	4
6.3.2 Methodology	4
6.3.3 Results.....	5
6.3.4 Conclusions	5
6.3.5 Collateral and Other Information	5
7 Style	5
7.1 Length.....	5
7.2 Paragraphing and Structured Abstracts	5
7.3 Complete Sentences	6
7.4 First Sentences.....	6
7.5 Use of Active Verbs	6
7.6 Terminology	6
7.7 Nontextual Materials.....	6
7.8 Treatment of Added Details.....	6
References	7

ANSI/NISO Z39.14-1997 (R2015)

Selected Readings	7
Appendix A : Examples of Abstracts	11
I. Informative Abstracts	11
II. Indicative Abstracts	14
III. Indicative-Informative Abstracts	16
IV. Abstracts of Monographs and Chapters	17
V. Less Common Types of Abstracts	18
VI. Varying the Order of Elements.....	18
VII. Position of the Bibliographic Citation for Abstracts in Access Services.....	19

Foreword

(This foreword is not part of the American National Standard *Guidelines for Abstracts*, ANSI/NISO Z39.14-1997 (R2015). It is included for information only.)

About This Standard

The growing volume of documents or texts containing information that warrants abstracting makes a well-prepared abstract increasingly important. Basic content must be quickly identifiable, both by readers of the primary literature and by users of access services (sometimes also referred to as secondary, database, or abstracting and indexing services). Authors and editors can help users to readily identify content by beginning a primary document or text with a meaningful title and a well-prepared abstract. Indeed, authors must bear in mind that many people will selectively read no more than these components of their writings.

In addition to the need for authors to write good abstracts for increasingly selective reading, it is also desirable for them to write abstracts that access services can reproduce with little or no change, copyright permitting. Always important to users of traditional access publications, abstracts have also proved to be of considerable importance to users of electronic bibliographic services such as online searching and selective dissemination of information (SDI) alerting, including systems employing full-text search. Abstracts that are well-prepared by authors ensure the accuracy of content and avoid unnecessary duplication of intellectual effort. As the quality of abstracts increases, so does the number of abstracts that can be directly employed by these access services, and thus the quality of the services for users.

This standard is the second revision of the American National Standard for Writing Abstracts, ANSI Z39.14-1971, which was prepared by Subcommittee 6 of the then American National Standards Committee on Standardization in the Field of Library Work, Documentation, and Related Publishing Practices, Z39 (now NISO). The first revision of ANSI Z39.14-1971 was issued as ANSI Z39.14-1979.

This current revision is based on several comments received in 1992 from NISO members during their review of ANSI Z39.14-1979. It incorporates helpful changes and additional examples from ISO 214-1976, the International Standard on *Abstracts for Publications and Documentation*.

The International Standard was developed between 1971 and 1975 by an ad hoc Working Group of ISO/TC 46, headed by the chairman of Z39/Subcommittee 6. It was largely based on ANSI Z39.14-1971.

It is pertinent to review briefly here how the original edition, ANSI Z39.14-1971, was prepared. Subcommittee 6 was appointed in January 1969 to complete the task of drafting a standard on writing abstracts, an assignment begun by two previous subcommittees. The new subcommittee drew heavily on the work of its predecessors and on a guide prepared by the International Union of Pure and Applied Physics, the American Institute of Physics, and UNESCO. The subcommittee members were chosen for their expertise in the writing and editing of papers, journals, and reports; the preparation of abstracts, including their computer searching; and the teaching of abstracting. Thus, members represented both discipline and mission orientations, and were involved in the communication of knowledge in such diverse fields as education, psychology, chemistry, physics, and biology.

Copies of the draft of the standard were sent to groups working on national and international standards on abstracting, to all members of the Z39 Committee, and to many individuals and groups known to be concerned with the writing of abstracts. The draft was then extensively revised to take into account the more than 50 substantive comments that were received.

In the years since this standard was first issued authors and editors in many primary publications have followed its principles. In the same period, its principles have also effected changes in the practices of major access services.

ANSI/NISO Z39.14-1997 (R2015)

The current revision committee has focused on the differences in form and content between informative and indicative abstracts; the topics of structural abstracts, electronic abstracts, information retrieval, and the content of abstracts; and on renaming the standard. Additionally, the committee has expanded the list of selected readings on the subject of abstracting and added new examples of abstracts.

This standard was processed and approved for submittal to ANSI by the National Information Standards Organization. It was balloted by the NISO Voting Members April 30, 1996 - July 31, 1996.

Reaffirmation

This standard underwent periodic reviews and was reaffirmed in 1987, 2002, 2010, and most recently in 2015. The NISO Members approved the latest reaffirmation on January 3, 2015. ANSI approved the reaffirmation on January 21, 2015.

Suggestions for improving this Standard are welcome. They should be sent to the National Information Standards Organization, 3600 Clipper Mill Road, Suite 302, Baltimore, MD 21211, telephone: 301-654-2512; email: nisohq@niso.org.

NISO Voting Members

NISO approval of this standard does not necessarily imply that all members voted for its approval. At the time it approved this standard (1997 edition), NISO had the following members:

3M

Richard W. Lindahl, Robert L. Dreger (Alt), Gerald G. Marsolek (Alt)

American Association of Law Libraries

Andrew Laurence

American Chemical Society

Robert S. Tannehill, Jr., Leon R. Blauvelt (Alt)

American Library Association

Carlen Ruschoff

American Society for Information Science

Mark H. Needleman

American Society of Indexers

Patricia S. Kuhr, Marie Kascus (Alt)

American Theological Library Association

Mvron B. Chace

Ameritech Library Services, Academic Division

John Kolman

Amoco Corporation

Randy R. Reddemann

Apple Computer, Inc.

Janet Vratney, Rita Brennan (Alt)

Armed Forces Medical Library

Diane Zehnpfennig, Beth Knapke (Alt)

Art Libraries Society of North America

Thomas E. Young, Penney DePas (Alt)

Association of Information and Dissemination Centers

Bruce H. Kiesel

Association for Information and Image Management

Judy Kilpatrick

Association of Jewish Libraries

Pearl Berger, David Gilner (Alt)

Association of Research Libraries

Duane E. Webster

Bell Labs

M. E. Brennan

CASPR, Inc.

Norman Kline, Brian Lomeli (Alt)

CARL Corporation

Ward Shaw

College Center for Library Automation

J. Richard Madaus, Ann Armbrister (Alt)

Data Research Associates, Inc.

Michael J. Mellinger, James Michael (Alt)

Data Research Users Group, Inc.

Beth F. Anderson

EBSCO Information Services

Sandra H. Hurd, Mary Beth Vanderpoorten (Alt)

Elsevier Science Incorporated

John Mancina, Norman Paskin (Alt)

The Faxon Company

Alan Nordman

Follett

D. Jeffrey Blumenthal, Michael Marchuk (Alt)

Gaylord Information Systems

James English, William Schickling (Alt)

NISO Voting Members (cont.)

GCA Research Institute

Christopher Ziener, Norman Scharpf (Alt)

Geac Computers, Inc.

Simon Kendall, B. J. Mitchell (Alt)

IBM Corporation

Tryg Ager

IEEE

Anthony Ferraro

Indiana Cooperative Library Services Authority

Millard Johnson, Janice Cox (Alt)

Information Access Company

Delores Meglio, Victoria Gray (Alt)

Innovative Interfaces, Inc.

