

Introduction to Block 8

Data Analysis and Presentation of Research Findings

Transforming one's data gathered from different sources into research findings to be presented in a written form is a major task of a research process. The two processes are related with each other. We write only what we know and what we know is only that which we are able to gather by observing, communicating and interacting in the world around us.

Mills (1959: 5-7) said,

The sociological imagination enables its possessor to understand the larger historical scene in terms of its meaning for the inner life and the external career of a variety of individuals. It enables him to take into account how individuals, in the welter of their daily experiences, often become falsely conscious of their social positions. Within the welter, the framework of modern society is sought, and within that framework the psychologies of a variety of men and women are formulated. By such means the personal uneasiness of individuals is focused upon explicit troubles and the indifference of publics is transformed into involvement with public issues.

That in brief, is why it is by means of sociological imagination that men now hope to grasp what is going on in the world, to understand what is happening in themselves as minute points of the intersections of biography and history within society

Mills explained why we become curious and how we come to inquire in the social aspects of our being.

Further, Mills (1959: 195) pointed out.

To the individual social scientist who feels himself a part of the classic tradition, social science is the practice of a craft. ...As a social scientist, you have to ... capture what you experience

and sort it out. .. you must set a file, which is, I suppose, a sociologist's way of saying: keep a journal. Many creative writers keep journals; the sociologist's need for systematic reflection demands it. Under various topics in your file there are ideas, personal notes, and excerpts from books, bibliographical items and outlines of projects.

This is how C Wright Mills advised sociologists to build their capacity to understand social reality. The purpose of giving these classical views C. Wright Mills is to point out that the craft of "doing sociology" is multi-dimensional and without undermining collection of data as per methodological orientation, it is important to also focus on its analysis and presentation. In Block 7 we had units focusing on field research and formatting and analysis of qualitative research data. We now turn application of newly available tools of information technology.

Block 8 on Data. Analysis and Presentation of Research Findings has five units. The first four units deal with the use of information and communication technology in analyzing the data gathered during social research and then also with the ways of presenting the research findings. The fifth unit contains guidelines for carrying out a fieldwork-based research project. Let us look at the content brief of each of the five units of Block 8.

Unit 29 on Using Internet and Word Processor tells us how to understand the basics of the Internet and its various utilities. It distinguishes between different types of resources available over the Internet and provides a list of Internet sites that can support social research.

Unit 30 on Using SPSS for Data Analysis describes how to understand the use of SPSS in analyzing the data collected from different sources. Next, it tells us how to start and exit the SPSS programme and also to enter the data into a SPSS Data Editor. In addition, the Unit explains

how to import a data file from the Excel programme and use SPSS for simple statistical analysis of data.

Unit 31 on Using SPSS in Report Writing explains how to edit the SPSS output tables to suit the needs of writing a research report. It tells about creating and editing charts for graphic presentation of one's data analysis. It spells out how to copy the SPSS edited tables and charts directly in the research report.

Unit 32 on Tabulation and Graphic Presentation provides a general structure for presentation of research findings and explains the role of ICT in presentation of research findings. Next, it offers case studies and steps for report presentation.

Unit 33 on Guidelines to Research Project Assignment contains an overview of the course material of MSO 002 for building up guidelines for the research work to be undertaken by the learners. It provides the procedure to follow a research project in terms of its objectives and various stages of planning, executing the research and finally writing it up and submitting the same at the Study Centre for evaluation.

UNIT 29 USING INTERNET AND WORD PROCESSING TOOLS

Structure

- 29.1 Introduction
- 29.2 Objectives
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- 29.11 Conclusion
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29.1 INTRODUCTION

In the Units of Block 7 we mentioned that information and communication technology (ICT) provides a fair bit of aid to a sociologist who is engaged in studying social reality. Unit 29 explains how to use the features of the new technology. This Unit explains what is the Internet and how it helps a researcher in various ways. It is quite possible that you are already aware of such inputs and in that case the contents of this Unit would appear to you quite elementary but for

those who are yet to become familiar with this revolution in the way we learn, Unit 29 will be of great use and help. With the increasing availability of inexpensive personal computers and the State's efforts to provide easy connectivity to the Internet at an affordable price, it is hoped that more and more users in India will be conducting formatting and processing of their researches with the help of ICTs.

Information and Communication Technology (popularly known as ICT) has revolutionized each aspect of human life. The well-known abbreviation "www" (or the "World Wide Web") is an individual's gateway to the whole world. Gone are the days when accessing a library used to be a full fledged event in itself, from seeking permission to getting cards then the long exercise to find out what one needed. All this was compounded if it required travel to another city. Accessing libraries and resources outside the country was a dream. Now, all this and a lot more are available at our desk. With the click of a button, we have all that we need provided we are skillful in using computers and accessing the Internet.