Gerald M. Kline, Sandra Westall (Alt)

Knight-Ridder Information, Inc.

Richard Boulderstone, David Loy (Alt)

Lexis-Nexis

Peter Ryall

Library Binding Institute

Sally Grauer

Library of Congress

Winston Tabb, Sally H. McCallum (Alt)

Medical Library Association

Katherine Hughes, Carla J. Funk (Alt)

MINITEX

Anita Anker Branin, William DeJohn (Alt)

Music Library Association

Lenore Coral, Geraldine Ostrove (Alt)

National Agricultural Library

Pamela Q. J. Andre, Gerry K. McCone (Alt)

National Archives and Records Administration

Alan Calmes

National Federation of Abstracting and Information Services

John Schnepf

National Library of Medicine

Lois Ann Colilianni

OCLC, Inc.

Donald J. Muccino

OHIONET

Michael P. Butler, Greg Pronevitz (Alt)

OhioLINK

David Barber

PALINET

James E. Rush

Readmore Academic Services

Sandra J. Gurshman, Amira Aaron (Alt)

The Research Libraries Group, Inc.

Wayne Davison, Kathy Bales (Alt)

R. R. Bowker

Emery Koltay

R. R. Donnelley & Son, Co.

Sidney P. Marland III

SilverPlatter Information, Inc.

Peter Ciuffetti, Barbara Bishop (Alt)

SIRS, Inc.

Leonardo Lazo, Harry Kaplanian (Alt)

Society of American Archivists

Lynn Lady Bellardo

Society for Technical Communication

Connie Bibus, Kevin Burns (Alt)

Special Libraries Association

Marjorie Hlava

SUNY /OCLC

Liz Lane

UMI

Blake Ratcliffe, Jim Tumolo (Alt)

U.S. Department of the Army, Headquarters

Paula E. Vincent

U.S. Department of Commerce, National Institute of Standards and Technology, Office of Information Services

Paul Vassallo, Jeff Harrison (Alt)

U.S. Department of Defense, Defense Technical Information Center

Gretchen A Schlag, Claire Tozier (Alt)

U.S. Department of Energy, Office of Scientific and Technical Information

Mary Hall, Nancy Hardin (Alt)

U.S. National Commission on Libraries and Information Science

Peter R. Young

VTLS, Inc.

Vinod Chachra

West Publishing Company

Andy Desmond, Forrest Rhoads (Alt)

Winnebago Software

Bob Engen, Carol E. Blagwedt (Alt)

The H.W. Wilson Company

George I. Lewicky, Ann Case (Alt)

ANSI/NISO Z39.14-1997 (R2015)

At the time this standard was approved by NISO for reaffirmation in 2015, the following were members of the ANSI/NISO Z39.14-1997 (R201x) Review Voting Pool:

American Library Association
Nancy Kraft

American Psychological Association
Janice Fleming

American Society for Information Science & Technology (ASIS&T)
Mark Needleman

American Society of Civil Engineers (ASCE)
Bruce Gossett

Cengage Learning
Marti Heyman

EBSCO Information Services
Oliver Pesch

Ex Libris, Inc.
Mike Dicus

IEEE
Adam Philippidis

John Wiley & Sons, Ltd.
Duncan Campbell

Library of Congress
John Zagas

Mulberry Technologies, Inc.
Tommie B. Usdin

Music Library Association
Nara Newcomer

National Federation of Advanced Information Services (NFAIS)
Marjorie Hlava

National Library of Medicine (NLM)
Barbara Rapp

Public Library of Science (PLOS)
Cameron Neylon

Society for Technical Communication (STC)
Annette Reilly

NISO Board of Directors

At the time NISO approved this standard (1997), the following individuals served on its Board of Directors:

Michael J. McGill, Chair

University of Michigan Medical Center

Joel H. Bazon, Vice Chair/Chair-elect

Dawson Holdings PLC

Michael Mellinger, Immediate Past Chair

Data Research Associates, Inc.

Patricia R. Harris, Executive Director

National Information Standards Organization

Directors Representing Libraries

Nolan Pope

University of Wisconsin-Madison

Clifford Lynch

University of California

Lenny Stovel

Research Libraries Group, Inc.

Directors Representing Information Services

Howard Turtle

West Publishing Company

John Kolman

Ameritech Library Services, Academic Division

Vinod Chachra

VTLS, Inc.

Directors Representing Publishing

Marjorie Hlava

Access Innovations, Inc

Robert C Badger

Springer Verlag NY, Inc.

Elizabeth Bole Eddison

Inmagic, Inc

Standards Committee AG

Standards Committee AG on Guidelines for Abstracts had the following members at the time this standard was approved in 1997:

Edward T. Cremmins, Chair

Timothy Craven

Graduate School of Library and Information Science, The University of Western Ontario

Eileen Dolan

John Wiley & Sons

Billris Jakim

American Institute of Aeronautics & Astronautics

Roger L. Moody

Chemical Abstracts Service

Adam Philippidis

IEEE

Michael Rinehart

BHA / Bibliography of the History of Art, Getty Art History Information Program

Trademarks, Services Marks

Wherever used in this standard, all terms that are trademarks or service marks are and remain the property of their respective owners.

Guidelines for Abstracts

1 Introduction

In this standard, the term *abstract* signifies a brief, objective representation of the contents of a primary document or an oral presentation. The term *abstract* should not be confused with the related but distinct terms: *annotation*, *extract*, *summary*, and *synoptic* (see Section 3, Definitions).

Superscript numbers are keyed to the references listed in the Bibliography.

1.1 Purpose

This standard is intended to guide authors and the staffs of access services in preparing abstracts of maximum usefulness.

1.2 Scope

The recommendations of this standard apply to all abstracts whether written by the author(s) of a document or by anyone else, and whether they accompany the document, appear in access publications or services, or as separately published representations of formal oral presentations.

2 Referenced Standards

This standard is intended to be used in conjunction with the following standards. When these standards are superseded by revisions, the revisions shall apply.

ANSI Z39.5-1985, *Abbreviation of Titles and Publications*

[Note: Withdrawn; refer to ISO 4:1997, *Information and documentation – Rules for the abbreviation of title words and titles of publications*]

ANSI/NISO Z39.18-1995, *Scientific and Technical Reports—Elements, Organization, and Design*

[Note: Superseded by ANSI/NISO Z39.18-2005 (R2010), *Scientific and Technical Reports - Preparation, Presentation, and Preservation*]

3 Definitions

Abstract – A brief and objective representation of a **document** or an oral presentation.

Access publication or service – A print- or computer-based collection of **abstracts** and bibliographic references that serve as alerting or retrospective access keys, or both, to original documents.

Annotation – Brief explanation of a **document** or its contents, usually added as a note to clarify a title.

Controlled vocabulary – A list of **terms** that may be used for indexing.

Critical abstract – Uncommon form of **abstract** that contains evaluative comments on the significance of the material abstracted or the style of its presentation. The comments are written by abstractors who are usually subject-area specialists. See Example V-A in the Appendix.

ANSI/NISO Z39.14-1997 (R2015)

Descriptor – A **term** chosen as the preferred representation for a concept or feature in an index.¹

Document – An item, printed or otherwise, that is amenable to abstracting; applicable not only to written and printed materials in paper or microform versions (e.g., books, journals, maps, diagrams), but also to nonprint media (e.g., machine-readable records, transparencies, audiotapes, videotapes) and, by extension, to three-dimensional objects or realia (e.g., museum objects and specimens).²

Electronic abstract – One that is contained in an electronic publication.

Extract – One or more portions of a **document** selected to represent the whole.

Free-text search – Information retrieval search using natural-language **terms** appearing in **documents** or their descriptions.¹

Identifier – A proper name (or its abbreviation) of a person, institution, place, object, operation or process, optionally treated as a type of **term** distinct from **descriptor**.¹

Keyword – A word occurring in the natural language of a **document** or its surrogate that is considered significant for indexing and retrieval.

Slanted abstract – One designed to represent a particular portion of, or a particular perspective on, a **document** for the benefit of a specialized audience. See Example V-B in the Appendix.

Structured abstract – An **abstract** that is arranged according to prescribed headings. See Example I-I in the Appendix.

Summary – A brief restatement within a **document** (usually at the end) of its salient findings and conclusions intended to complete the orientation of a reader who has studied the preceding text.

Synoptic – A concise original publication of key results selected from an available but previously unpublished paper. It differs from an **abstract** (which it may contain) in that it is usually longer.

Term – A word or phrase used to represent a topic or feature of a documentary unit in an index.¹

4 Purpose, Location, and Authorship

The purpose, location, and authorship of abstracts are three aspects of preparation that enhance an abstract's usefulness.

4.1 Purpose

A well-prepared abstract enables readers (a) to identify the basic content of a document quickly, (b) to determine its relevance to their interests, and thus (c) to decide whether they need to read the document in its entirety. The abstract may facilitate a closer reading of the primary document by providing an introductory overview of its topic or argument, or, for readers to whom the document is of marginal interest, the abstract may provide enough information to make a reading of the full document unnecessary. Abstracts also may render the primary content of a document in another language accessible in the language of the abstract.

An abstract also facilitates free-text searching in an electronic environment and supports the application of controlled indexing vocabularies in access services. Since abstracts originally intended to accompany a primary publication may also be used by access services, these objectives should be considered from the outset.

4.2 Location

In a journal an abstract should be placed on the first page of each abstracted item between the title and the beginning of the text. In a separately published document the abstract should be placed

between the title page and the text. Abstracts of separate chapters should appear under each chapter title on the first page of its text.

In access publications and databases, or whenever an abstract is reproduced separately from the document to which it refers, it should be accompanied by a full bibliographic reference for the original document.

In electronic formats the abstract should constitute a defined and searchable field accompanied by fields indicating (a) the bibliographic description of the primary document, (b) the author or source of the abstract, and, optionally, (c) the language of the abstract.

4.3 Authorship

When an abstract is used by an access service, its authorship may be unattributed or indicated, normally following the abstract, in one of the following ways:

- Author
- Author (edited)
- Author (revised)
- Name of the access service or other source providing the abstract
- Name or initials of the abstractor

5 Recommendations for Specific Documents

The following recommendations for abstracts are intended to guide authors and editors of specific documents and publications, whether printed or electronic. This list is not exhaustive; however, it covers many commonly encountered document types, including journals, reports, monographs, books, proceedings, patents, and standards.

5.1 Journals

Irrespective of publication media, an abstract should be included with every journal article or synoptic, essay, and discussion. When resources permit it, access services should also provide brief abstracts for substantive notes, reviews, editorials, and letters to the editor.

5.2 Monographs, Books, Proceedings, and Technical Reports

A single comprehensive abstract should be included in every monograph, book, or proceedings. This may be sufficient if the volume deals with a homogeneous subject, but separate abstracts are also necessary for each chapter or section if the volume covers different topics or is a collection of articles by different authors, for example, the proceedings of a meeting or symposium (see Example IV-B in the appended examples of abstracts). An abstract should also be included in all technical reports.

5.3 Restricted-Access Documents

For a restricted-access document, for example, a report that has been given a government security classification, it is highly desirable to provide a non-restricted-access abstract.

5.4 Patents

An abstract of the disclosure should be included in every United States patent, prepared in accordance with guidelines established by the United States Patent and Trademark Office.³

5.5 Standards

An abstract should be included as part of each standard, whether international, regional, national, or industrial. The abstract should contain information on the object and field of application of the standard.

6 Types of Abstracts and Their Content

Abstracts are generally described as either informative or indicative, reflecting the mode or perspective in which they are written. In the informative mode, the original document is condensed, reflecting its tone and content. An abstract written in the indicative mode describes rather than paraphrases the original document and its contents. The mode employed in a particular situation depends on the purpose of the abstract. Both types of abstracts should present as much as possible of the essential information contained in the text.

6.1 Informative Abstracts

Informative abstracts are generally used for documents pertaining to experimental investigations, inquiries, or surveys. These abstracts state the purpose, methodology, results, and conclusions presented in the original document. While most abstracts describing experimental work can be constructed in this sequence, the optimum sequence may depend on the audience for whom the abstract is primarily intended. For example, a results-oriented arrangement, in which the most important results and conclusions are placed first, may be useful to some audiences.

6.2 Indicative Abstracts

Indicative abstracts are best used for less-structured documents, such as editorials, essays, opinions or descriptions; or for lengthy documents, such as books, conference proceedings, directories, bibliographies, lists, and annual reports. Indicative abstracts are usually written for documents that do not contain information relating to methodology or results. The abstract should, however, describe the purpose or scope of the discussion or descriptions in the document. Also, it may describe essential background material, the approaches used, and/or arguments presented in the text.

In practice, original documents may contain elements that necessitate an abstract that combines the indicative and informative approaches. For example, a largely descriptive paper may contain an informative conclusion (see Example III-A in the appended examples of abstracts).

6.3 Content Elements

A complete abstract contains specific elements.

6.3.1 Purpose

State in the abstract the primary objectives and scope of the study or the reasons the document was written. Because abstracts are often expected to be read in conjunction with the title, avoid the use of statements that are, or closely resemble, verbatim versions of the title. Refer to earlier research literature only if doing so is essential in order to clarify the purpose of the document.

6.3.2 Methodology

Describe techniques or approaches only to the degree necessary for comprehension. Report new techniques or applications when emphasized in the original document.

6.3.3 Results

Describe results as concisely and informatively as possible. They may be experimental or theoretical results obtained, data collected, relationships and correlations noted, effects observed, etc. When results are too numerous for all of them to be included, those pertaining to new and verified events or that contradict previous theories should receive priority.

6.3.4 Conclusions

Describe the implications of the results, especially how they relate to the purpose of the investigation or the reason for preparing the document. Conclusions can be associated with recommendations, evaluations, applications, suggestions, new relationships, and hypotheses accepted or rejected.

6.3.5 Collateral and Other Information

Findings or information incidental to the main purpose of the document but of value outside its major subject area may be included. Report these clearly but in such a way that they do not distract from the main theme. Do not exaggerate in the abstract their relative importance in the source document.

Cite background information from the document sparingly if at all. Do not include information or claims not contained in the document itself.

Access services may choose to include further details about the document, such as the presence of extensive tables, illustrations, indexes, and the number of bibliographic references.

7 Style

An abstract must be intelligible to a reader without reference to the document it represents. For clarity, avoid using footnotes, lists of references, or references to the text of the original document. Retain the balance and emphasis of the original documents, except in a slanted abstract. Be concise, fulfill content requirements, but do not be cryptic or obscure. For coherence, use transitional words and phrases.