29.2 OBJECTIVES

After studying this Unit, you should be able to:

- Distinguish between different types of resources available over the Internet;
- Build up a list of Internet sites that can support social research;
- Explain use of statistical software for data analysis; and
- Use in your research the Internet and the word processing tools.

29.3 WHAT IS INTERNET AND HOW DOES IT WORK?

The Internet is a network of networks, linking computers to computers. It is the transport vehicle for

the information stored in files or documents on another computer. It can be compared to an international communications utility servicing computers. It is sometimes compared to a giant international plumbing system. However, the Internet itself does not contain the information. It may not be correct to say that a “document was found on the Internet.” Rather, we should say that it was found *through* (or by using) the Internet.

Users of computers may use through the internet one or all of the following internet services.

- **Electronic mail (e-mail):** It permits one to send and receive mail. It provides access to discussion groups through e-mails.
- **Telnet or remote login:** It permits one to log onto another computer and use it as if one were there.
- **FTP (or File Transfer Protocol):** It allows one's computer to rapidly retrieve complex files intact from a remote computer and view or save them.
- **The World Wide Web (www or “the Web”):** The largest and the fastest growing activity on the Internet.

How does the Internet work?

Every computer connected to the Internet is part of a network. For example, you may use a modem and dial a local number to connect to an Internet Service Provider (ISP). At work, you may be part of a local area network (LAN), but you most likely are still connected to the Internet using an ISP that your institution has contracted with. When you connect to your ISP, you become a part of their network. The ISP may then connect to a larger network and become part of their network.

As said earlier, the Internet is simply a network of networks.

A typical Internet website address or a URL looks like <http://www.ignou.ac.in>. In this name <http://> denotes that the computer will use Hypertext Transfer Protocol for communicating. WWW or World Wide Web is the source where this website would be located; ignou denotes the unique name given to the particular website and ac.in represents the Domain Name Server which will handle the request and provide the requested website page (for an example see Box 29.1)

Box 29.1 Example of How Does The Internet Work?

Let us say that you type the URL <http://www.ignou.ac.in> into your browser[®]. The browser contacts a DNS server to get the IP address[®]. A DNS server would start its search for an IP address by contacting one of the root DNS servers. The root servers know the IP addresses for all of the DNS servers that handle the top-level domains (.COM, .NET, ORG, etc.). Your DNS server would ask the root for www.ignou.org and the root would say, “I don’t know the IP address for www.ignou.ac.in but here’s the IP address for the ac.in DNS server.”

Your name server then sends a query to the ac.in DNS server asking if it knows the IP address for www.ignou.ac.in. The DNS server for the ac.in domain knows the IP addresses for the name servers handling the www.ignou.ac.in domain, so it returns those.

Your name server then contacts the DNS server for **www.ignou.ac.in** and asks if it knows the IP address for www.ignou.ac.in. It actually does, so it returns the IP address to your DNS server, which returns it to the browser, which can then contact the server for www.ignou.ac.in into get a Web page.

Accessing Internet

Individuals and companies desirous of using Internet access services have a range of options available, which vary considerably in terms of service quality, and price. There are several free dial-up Internet Service Providers that provide a basic level of access at no cost. For a company intending to engage in a substantial amount of e-commerce involving high bandwidth content, a specialized solution is required at the other end of the range. The company would lease a line with a certain capacity (e.g. 20Mbps) with the Web site professionally hosted. The variables to consider are: price, type of connection (dial-up, instant, dedicated), ancillary services available (Web site hosting, intranet/extranet provision, services), download speed (the speed that information travels to you) and upload speed (the speed of information sent by you).

The most common Internet access procedures are:

- **Dial-Up Internet:** This is the most commonly used service for individuals, and for small businesses with e-mail and a Web site. A wide range of operators exist providing national and regional services, most offering Web site hosting (some included in the monthly, access fee) and helpdesk services. It requires a modem and a telephone line through which it can be connected to ISP using unique user identification and password.

In India, the major Internet Service Providers for dial-up connections include VSNL, MTNL along with other regional level providers. When you purchase an account from any of these ISPs, you get a unique username and a password, along with a dial up number. When you connect the modem to the telephone line and dial-up, it asks for the username and password after which it connects to the ISP from where you can access the Internet.

- **ISDN** (Integrated services digital network): ISDN allows a customer to have a 64kbps Internet

circuit and telephone/fax line at once or a dial-up connection at speeds of up to 128 kbps. This service is suitable for a business that may have a small number of users on-line at the same time or needs to transfer files of substantial size (such as graphics), which would be too slow over a dial-up connection. In most cases for ISDN Internet access, a customer needs to have an ISDN line installed to the premises.

- **Cable modem:** While using different technologies, these two products deliver high speed Internet access on an “instant connection” basis (no dial-up required). The download speeds vary from 512 kbps to 2 Mbps and upload speeds are of 128-740 kbps.

Specific Advantages of Internet

Compared to traditional sources of information for research, the Internet offers the following additional possibilities:

- **More up-to-date material:** Official publications are often published onto the Internet before they arrive in the library, and news services are updated throughout the day.
- **Increased access to material:** It is absolutely impossible for any single library to hold paper copies of all the information that is available on the Web. Also you have access to the Internet 24 hours a day.
- **Interactivity:** Some sites have e-mail discussion forums where you can debate issues and send comments.

Let us complete Reflection and Action 29.1 and assess the level of our understanding of the help ICTs can provide in social research.

Reflection and Action 29.1

ICT has a vital role to play in social research as it provides access to a large resource of books, journals, data sets and software for analysis. Find out what type of access to the Internet is available at your Study Centre. If the Study Centre has no access to the Internet, visit the nearest cyber cafe in your locality and after discussing with the cyber cafe in-charge, find out which of the following types of Internet access is available at that café.

- Dial-up Internet;
- ISDN (Integrated services digital network; and
- Cable modem.

Try to use this facility at least once to find out a few items of information necessary for your research project and then write a note of ten lines to tell whether this method of seeking information is useful. Mention the problems, if any, faced in the process.

29.4 INTERNET SERVICES

The following description provides us information about the various types of Internet services now commonly available to all researchers and the general public.

World Wide Web (www)

The WWW incorporates all the Internet services. You can retrieve documents, view images, animations[®], and videos, listen to sound files, speak and hear voice, and view programmes that run on practically any software in the world, providing your computer has the necessary hardware and

software[@] to do these things.

When you log onto the Internet using Netscape or Microsoft's Internet Explorer or some other browser, you are viewing documents on the World Wide Web. The current foundation, on which the WWW functions, is the programming language called HTML. It is HTML and other programming embedded within HTML that makes possible Hypertext. Hypertext is the ability to have Web pages containing links, which are areas in a page or buttons or graphics on which you can click your mouse button to retrieve another document into your computer.

This "clickability"[@] using Hypertext links is a feature, which is unique and revolutionary about the Web.

Every document or file or site or movie or sound file or anything you find on the Web has a unique URL (Uniform Resource Locator) that identifies the thing on the computer, where it is, and its specific file name. Every Hypertext link on every web page in the world contains one of the URLs.

When you click on a link of any kind on a Web page, you send a request to retrieve the unique document on some computer in the world that is uniquely identified by that URL. URLs are like addresses of Web pages. A whole cluster of internationally accepted standards (such as TCP/ IP and HTML) makes possible this global information retrieval phenomenon that transcends political and linguistic boundaries.

Electronic Mails or E-mail

The most basic and perhaps one of the most useful components of the Internet is the one that came first---electronic mail (or e-mail), which enables rapid local and global information exchange and has forever rebranded its much slower manual cousin as snail mail. E-mail is a particularly effective

way of communicating not only with friends but also with business partners and groups of people you may be working with. It allows for rapid updates on progress and for questions to be asked and answered in double quick time. Within a decade a host of rival and proprietary e-mail formats have been devised for use on different computing platforms, which mostly could not talk to each other. However, as the Internet became more widespread and standards were implemented to enable different e-mail systems to communicate transparently, the use of e-mail has remarkably increased. It is not only a key part of internal communication within and between businesses but is used by virtually everyone who has a personal computer (PC).

Using E-mail

Now e-mail comes as an integral part of your browser software (for example Outlook Express with Microsoft's Internet Explorer). On setting up your browser software you are also asked to establish your connection to the Internet Service Provider (ISP). You will be asked to enter your e-mail address. The first part of the e-mail address is your choice but it should be unique with your ISP; then comes the sign “@” followed by the name of your ISP. Your ISP will provide you with essential codes to create a new account. The software will also ask you to provide a name by which you would like to be identified when someone receives an email from your account. You will also need to key in your user name and a password agreed on with your provider.

Sending e-mail is a simple task. You can write your correspondence directly in the email software or in another word processing programme and attach it to the e-mail so that the formatting remains intact. If you want to send your e-mail to several people you can easily do that by using the carbon copy (cc:) option. If you want to keep the identities of the other parties receiving the e-mail secret then you can enter their addresses into the blind carbon

copy (bcc:) field. Once finished, hit the 'send' button and the e-mail goes from your computer. You can opt to keep copies of every message sent in the "sent box" which acts as a good record for future reference or you can begin to organize mail sent and received by category or project in files within your mail software (see Box 29.2 to understand how e-mail works).

Box 29.2 How Does E-mail Work?