7.1 Length

The length of an abstract differs according to the type of document being abstracted and the ways the abstract is to be used. If length is not specified the following lengths are usually adequate:

Document	Maximum Length of Abstract
papers, articles, portions of monographs	250 words
notes, short communications	100 words
editorials, letters to the editor	30 words
long documents such as monographs and theses	single page, 300 words

To avoid biasing retrieval results, an abstract's length and the number of keywords appearing in it should be appropriate to the potential usefulness of the document abstracted.

7.2 Paragraphing and Structured Abstracts

Generally, write the abstract as a single paragraph. In structured abstracts, however, the major points of the text are presented in several labeled paragraphs rather than a single one (see Example I-I in the appended examples of abstracts).

7.3 Complete Sentences

Generally, use complete sentences. Where incomplete sentences are used, they should be clear and coherent, for example:

Survey of efforts of Renaissance architects to interpret Vitruvius's description of the ancient Roman house. [Deleted verb.]

Examines the ideological relations of the Holy Sepulchre, as manifested in writings, ceremonies, and architecture. [Deleted subject.]

See also Examples II-H and II-I in the appended examples of abstracts.

7.4 First Sentences

In the first sentence of an abstract, avoid naming the type of document (e.g., "This article evaluates," "This essay examines," or "This study presents") when this information may be inferred from the title, bibliographic reference, or the text of the full abstract.

7.5 Use of Active Verbs

Use verbs in the active voice whenever possible. However, the passive voice may be used for indicative statements and even for informative statements in which the receiver of the action should be emphasized. For example:

Say: "Iron-containing bauxites sweeten gasolines in the presence of air."

Not: "Gasolines are sweetened by iron-containing bauxites in the presence of air."

But: "The relative adsorption coefficients of ether, water, and acetylene were measured by...."

7.6 Terminology

Avoid unfamiliar terms, acronyms, abbreviations, and symbols, or define them the first time they occur in an abstract. Within access services and as an aid to electronic searching, include terms that complement any descriptors or identifiers that may be assigned to the document. Words or phrases used as descriptors or identifiers may also be included in the abstract.

For the purposes of electronic retrieval, abstracts should have terminology that (a) expresses terms both in their abbreviated form and in their spelled-out form (it is common to present the fully spelled-out form on the first use of the term), (b) does not use negatives (e.g., "unhealthy" or "sick" rather than "nonhealthy"), and (c) places words directly adjacent to other words to represent concepts (e.g., "middle class and working class" rather than "middle and working class").

7.7 Nontextual Materials

Include short tables, equations, structural formulas, and diagrams only when they are necessary for brevity and clarity and when no acceptable alternative exists.

7.8 Treatment of Added Details

Access services that choose to include further details about the document itself (see Section 6.3.5) should place them either at the end of the abstract or as parts of the bibliographic reference. These details need not be in sentence form (for example, "15 references").

References

1. NISO TR-02-1997, *Guidelines for Indexes and Related Information Retrieval Devices*. Bethesda: NISO Press, 1997.
2. ANSI/NISO Z39.19-2005 (R2010), *Guidelines for the Construction, Format, and Management of Monolingual Controlled Vocabularies*. Baltimore, MD: NISO, 2010.
3. Wahl, R. A. Patent abstracts. In *Official Gazette of the United States Patent and Trademark Office*. 862(3): 653-54; 1969. [Updated periodically in issues of the *Official Gazette*, and in *Manual of Patent Examining Procedure*, Section 708.01(b). Available from Superintendent of Documents, Washington, DC 20402.]

Selected Readings

Monographs

- Borko, H. and C.L. Bernier. *Abstracting Concepts and Methods*. New York: Academic Press, 1975.
- Cleveland, D.B. and A.D. Cleveland. *Introduction to Indexing and Abstracting*. 2nd Edition. Englewood, CO: Libraries Unlimited, 1990.
- Collison, R.L. *Abstracts and Abstracting Services*. Santa Barbara, CA: A.B.C.-Clio, Inc., 1971.
- Cremmins, E.T. *The Art of Abstracting*. 2nd Edition. Arlington, VA: Information Resources Press, 1994.
- Lancaster, F.W. *Indexing and Abstracting in Theory and Practice*. Champaign, IL: Graduate School of Library and Information Science, 1991.
- Maizell, R.E., J.F. Smith, and T.E.R. Singer. *Abstracting Scientific and Technical Literature*. New York: Wiley-Interscience, 1971.
- O'Connor, B.C. *Explorations in Indexing and Abstracting: Pointing, Virtue, and Power*. Englewood, CO: Libraries Unlimited, 1996.
- Rowley, J.E. *Abstracting and Indexing*. 2nd Edition. London: Clive Bingley Limited, 1988.
- Tibbo, H. R. *Abstracting, Information Retrieval and the Humanities: Providing Access to Historical Literature*. Chicago: American Library Association, 1993.

Quality

- Ashworth, W. Abstracting as a fine art. *Information Scientist*, 7(2): 43-53, 1973.
- Hartley, J. Improving journal abstracts (current research in technical communication). *Technical Communication*, 42(2): 333-334, 1995.
- Haynes, R.B. More informative abstracts: current status and evaluation. *Journal of Clinical Epidemiologist*, 46(7): 595-597, 1993.
- King, R.A. A comparison of the readability of abstracts with their source documents. *Journal of the American Society for Information Science*, 27(2): 118-121, 1976.
- Kowitz, G.T., et al. From ERIC source documents to abstracts: A problem in readability. Presented at the Rocky Mountain Education Research Association, Tucson, AZ, November 29, 1973, ED0086243.
- Tenopir, C. and P. Jacso. Quality of abstracts. *ONLINE*, 17(3): 44-55, 1993.

Guidelines

- Borko, H. and S. Chatman. Criteria for acceptable abstracts: A survey of abstractors' instructions. *American Documentation*, 14(2): 149-160, 1963.

ANSI/NISO Z39.14-1997 (R2015)

Cortelyou, E. The abstract of the technical report. *Journal of Chemical Documentation*, 32(10):532-33, 1955.

Haynes, R.B., C. D. Mulrow, E.J. Heath, D.G. Altman, and M.J. Gardner. More informative abstracts revisited. *Annals of Internal Medicine*, 113(1): 69-76, 1990.

Hayward, R.S., M.C. Wilson, S.R. Tunis, E.B. Bass, H.R. Rubin, and R.B. Haynes. More informative abstracts of articles describing clinical practice guidelines. *Annals of Internal Medicine*, 118(9): 731-737, 1993.

Tibor, K. A hypertext tutorial on abstracting for library science students. *Journal of Education for Library and Information Science*, 36:170-173, 1995.

McGirr, C.J. Guidelines for Abstracting. *Technical Communications*, Second Quarter, 2-5, 1978.

Weil, B.H., I. Zarembor, and H. Owen. Technical-abstracting Fundamentals. II. Writing principles and practices. *Journal of Chemical Documentation*, 3(2): 125-132, 1963.

Cognitive Processes

Endres-Niggemeyer, B. A procedural model of an abstractor at work. *International Forum on Information and Documentation*, 15: 3-15, 1990.

Molina, M.P. Documentary abstracting: Toward a methodological model. *Journal of the American Society for Information Science*, 46(3): 225-234, 1995.

Structure of and Content in Abstracts

Arndt, K.A. The informative abstract. *Archives of Dermatology*, 128 (1): 101, 1992.

Broer, J.W. Abstracts in block diagram form. *IEEE Transactions on Engineering Writing and Speech*, 14(3): 64-67, 1971.