1. Once you have composed an e-mail and hit the send button, your e-mail programme sends your mail to the SMTP server where your account is.
2. The SMTP server breaks the address someone@theirdomain.com into two parts: someone else (the account name) and theirdomain.com (the domain). The SMTP server then contacts the DNS server, and asks for the IP address where theirdomain.com is located.
3. The DNS server sends the address back to the SMTP server.
4. The SMTP server then sends the e-mail message to the SMTP server where theirdomain.com is located.
5. The second SMTP server delivers the e-mail message to someone else's account.
6. Someone else logs on to the computer and opens the email software, which then connects to the server. The software then requests the server to send all e-mail from their account to their computer.

E-mail is an amazing communications tool once you have mastered it and learnt the basic rules. However no one likes to receive a spam or unsolicited e-mail unless they have opted to be part of your network of contacts or potential customers. Spam is a frustrating reality

on the Internet and those who persist in sending it are not regarded as good net citizens. With personal or business messages one is advised to read and re-read one's e-mails carefully before hitting the send button as misunderstanding and embarrassment can arise quickly through hasty responses.

29.5 SEARCHING ON THE WEB SEARCH ENGINES

Search Engines for the general Web do not really search the World Wide Web directly. Each one searches a database[@] of the full text of Web pages selected from the billions of Web pages out there residing on servers. Search engine databases are selected and built by computer robot programmes called spiders. Although it is said that they “crawl” the Web in their hunt for pages, in reality they stay at one place. They find the pages for potential inclusion by following the links in the pages they already have in their database (i.e., already “know about”). They cannot think or type a URL or use judgment to “decide” to go look something up and see what's there on the Web about it.

Using search engines

This is the most common form of text search on the Web. Most search engines do their text query and retrieval using keywords. A keyword can be any word on a Web page. It is important to use keywords relevant to the topic you are searching. Combinations of words or multiple words can be used as keywords and the Search Engine will display all the Web pages in its database that contain most of the keywords used by you. For example, if you wish to find out statistical software materials that are downloadable free from the net, the key words could be “Statistics Software Free”. Remember some search engines index every word on every page, while others index only a part of the document. Also, some of the search engines discriminate upper case

from lower case; others store all words without reference to capitalization.

Keyword searches have a tough time distinguishing between words that are spelled the same way but mean something different (i.e. hard cider, a hard stone, a hard exam, and the hard drive on your computer). This often results in hits that are completely irrelevant to your query.

Search engines also cannot return hits on keywords that mean the same but are not actually entered in your query. A query on “heart disease” would not return a document that used the word “cardiac” instead of “heart.”

Most sites offer two different types of searches---“basic” and “advanced.” Advanced search options differ from one search engine to another, but some of the possibilities include the ability to search on more than one word, to give more weight to one search term than you give to another, and to exclude words that might be likely to confuse the results. You might also be able to search on proper names, on phrases, and on words that are found within a certain proximity to other search terms.

Many search engines allow you to use the so-called Boolean[®] operators to refine your search.

These are the logical terms AND, OR, NOT, and the so-called proximal locators, NEAR and

FOLLOWED BY

- **AND** means that all the terms you specify must appear in the documents, i.e., “heart” AND “attack.”
- **OR** means that at least one of the terms you specify must appear in the documents, i.e., bronchitis, acute OR chronic.

- **NOT** means that at least one of the terms you specify must not appear in the documents. i.e., statistics AND calculator, NOT mathematics.
- **NEAR** means that the terms you enter should be within a certain number of words of each other.
- **FOLLOWEDBY** means that one term must directly follow the other.
- **PHRASES:** The ability to query on phrases is very important in a search engine. Those that allow it usually require that you enclose the phrase in quotation marks, i.e., “heart attack.”
- All the search engines have different methods of refining queries. The best way to learn them is to read the help files on the search engine sites and practice.

Some of the most commonly used Search Engines are:

- **Google** (<http://www.google.com>)

Google provides the option to find more than web pages. Using on the top of the search box on the Google home page, you can easily seek out images from across the Web, discussions that are taking place on Usenet newsgroups, locate news information or perform product searching. Using the More link provides access to humancompiled information from the Open Directory, catalogue searching and other services.

- **Yahoo** (<http://www.yahoo.com>)

Launched in 1994, Yahoo is the Web’s oldest “directory”, a place where human editors organize Web sites into categories. In addition to excellent search results, you can use tabs above the search box on the Yahoo home page to seek images, Yellow Page listings or use Yahoo’s excellent shopping search engine. Or visit the Yahoo Search home page, where even more specialized search options are offered.

- **Ask Jeeves** (<http://www.askjeeves.com>)

Ask Jeeves initially gained fame in 1998 and 1999 as being the "natural language" search engine that let you search by asking questions and responded with what seemed to be the right answer to everything.