Herner, S. Subject slanting in scientific abstracting publications. In: *International Conference on Scientific Information, Washington, D.C., Proceedings*, Vol. 1. Washington, DC: National Academy of Science-National Research Council, pp. 407-427, 1959.

Lancaster, F.W. and S. Herner. Modular content analysis. *Proceedings of the Annual Meeting of the American Documentation Institute*, 1: 403-405, 1964.

Liddy, E.D. Discourse-level structure in abstracts. *Proceedings of the Annual Meeting of the American Society for Information Science*, 24: 138-147, 1987.

_____. The discourse-level structure of empirical abstracts: An exploratory study. *Information Processing and Management*, 27(1): 57-81, 1991.

Manning, A.D. Abstracts in relation to larger and smaller discourse structures. *Journal of Technical Writing and Communication*, 20(4): 369-387, 1990.

Rennie, D., and R. M. Glass. Structuring abstracts to make them more informative. *Journal of the American Medical Association*, 266(1): 116-117, 1991.

Salager-Meyer, F. Discoursal flaws in medical English abstracts: A genre analysis per research and text-type. *Text*, 10(4): 365-384, 1990.

_____. Medical English abstracts: How well are they structured? *Journal of the American Society for Information Science*, 42(7): 528-531, 1991.

Trawinski, B. A methodology for writing problem structured abstracts. *Information Processing and Management*, 25(6): 693-702, 1989.

Vaughn, O.K. Abstracts and summaries: some clarifying distinctions. *The Technical Writing Teacher*, 18(2): 132-141, 1991.

Standards

Tibbo, H.R. Abstracting across the disciplines: A content analysis of abstracts from the natural sciences, the social sciences, and the humanities with implications for abstracting standards and online information retrieval. *LISR*, 14(1): 31-56, 1992.

Weil, B.H. Standards for writing abstracts. *Journal of the American Society for Information Science*, 21(5): 351-358, 1970.

Information Retrieval

Fidel, R. The possible effect of abstracting guidelines on retrieval performance of free-text searching. *Information Processing and Management*, 22(4): 309-316, 1986.

_____. Writing abstracts for free-text searching. *Journal of Documentation*, 43(1):11-21, 1988.

Tibbo, H.R. [See under Standards, above.]

Glossary

Wellisch, H.H. *Abstracting, Indexing, Classification, Thesaurus Construction: A Glossary*. Port Aransas, TX: American Society of Indexers, 1996.

Appendix A: Examples of Abstracts

(This foreword is not part of the American National Standard *Guidelines for Abstracts*, ANSI/NISO Z39.14-1997 (R2015). It is included for information only.)

The format of these examples is generally similar to the format used in many access publications: the bibliographic citation appears before the text of the abstract. Alternative orders are illustrated in Section VI. The abstracts are shown as published with the exception that, when appropriate, first or second sentences were edited slightly to conform to the style guidelines in Section 7.4 of this standard.

I. Informative Abstracts

Example A.

Harm, Deborah L.; Zografos, Linda M.; Skinner, Noel C. Changes in compensatory eye movements associated with simulated stimulus conditions of spaceflight. *Aviation, Space, and Environmental Medicine* 64(9): 820-26; 1993.

Compensatory vertical eye movement gain (CVEMG) was recorded during pitch oscillation in darkness before, during, and immediately after exposures to the stimulus rearrangement produced by the Preflight Adaptation Trainer (PAT) Tilt-Translation Device (TTD). The TTD is designed to elicit adaptive responses that are similar to those observed in microgravity-adapted astronauts. The data from Experiment 1 yielded a statistically significant CVEMG decrease following 15 min of exposure to a stimulus rearrangement condition where the phase angle between subject pitch tilt and visual scene translation was 270 deg; statistically significant gain decreases were not observed following exposures either to a condition where the phase angle between subject pitch and scene translation was 90 deg or to a no-stimulus-rearrangement condition. Experiment 2 replicated the 270-deg-phase condition from Experiment 1 and extended the exposure duration from 30 to 45 min. Statistically significant additional changes in CVEMG associated with the increased exposure duration were not observed. The adaptation time constant estimated from the combined data from Experiments 1 and 2 was 29 min.

Example B.

Fliegel, Frederick C. *The low-income farmer in a changing society*. University Park, PA: Pennsylvania State University, Agriculture Experiment Station; 1966; Bulletin 731. 39p.

To identify some major differences among low-income farmers, and to delineate the group that represents the real core of the persistently poor, data were obtained from 189 farm operators representing a stratified random sample in Fayette County, Pennsylvania, in 1957. The five main categories of individuals identified were: (1) the aged, (2) the physically handicapped, (3) the farm operator primarily oriented to non-farm opportunities, (4) the farm operator oriented to commercial agriculture, and (5) the farm operator oriented to subsistence agriculture. The characteristics of the core of low-income subsistence farmers who normally do not respond to either welfare or economic-development efforts were examined in greater detail. It was found that they: (1) retained traditional values while having lost many traditional subsistence skills, (2) failed to respond to greater agricultural efficiency and productivity efforts because commercial success was not highly valued, (3) placed extreme emphasis on neighborliness and friendliness as their primary goals, and (4) must respond to an attempt to change prestige orientation if their cycle of poverty is to be broken.

ANSI/NISO Z39.14-1997 (R2015)

Example C.

Baresel, D. [and others]. Tungsten carbide as anode material for fuel cells. *Angewandte Chemie International Edition in English*. 10(3): 194-95; 1971.

Stationary potentiostatic current-voltage curves for tungsten carbide and Raney platinum electrodes of equal size in the electrochemical oxidation of 6 M formaldehyde in 3 M sulphuric acid at 70°C showed that tungsten carbide was superior in the potential range of interest for fuel cell anodes. Current densities after 3h were 650 mA/g of tungsten carbide using formaldehyde, 500 mA/g using hydrogen, and 160 mA/g using formic acid. Graph.

Example D.

Takahasi, Taro; Mao, Ho Kwang; Bassett, W. A. Lead: X-ray diffraction study of a high-pressure polymorph. *Science*. 165(3900): 1352-53; 1969.

An X-ray diffraction study of lead under pressure has shown that the face-centered cubic structure transforms to the hexagonal close-packed structure at room temperature and a pressure of 130 ± 10 kbar. The volume change for the transformation is -0.18 ± 0.06 cm³/mol.

Example E.

McCluskey, James J.; Parish, Thomas S. A comparative study of cognitive skills in learning hypercard by right-brain dominant, left-brain dominant, and mixed-brain dominant students. *Education*. 113(4): 553-55; 1994.

In the present study 24 undergraduate students were found to be left-brain dominant (N=15), right-brain dominant (N=3), or mixed-brain dominant (N=6). Subsequently, these students were taught how to design/develop HyperCard stacks. The findings generally supported the notion that right-brain dominant individuals outperformed their left-brain and mixed-brain dominant counterparts. Future studies are encouraged to survey greater numbers of subjects in order to reduce some statistical limitations imposed on the present study from surveying a small number of students.

Example F.

McManus, I. C.; Cheema, B.; Stoker, J. The aesthetics of composition: a study of Mondrian. *Empirical Studies of the Arts*. 11(2): 83-94; 1993.