- **AllTheWeb.com** (<http://www.alltheweb.com>)

Powered by Yahoo, you may find AllTheWeb a lighter, more customizable and pleasant "pure search" experience than you get at Yahoo itself. The focus is on Web search, but news, picture, video, MP3 and FTP search are also offered

- **AOL Search** (<http://aolsearch.aol.com> (internal) and

<http://search.aol.com> (external) AOL Search provides users with editorial listings that come from Google's crawler-based index. Indeed, the same search on Google and AOL Search will come up with very similar matches.

- **HotBot** (<http://www.hotbot.com>)

HotBot provides easy access to the Web's three major crawler-based search engines: Yahoo, Google and Teoma. Unlike a **meta search engine**, it cannot blend the results from all of these crawlers together. Nevertheless, it is a fast, easy way to get different Web search "opinions" in one place.

Some other options for Search Engines are:

Teoma (<http://www.teoma.com>)

Gigablast (<http://www.gigablast.com>)

LookSmart (<http://www.tooksmart.com>)

Lycos (<http://www.tvcos.com>)

MSN Search(<http://search.msn.com>)

NetscapeSearch(<http://search.netscape.com>)

Open Directory (<http://dmos.org>)

About.com (<http://www.about.com>)

Britannica.com(<http://www.britannica.com>)

Excite (<http://www.excite.com>)

Won (<http://www.iwon.com>)

PepeSearch (<http://www.pepesearch.com/>)

SearchKing (<http://www.asearchking.com>)

Complete Reflection and Action 29.2 and find out if you are able to make use of the ICT aids available at present.

Reflection and Action 29.2

Find out what type of access to the Internet is available at your Study Centre. If the Study Centre has no access to the Internet, visit the nearest cyber cafe in your locality and carry out the following tasks.

- Open an e-mail account if you do not already have one.
- Send an e-mail to your friend who should have an e-mail account and you should know your friend's email address.
- Access any of the above-mentioned search engines to obtain some items of information necessary to your research project.
- Visit a couple of websites, for example one to give you information about the current jobs available; another one about natural disasters currently occurring all over the world.

After completing the above tasks, write a short note on advantages and disadvantages of

using ICT tools.

29.6 ACCESSING AND USING ONLINE INFORMATION

If you are a researcher dealing with any of the social sciences, you would be more interested in using the social science research reference sites. Here is some information about them.

Social research reference sites

Using commonly available Search Engines (e.g. Google, Yahoo etc.) is not one of the best and recommended ways to initiate research through the Internet. Given the limitations of search engines, there are several other options available where the search results can be far more precise.

The search for Social Research can be classified in the following categories:

Directories and gateways

These provide an entry point for resources collated specifically for a chosen area, which you may search and browse. Unlike search engines, which automatically collate a list of sites, which match your search criteria, directories and gateways can provide a more fruitful search for your chosen topic. Gateways are an excellent place to find high quality Internet sites that can support academic work. Some of the advantages of using directories and gateways are:

- Gateways are compiled by academic and library experts after devoting considerable time to scanning the Web for items of interest.
- Gateways are classified in structured and useful ways so that one can access the resources more easily.
- Gateways are regularly updated.

A few examples of effective gateways for social science researchers are:

- **The Social Science Information Gateway (SOSIG)** (<http://www.sosig.ac.uk/>) This gateway has links to online papers, discussion lists and courses. It contains Web pages of several departments and organizations. It has a complete section for social research methods, including both quantitative and qualitative resources.
- **Sociosite: Research Methodology and Statistics** (http://www.pscw.uva.nl_sociosite-/TOPICS/Research.html)-This is a sociological information system that provides access to a comprehensive and international listing of all sociology related resources on the Internet and has a special section devoted to research methodology and statistics
- **Social Science WWW Virtual Library** (<http://www.clas.ufl.edu/users/gthursby/socsci/index.htm>)-This keeps track of online social science information as part of the World Wide Web Virtual Library.

Article reference and abstracts databases

One always needs to keep oneself aware of the latest publications in one's field. The Internet offers ways to find about these publications via online catalogues of references and abstracts.

While access to some of these sites is free, some require initial membership, which is generally provided to libraries and institutions. It is likely that your institution (or library) has the membership of some of these databases and you can access these after obtaining the Password from your institution/library.

Some popularly accessed databases are:

- **Social Science Citation Index (SSU)** (<http://www.isinet.com/products/citation/ssci/>)

It contains around 5,000 journals spanning 50 social science disciplines. It covers most

of the major journals, which address social research methods dating back to 1973. From a search you can obtain titles and for over half the author abstracts you can also retrieve titles of citations references.

- **International Bibliography of the Social Sciences (IBSS)** (<http://lse.ac.uk/ibss/>)

This provides easy access to over 1.5 million references to journal articles, book reviews and monographs from 1951 onwards.

- **Sociological Abstracts** (<http://www.socabs.org/detailsV3/socioabs.html>)

It indexes and provides abstracts from many publications covering social research methods.

29.7 ONLINE JOURNALS AND TEXTS

Most journals in the social sciences have Web sites where both current and backdated research articles and papers are available for reading and downloading. Gaining access to full text in most of the online journals requires subscription. On obtaining it, a password is provided for full access. However, most of these journals provide abstracts and/or table of contents free. There are a few directories that provide lists and links to electronic journals. Two such directories are:

- **Directories of Electronic Journals** (<http://gort.ucsd.edu/ejournal/dir.html>)---contains links to electronic journals and newsletters across the world.
- **The Journal Locator in Psychology and the Social Sciences** (<http://www.wiso.uni-augsburg.de/sosio/hartmann/psychojournals.html>)--- It lists over 1,600 online journals and provides links to their home pages.

Examples of online journals covering social research methods

- **Sociological Research Online** (<http://www.socresonline.org.uk/>---This is an online journal that publishes high quality applied sociology articles, focusing on theoretical,empirical and methodological aspects.
- **Social Research Update** (<http://www.soc.surrey.ac.uk/sru/sru.html>)- This is a quarterly electronic journal which covers new developments in social research. Each issue covers different research methods topics spanning qualitative and quantitative methods.

While full text articles can be browsed free of charge from the online journals mentioned earlier, the following only provide free access to abstracts and table of contents:

- **International Journal of Social Research Methodology, (IJSRM)** (<http://www.tandf.co.uk/journals/tf/13645579.html>---It is a new journal of methodological articles and articles relating to research practice in professional and service settings.

There are also some specialized sites available that archive full texts of paper deliberated or presented during Conferences and Seminars. One such site of interest is **Education Online:Electronic Texts in Education and Training** (<http://www.teeds.ac.uk/educot/>).

Library catalogues

Several libraries across the world provide online-access to their catalogues. Library catalogues are sometimes referred to on the Web as OPACS which stands for Online Public Access Catalogues.

Sometimes these catalogues can only be accessed through passwords, which are available through free registration on site. Some of the relevant sites are:

- **The British Library Catalogue** (<http://blpc.bl.uk/>)

This is an online resource for materials in the major reference and document supply centres of one of the world's largest libraries.

- **Worldwide Index of Library Catalogues**(<http://www.libdex.com/>)More than 18,000 libraries can be reached through a specialized search from this website.

Assorted useful websites

- **Glossary of Research Terms** (<http://www.mori.com/rmu/glossary.shtml>) provides explanations of topics and technical terms for researchers.
- **Social Science Research Methods: Resources for Teachers** (<http://www.siu.edu/%7Ehawkes/methhome.html>) has links to courses on research methods and teaching materials as well as other materials of interest.
- **The Centre for Applied Social Surveys (CASS)** <http://www.socstats.soton.ac.uk/cass/>)offers a programme of short courses on social survey methods, covering all aspects of quantitative survey.
- **Index to Theses** (http://www.theses.com/registered_users/simple.html)provides a searchable database of abstracts of masters and doctoral theses accepted by Universities in Great Britain and Ireland from 1970 till date.

Reflection and Action 29.3

It is always better to decide on the needs and identify the broad category under which the information necessary for your research project might fall. It helps in pinpointed search and provides the desired results in relatively less time. It is true that general search engines are of limited help in social research. There are specialized Search Engines created for Social Research.

Try to obtain the information needed by your research project from one of the sources mentioned above and then write down in one page how you obtained the information and the time you

spent in getting it and how you are going to use that information in your research.

29.8 STATISTICAL REFERENCE SITES

- **The CHEST Directory** (<http://www.chest.ac.uk/chestdirectory/intro.html>) contains a wide range of software, including those for data and statistical analysis. There are several other subject specific sites (e.g. for anthropology, psychology) that provide free access to software required for quantitative and qualitative analysis. Some examples are:
 - **Computer Assisted Qualitative Data Analysis Software (CAQDAS) Network** (<http://caqdas.soc.surrey.ac.uk/>)
 - **Directory of Psychology Software** (<http://www.psychology.itsn.ac.uk/>)
 - **Free Statistical Software** (<http://members.aol.com/johnp71/javasta2.html>)

Software for Statistical Data Analysis Computer software is used to perform any level of complex statistical analysis with any amount of data available. There are three ways through which software can be obtained for performing these tests:

1) **Purchasing licensed software from the companies**

SPSS (or Statistical Package for Social Scientists) is the “most preferred software to carry out any level of statistical analysis (you will read more about this package and its use in Unit 30). With SPSS, one can generate decision-making information quickly using powerful statistics, understand and effectively present results with high-quality tabular and graphical output, and share the results with others using a variety of reporting methods. All this enables the user to make smarter decisions more quickly by uncovering key facts, patterns and trends.