Subjects carried out a paired comparison experiment in which they were asked to make a preference judgement between a computer facsimile of an original Mondrian painting, and a modified version of the same picture in which the proportional relations of the compositional lines had been modified by a relatively small amount. Subjects were significantly better than chance expectations in their preference for the original Mondrians, suggesting that these paintings may encapsulate some universal principle of compositional order which can be detected by subjects.

Example G.

Veteto, Stephen George. A linguistic analysis of selected sayings of Jesus as representative of an independent source of the Gospels. Mid-America Baptist Theological Seminary; 1993. 232p. Dissertation.

The source critical issue regarding the legitimacy of the hypothetical Q document is examined. A debate among scholars in recent years has centered around the sources behind the Synoptic Gospels and, in particular, whether a Q document is needed to solve the source question.

The focus of this work is to utilize two distinct aspects of linguistics (literary patterns, such as chiasmus and inclusio, and discourse analysis) and apply them to the study of the source issue. Selected passages in Matthew, Luke, and Q are investigated, then analyzed against established criteria to formulate a conclusion regarding the viability of a literary document labelled Q.

Significant data uncovered in this dissertation includes: (1) Matthew and Luke utilize chiasmus on a regular basis, while the Q passages contain very few; (2) Matthew employs inclusio frequently while Luke and Q do not employ this rhetorical device as regularly; (3) The opening words of Q's pericopae do not agree in the parallel passages, but frequently agree within each pericope; (4) Matthew, Luke,

and Q exhibit semantic and thematic unity in sections larger than individual pericope; (5) Matthew and Luke indicate peaking within discourses and pericopae in a more extensive fashion than Q, but Q does utilize peaking.

Conclusions established from the data regarding the viability of Q being a written document were not consistent. Chiastic structures are not present in Q and discredit the literary unity of Q. Data concerning inclusio, questions, and the use of conjunctions was inconclusive, while semantic and thematic links and discourse analyses support the existence of a written Q document. This work did not produce an unequivocal argument for or against Q existence.

Example H. Informative abstract for an overview document.

Seiler, J. A. Diagnosing interdepartmental conflict. *Harvard Business Review*. 41(5): 121-32; 1963.

Resolution of interdepartmental conflicts that decrease productivity may require structural reorganization to reduce authority-prestige ambiguity and internal social instability, or may require intergroup training and counseling to reduce point-of-view conflicts, or both. A thorough study is needed of the goals and environment of the organization as a whole. Experience (cited in numerous case histories) has demonstrated that three conditions must be established to reduce these interdepartmental conflicts. Each group must have internal social stability, including common interests and promotion opportunities. Groups in close contact must share external values through common training and point of view. Authority, as indicated by work flow and control, must follow prestige lines to be legitimate.

Example I. Structured abstract.

Rask, Kimberly J [and others]. Obstacles predicting lack of a regular provider and delays in seeking care for patients at an urban public hospital. *Journal of the American Medical Association*. 271(24): 1931-33; 1994.

Objective: To determine the correlation among obstacles to medical care, lack of a regular source of care, and delays in seeking care.

Design: Cross-sectional survey of patients presenting for ambulatory care during a 7-day period. Multiple logistic regression models were used to identify obstacles independently associated with outcome variables.

Setting: Urban public hospital.

Patients: A total of 3897 disadvantaged and predominantly minority patients.

Main Outcome Measures: Lack of a regular source of medical care and delay in seeking medical care for a new problem.

Results: The majority (61.6%) of patients reported no regular source of care. Of 2341 patients reporting a new medical problem, 48.4% waited more than 2 days before seeking medical care. No health insurance (adjusted odds ratio [OR], 2.2; 95% confidence interval [CI], 1.89 to 2.61), no transportation (OR, 1.44; 95% CI, 1.23 to 1.70), exposure to violence (OR, 1.21; 95% CI, 1.08 to 1.45), and living in a supervised setting (OR, 1.50; 95% CI, 1.00 to 2.25) were independent predictors of lack of a regular source of care. No insurance (OR, 1.24; 95% CI, 1.02 to 1.51), no transportation (OR, 1.45; 95% CI, 1.19 to 1.77), and less than a high school education (OR, 1.22; 95% CI, 1.08 to 1.49) were independent predictors of delaying care for a new medical problem.

Conclusions: Obstacles in addition to lack of insurance impede provision of medical care to disadvantaged patients. The adoption of universal health care coverage alone will not guarantee access to appropriate medical care.

II. Indicative Abstracts

Example A.

Southworth, Michael. Theory and practice of contemporary urban design. *Town Planning*. 60(4): 369-402; 1989.

The field of urban design in the United States, and how it is changing were evaluated, primarily through study of urban design plans. The research examines the goals, environmental quality concerns, analytical content, analytical methods, degree and type of public involvement, implementation techniques, theoretical foundations, and impacts of 70 urban design plans for 40 towns and cities in the United States prepared between 1972 and 1989. Comparisons are made with similar plans prepared between 1960 and 1972. Recommendations are made for education and professional practice.

Example B.

Leira, Bernt J. Multivariate distributions of maxima and extremes for Gaussian vector-processes. *Structural Safety*. 14: 247-65; 1994.

A new class of multivariate extensions of probability distributions related to local maxima and extremes for scalar Gaussian processes are considered. Joint statistics of the radius vector magnitude and the corresponding direction vector constitute the basis for the present approach. The asymptotic behavior of the distributions is also investigated. The influence from basic process characteristics on the shape of the density functions are studied. Application of the extreme value distributions for evaluation of reliability is discussed. Numerical results are presented for a specific example. Finally, the relevance of the so-called expected extreme hypersurfaces is illustrated in connection with a given design formulation.

Example C.

Grossman, G. Dust transport in transmission and distribution lines. *Schiff Hafen*. 22: 736; 1970 August.

The effect of pressure on the transport velocity of dust in gas pipelines is considered, including such factors of the total process as the effect of weight and friction forces on the dust particle; speed limit of particle fall as a function of its diameter and the characteristics of the gas stream; thickness of the laminar layer on "dunes" formed on the pipe bottom; and speed of gas in this layer. Correlations developed were verified experimentally.

Example D.

Black, S. Organization of small laboratory. 1968. Fall meeting paper of the Society for Experimental Stress Analysis. San Francisco, CA. 14p.

The day-to-day operation of a small mechanical-testing laboratory engaged primarily in experimental stress analysis is discussed. Emphasis is placed on the training of personnel, availability of modular test equipment and facilities, and the systematic organization of materials and procedures.

Example E.

Van der Elst, M. Dutch equipment for the chemical process industry. *Chim. Ind. (Milan)*. 53(5): 526-27; 1971.

The manufacture in the Netherlands of equipment for the petrochemical and chemical process industries is discussed. Topics covered are heat exchangers, evaporators, heaters, distillation apparatus, pumps, compressors, furnaces, pressure vessels, and gas tanks.

Example F.

Hayashi, T. Residual reduction and desulphurization by I.F.P Hydro Treatment. *Sekiyu Gakkai Shi*. 14(3): 195-97; 1971.

The main features are discussed of the pretreatment designed to improve the product quality and catalyst life in the Institut Francais du Pétrole hydrodesulphurization process.

Example G.

Yates, Stanley. The baroque guitar: Late Spanish style as represented by Santiago de Murcia in the "Saldivar Manuscript" (1752), with three recitals of selected works by Bach, Rak, Brouwer, Hummel, Gnattali and others. University of North Texas; 1993. 192p. Dissertation.