SPSS is highly priced. Generally institutions and organizations purchase multiple user licensed version of this software and provide access to its students and employees. Purchasing SPSS by an independent user is generally not economically viable. However, there are other moderate/low priced software available for single users. One such software available is “StatCalc”. It simplifies common statistical calculations, allowing quick analysis of raw data whether you enter it yourself, use a spreadsheet, or maintain a database. A 30 day trial version of this software is available from their website (<http://www.acastat.com/prod01.htm>)

2) Downloading free software from the Internet

There are several committed professionals whose aim is to popularize the use of statistics by making it simple and affordable. These people have created software that can perform a wide range of statistical analyses, requiring minimal computer proficiency. The software can be downloaded from the Internet in about 30 to 90 minutes with reasonable Internet speed. No licensing is required to use such software.

Such a popular and free statistical software is “Openstat”. This software is similar to SPSS in appearance and operation. Though not as comprehensive as SPSS, it provides a wide range of options to a social researcher. It has the capacity to handle large data; it can import from and export data to other software and can perform all commonly used statistical tests. Someone conversant with Openstat can effectively use SPSS for all similar applications and vice versa. The software can be downloaded from the URL (<http://www.statpages.org/miller/openstat/>).

3) Online web pages

These are quick solutions to small statistical problems. These may or may not be downloadable but provide free access. Several of these Web pages provide options for data import. In the

majority of the situations these work as handy scientific calculators but are certainly advanced from being simply calculators as they can perform multiple tasks including data entry and producing charts, etc. Before clicking on to any of these calculators, one should have analyzed the problem and identified the exact test that is to be applied.

Statistical calculators for descriptive statistics and charts

1) **Descriptive sampling statistics**(http://home.ubalt.edu/ntsbarsh/Business-stat/other_applets/Descriptive.htm)--This page can calculate some basic descriptive statistics, like mean, variance, SD, CV, skewness[@] and kurtosis.[@] It can analyze a maximum of 80 numbers. In the matrix that appears on the web page enter the numbers into each of the Columns on top of the matrix and hit "Calculate". All the calculations mentioned below appear. In case a Histogram is required, provide Class Width and "Number of Classes" in the boxes and hit "Histogramming". The histogram will be drawn that can be selected, cut and pasted in any document for further use.

There are several other such online calculators available on the Internet. To provide some more examples, the following links may be attempted:

2) **Descriptive statistics** (mean, SD, SEM, and CI of mean) (<http://graphpad.com/quickcalcs/clmean1.cfm>)--One can either enter or paste raw data, or enter mean, SD or SEM, and N to get Class Intervals.

3) **StatCalc** (<http://math.uc.edu/statistics/statbook/java/StatCalc.html>)---This calculator computes summary statistics for one variable, draw a crude histogram, and sort a list of values. Given pair of values it computes the least squares regression line and Pearson correlation coefficient. It can also perform Chi Square test. The can be either directly entered or pasted from other worksheets like Excel.

4) **Statiscope** (<http://www.df.lth.se/~mikaalb/statiscope/statiscope.shtml>)---This can be used for calculating and displaying a large number of descriptive statistics from a set of numbers that can entered directly into the calculator.

Reflection and Action 29.4

There are several options available for carrying out statistical analysis. This includes online calculators as web pages that can quickly run the calculation and give results.

There are several statistical packages that can be downloaded free of charge through the Internet and can be used for almost all basic statistical tests.

You need to remember that ICT and computer software packages have a limited use in qualitative data analysis. As all social researches have some component of quantitative data, we suggest that for analyzing quantitative type of data pertaining to your research project, you try to use the basic tools mentioned above. After making an effort to do so, it is important that you mention in your research project report all the ICT tools that you used in your research. In the evaluation of your assignment this will be taken into special consideration..

29.9 DATA SOURCES

There are several websites that provide real data (both raw and tabulated data). These websites provide country-specific data. Access to data from these websites is generally not free and membership is required.

Statistical Data on the Web

(<http://www.lib.umich.edu/govdoes/stforeign.html>) provides access to select socio-economic data from various countries in the world. A few websites for Indian data are:

- Census Data Online (<http://www.censusindia.net/cendat/>)
- India Stat.com (<http://www.indiastat.com/>)

Statistical and research methods

There are several sites dedicated to tutor or guide researchers on Research Methods and the latest developments in upgrading these methods. of the popular sites in this category are:

SRM (Social Research Methodology)---Documentation Centre
(<http://www.niwi.knaw.nl/nlsrm/srm.htm>)---contains a searchable database of resources on research methodology and statistics for social and behavioural sciences on an international scale.