The late Spanish baroque guitar style is studied as represented in the *Saldivar Manuscript*, the recently rediscovered companion volume to Santiago de Murcia's five-course guitar tablature *Passacalles y obras de guitarra of 1732*.

The musical content of the manuscript is discussed according to the chronology and origin of the *diferencia* ground plans (which include genres imported from France, Italy and the New World as well as Spanish popular songs and dances), their harmonic, melodic and metric characteristics, and the resulting confluence of galant and national style.

The major portion of the study is given over to an analysis of Murcia's guitar style. This includes detailed discussions of *rasquado* and *punteado* variation technique, the technical and musical (phraseological and articulative) implications of his fingerings for the left hand, *campanela* technique, national and mixed ornamental styles, and tuning.

Example H.

Ousterhout, Robert. The temple, the sepulchre, and the martyrion of the Savior. *Gesta*. 29(1): 44-53; 1990.

Examines the ideological relationship of the Holy Sepulchre and the Temple of Jerusalem, as manifest in writings, ceremonies and architecture. A possible relationship between the form of the Tomb aedicula at the Holy Sepulchre and early representations of the Ark of the Covenant is explored. Related to this, the origin and significance of the term martyrion in reference to the site of the Holy Sepulchre is discussed. Concludes with comments on the interpretation of the symbolic language of architecture.

Example I.

Pellecchia, Linda. Architects read Vitruvius: Renaissance interpretations of the atrium of the ancient house. *Journal of the Society of Architectural Historians*. 51(4): 377; 1992.

Survey of efforts of Renaissance architects, humanists, and translators to interpret Vitruvius's description of the ancient Roman house, particularly the form and function of the atrium. Notes their reliance on written sources in the absence of archaeological evidence; examines definitions of the word atrium by Flavio Biondo and others; and focuses on the various interpretations of Alberti, Francesco di Giorgio, Fra Giocondo, Calvo and Raphael, Cesariano, and Daniele Barbaro and Palladio.

III. Indicative-Informative Abstracts

Example A.

Douglas, K. Sv. The impact of developments in shipping technology on shipping operational costs. *Sjoefarts Tidning*. 66: 22; 1970 July.

The modern shipbuilders must anticipate future needs for marine transportation, specialize as to type of ship and size, and develop the required product on the soundest possible commercial basis. Low capital cost is important, but the builder's share of total cost is relatively small, and economies in shipbuilding therefore have limited effect on overall costs. Efficient design for both technical performance and low maintenance costs is of great importance, with the following items especially deserving of attention: ship form; propeller design; main propulsion units; bulbous bow; automation; cargo handling; paint systems and corrosion control; maintenance; and the modeling of engine-room systems. Mathematical methods are necessary for determining whether increased costs for innovations will be justified by operational savings, and examples of computer programs developed by B.S.R.A. (British Ship Research Association) for this purpose are cited.

Example B.

Abel, Emily K. Benevolence and social control: advice from the Children's Bureau in the early twentieth century. *Social Service Review*. 68(1): 1-19; 1994.

The correspondence in 1914-15 between Julia Lathrop, chief of the Children's Bureau, and a working-class woman is examined in order to help illuminate a growing debate about the effect of state welfare programs on women. Although Lathrop imposed her own definition on her client's needs, helped to undermine women's confidence in their own knowledge and skills, and perpetuated the gender division of labor, she also responded to this correspondent as a unique individual who helped to restore the dignity that other members of the community had eroded.

Example C.

Tamir, Pinchas. The curriculum potential of Darwin's Theory of Evolution. *Interchange*. 24(1/2): 73-86; 1993.

"Unity" and "diversity" are best reconciled by Darwin's Theory of Evolution. Two major dilemmas related to the study of evolution are described. The first, concerning pedagogy, can be solved by teaching the topic at an elementary level in the middle school so that the theory may serve as an "advanced organizer" and returning with in-depth study in the last two years of high school. The second, concerning faith, is a sensitive issue. Some successful approaches are discussed. The place of Darwin's Theory in the all-elective high school biology curriculum is described as well. The role of the theory regarding explanations is especially highlighted.

IV. Abstracts of Monographs and Chapters

Example A. Whole monograph. A single abstract may suffice if the monograph deals with a homogenous subject.

Illinois State Board of Vocational Education and Rehabilitation. Part-time industrial cooperative education, a manual for administrators and coordinators. Springfield, IL; 1967; Series B, Bulletin 198. 165p.

Programs of vocational education are described that are designed to provide high-school youth with opportunities to receive on-the-job training in a trade or industrial occupation, of his or her choice, by cooperatively utilizing the resources of the school and community. This revised edition presents the basic philosophy, activities, methods, and operational procedures of industrial cooperative education programs. The topical areas include: (1) establishing an industrial cooperative education program; (2) the high-school administrator's responsibilities; (3) the teacher-coordinator; (4) the teacher-coordinator begins his work; (5) selection and placement of student learners; (6) related instruction, coordination, reports, and records; (7) advisory committees: their organization and function; (8) program evaluation in industrial cooperative education; and (9) aids for the teacher-coordinator.

Examples Band C. Chapters. A separate abstract is needed for each chapter if a monograph covers many different topics or is a collection of articles by different authors, as in the case of proceedings of a meeting or symposium. Abstracts of chapters should be as informative as possible, but should at least indicate what is covered.

Example B. Indicative-informative-type chapter abstract.

French, J. L. Psychology and the gifted child. New Outlooks in Psychology. New York: New York Philosophical Library; 1967: 306-336.

A critique of the concept of giftedness concludes that the gifted may be divided into the intellectually capable who are not necessarily academically able, the academically able who must be intellectually capable, the student with hidden talent brought out by opportunity and desire rather than tests, and the highly creative student with minimal academic capacity (IQ of 115) plus an added factor. In a discussion of the special needs of the intellectually superior student for time to think, listen, dream, and converse, it is contended that while added activities should not be forced on the student, he should not be permitted a merely average performance. A discussion of the equity of special programs for gifted students considers advantages and disadvantages of intelligence grouping and acceleration of gifted students. Encouragement of personal independence and autonomy is deemed essential to the productive and innovative development of the gifted. Problems of social adjustment encountered by gifted children include social acceptability and the need to excel without seeming to work very hard. There is a paucity of data on gifted girls and women. The problems of underachievement and dropouts with high IQ scores are discussed.

Example C. Indicative-type chapter abstract.

Sigwait, P. Cyclic sulphides. Frisch, K. C. Ring-Opening Polymerization. New York: Marcel Dekker; 1969: 191-217.

Ring-opening polymerization of alkylene sulphides, episulphides, thioaldehydes, cyclic disulphide, and mixed oxygen-sulphur ring compounds are reviewed, with 83 references. Anionic polymerization, anionic copolymerization, cationic polymerization, coordinated ionic polymerization, and radical polymerization of episulphides, cyclic polymers of thioaldehydes, and the polymerization of oxathiohmes and cyclic disulphides are discussed.

V. Less Common Types of Abstracts

Example A. Critical abstract.

Rosensweig, R. E.; Beecher, N. Theory for the ablation of fiberglass-reinforced phenolic resin. American Institute of Aeronautics and Astronautics Journal. 1:1802-1809: 1963.

The theory of ablation of carbon-contaminated glass, extended from the char-layer theory, gives 38% underprediction of results of the experiment. A thorough error analysis was not included. Spalding and Scala have treated similar problems.

Example B. Slanted abstract. Different versions oriented toward the interests of the plastics, rubber, and protective clothing and aircraft industries.

Stoll, A. M.; Chianta, M. A., Munroe, L. R. Flame- contact studies. Transactions of the ASME, Series C Journal of Heat Transfer. 86(3): 449-456; 1964.

Example B-1. Slanted for the plastics industry.

HT-1, an experimental heat resistant polyamide textile fiber of duPont, was exposed to flame impingement in a Meker burner with a flame temperature of 1200 C. Destruction temperature of fabrics of 3,4,5, and 6 oz/sq yd weight was 427 C, as measured radiometrically. Bum-through occurred in 3-6 seconds, depending on the weight.

Example B-2. Slanted for the rubber industry.

Transient heat flow through a two-layer assembly of RTV-20, a silicone rubber manufactured by General Electric, backed by simulated skin, was measured using a flame-impingement calorimeter. A three-second temperature rise for rubber layers of 0.95, 0.55, and 0.52 mm, measured within the backing layer, agreed excellently with theoretical values.

Example B-3. Slanted for the protective clothing and aircraft industries.

Experiments on the destruction temperature and thermal characteristics of fabrics under flame impinged heating are of great significance to the design of clothing for burn protection. In particular, they help explain why, in experiments with flight overalls, greatly increased burn protection is offered by double-layer clothing as compared to single-layer suits.

VI. Varying the Order of Elements

Example A. Informative abstract with conventional order of elements (purpose, methodology, results, and conclusions).

Thomas, W.O.; Campbell, J.A. Nematode control in sweet potatoes. Miss. Farm Res. 31(3): 7; 1968.

Because damage to sweet potatoes by root-knot nematodes makes it difficult for some growers in Mississippi to produce marketable grades, the Truck Crops Branch Experiment Station in 1967 conducted off-station tests with nematocides (including fumigants) on three- or four-row replicated and randomized field plots known to be infested with the nematodes. Both known and experimental nematocides were employed. The commercial fumigants Vorlex, Dow W-85, and DD significantly increased yields and quality in the treatments of rows. Vortex or DowW-85 should be applied at 2.5 gal/acre and DD at 9 to 10 gal/acre, 8 to 10 in deep in the center of the row, 14 to 30 days prior to planting. Broadcast fumigation was also effective, but required higher fumigant levels. Among the experimental solid nematocides, Bayer 68138 and Dasanit showed promise. More information is deemed necessary than was obtained from this one-season field test.

Example B. Informative abstract of the same document with findings-oriented arrangement of elements (major results and conclusions, supporting details, other findings, and methodology).

Thomas, W.O.; Campbell, J. A. Nematode control in sweet potatoes. Miss. Farm Res. 31(3): 7; 1968.

The yield and quality of sweet potatoes can be increased by soil fumigation or the addition of solid nematocides in some areas of Mississippi. The commercial fumigants Vorlex, Dow W-85, and DD significantly increased yields and quality in the treatments of rows. Vorlex or Dow W-85 should be applied at 2.5 gal/acre and DD at 9 to 10 gal/acre, 8 to 10 in deep in the center of the row, 14 to 30 days prior to planting. Broadcast fumigation was also effective, but required higher fumigant levels. Among the experimental solid nematocides, Bayer 68138 and Dasanit showed promise. This study of control of root-knot nematodes was conducted by the Truck Crops Branch Experiment Station in 1967 on three- and four-row replica ted and randomized field plots known to be infested with the nematodes. More information is deemed necessary than was obtained from this one-season field test.

Example C. Indicative abstract of the same document.

This type of abstract is included here only to demonstrate the validity (usefulness) of preparing an informative abstract when the document permits it, as defined in Section 6.

Thomas, W.O.; Campbell, J.A. Nematode control in sweet potatoes. Miss. Farm Res. 31(3): 7; 1968.

Problems caused by root-knot nematodes in growing sweet potatoes in Mississippi are discussed. Experiments with commercial and experimental nematocides, conducted in 1967 by the Truck Crops Branch Experiment Station, are described. Methods of application including imbedding in rows and broadcasting are compared. Results are given for specific nematocides, including the commercial fumigants Vorlex, Dow W-85, and DD, and the experimental solid nematocides Bayer 68138 and Sasanit.

VII. Position of the Bibliographic Citation for Abstracts in Access Services

Example A. Access abstract preceded by full bibliographic reference. While this order is conventional, it may slow access to actual information; even the document's title is usually subject-oriented rather than findings-oriented.

Anderson, John; Efron, Leonard; Wong, S. Kuen. Martian mass and Earth-Moon mass ratio from coherent S-band tracking of Mariners 6 and 7. Science. 167(3916): 277-79; 1970.

Range and Doppler tracking data from Mariners 6 and 7 have been used to obtain values for the ratio of the mass of the Earth to that of the Moon which are in substantial agreement with those determined from other Mariner and Pioneer spacecraft. There is an inconsistency of about 0.004% in values for the mass of the Moon determined from lunar trajectories. A gravitational constant for Mars of $42\,828.48 \pm 1.38 \text{ km}^3/\text{s}$, obtained on the basis of data collected during the 5 days prior to the closest approach of Mariner 6 to Mars, is in excellent agreement with the result obtained by tracking data of Mariner 4.

Example B. Access abstract followed by full bibliographic reference. This arrangement permits immediate presentation of the main findings of the document, an order particularly suitable for the findings-oriented arrangement of document-content elements (see example VI-B).

The ratios of the mass of the earth to the moon obtained from coherent S-Band tracking of Mariners 6 and 7 are in substantial agreement with those determined from other Mariner and Pioneer spacecraft. Range and Doppler tracking data from Mariners 6 and 7 yielded ratios having an inconsistency of about 0.004% in values for the mass of the Moon determined from lunar trajectories. A gravitational constant for Mars of $42\,828.48 \pm 1.38 \text{ km}^3/\text{s}$, obtained on the basis of data collected during the 5 days prior to the closest approach of Mariner 6 to Mars, is in excellent agreement with the result obtained by tracking data of Mariner 4. Anderson, John; Efron, Leonard; Wong, S. Kuen. Martian mass and Earth-Moon mass ratio from coherent S-band tracking of Mariners 6 and 7. Science. 167(3916): 277-79; 1970.

Example C. Access abstract preceded by the title of the document, but with the remainder of the bibliographic reference suitably displayed after the text of the abstract. This arrangement presents the subject of the document as stated by its author, and then immediately presents

ANSI/NISO Z39.14-1997 (R2015)

the document's information. Indenting or using distinctive typefaces (or both) gives quick access to the remainder of the bibliographic citation.

Martian mass and Earth-Moon mass ratio from coherent 5-band tracking of Mariners 6 and 7.

Range and Doppler tracking data from Mariners 6 and 7 have been used to obtain values for the ratio of the mass of the Earth to that of the Moon which are in substantial agreement with those determined from other Mariner and Pioneer spacecraft. There is an inconsistency of about 0.004% in values for the mass of the Moon determined from lunar trajectories. A gravitational constant for Mars of $42\,828.48 \pm 1.38 \text{ km}^3/\text{s}$, obtained on the basis of data collected during the 5 days prior to the closest approach of Mariner 6 to Mars, is in excellent agreement with the result obtained by tracking data of Mariner 4.

Anderson, John; Efron, Leonard; Wong, S. Kuen. *Science*. 167(3916): 277-79; 1970.