Sociological Methodology [<http://www.blackwellpublishers.co.uk/journals/SM/contents.htm>]
is an annual volume on methods of research in social sciences. Sponsored by the American Sociological Association, it publishes materials that advance empirical research in sociology and related disciplines.

Qualitative research

[<http://qrj.sagepub.com/>] provides a forum for the discussion of research methods, in particular qualitative research.

International Journal of Social Research Methodology
(IJSRM)[<http://www.tandf.co.uk/journals/tf/13645579.html>]

Public Opinion Quarterly (POQ)

[<http://www.poq.oupjournals.org/>] is the official publication of the American Association for Public Opinion Research (AAPOR) and focuses on theories and methods

underlying opinion research (such as survey validity, questionnaire construction, interviewing and interviewers, sampling and analytic approaches).

The CASS Question Bank

This question bank provides free access to questionnaires from major social surveys and associated commentary to assist survey design:

29.10 USES OF E-MAIL IN RESEARCH

Using e-mail as a research tool potentially offers researchers many advantages such as easy access to world-wide samples, low administration costs (both financially and temporally) and its unobtrusiveness and “friendliness” to respondents. However, e-mail’s application as a research tool is constrained by its, as yet, limited and biased population of users (in terms of age, income, gender and race). Response rates to e-mail questionnaires appear favourable as does the ease of distribution and response times. Nevertheless, ensuring respondents’ anonymity is virtually impossible. Using e-mail as an interview tool takes away the conventional constraints of spatial and temporal proximity between interviewer and respondent and offers the considerable practical advantage of providing “ready-transcribed” data. However, e-mail interviews suffer from a lack of tacit communication.

The principal feature of using e-mail as a research tool is its speed and immediacy. An almost instantaneous dialogue between the researcher and the subject takes place. In particular, electronic communication sets up a “democratization of exchange” that eludes more conventional research methodologies. Furthermore, the potential for asynchronous communication that e-mail offers is an attractive feature when considering its use as a research tool. Subjects are

not constrained to synchronous communication but can respond when and how they feel comfortable. E-mails are most commonly used to fill in electronic questionnaire and conduct electronic interviews.

However, as electronic communication becomes more common, there will be *information overload* and research via e-mail runs the risk of becoming marginalized as a form of electronic “junk mail”. Unsolicited attempts to gain information via e-mail by genuine researchers may be ignored by the recipient at the other end of the line.

The proliferation of e-mail, along with the increasing ease of carrying out e-mail and Internet-based research, suggests that the use of electronic methodologies is likely to increase in popularity in the near future. However, as said earlier, there remain significant problems in using email in social science research. Despite the rapid expansion of e-mail, its use as a research tool will reflect the demographically based biases of current usage patterns of the medium, in much the same way that early telephone surveys were also hindered by the clear social class bias resulting from an unequal ownership of the facility.

Accessing newsgroups and e-mail lists

Suppose you have a question for which you are sure that someone knows the answer, but how do you find that person? With the Internet you can not only search Web sites for information, but also communicate with people you may never meet, getting answers to obscure questions that only they may know.

Newsgroups also referred to as forums have been around almost since the Internet came into

existence. They help scientists to post questions (and answers) to each other. Today, newsgroups resemble virtual coffeehouses, where people get together to discuss subjects of mutual interest.

The only difference is that with newsgroups, the communication is written, not verbal. Newsgroups revolve around specific topics, such as effectiveness of computer analysis in qualitative research.

You can read what others have written and post your own comments.

There are thousands of newsgroups covering almost every topic, from computers, social issues, literature and science, to recreation, entertainment, hobbies and current affairs. In newsgroups, you can find job postings, business and health care advice, announcements about events, referrals, political and religious discussions. You may download pictures also. See Box 29.3 to find out how to access a newsgroup.

Box 29.3 How to Access a Newsgroup

To access a newsgroup, you need a newsreader programme. Most Internet explorers have these programmes built in. Next, determine which newsgroups interest you and subscribe to them. Keep in mind that newsgroups were once the only way to have so-called. threaded discussions, where related messages are grouped together. Today, many Web sites have discussion group postings. When you are looking for a discussion to join, look at Web sites as well as newsgroups.

Mailing Lists

Mailing lists use a different strategy. Rather than collecting each message and displaying it in a central location, each message is sent as an electronic mail message to every member of the list. The advantage of mailing lists is that you don't need to use a separate software programme to

read messages posted to the newsgroup. The disadvantage is that you can receive dozens, sometimes even hundreds, of messages per day from a given mailing list.

Newsgroups and mailing lists generate an incredible amount of text each day. Some of them contain detailed analyses of issues and events by contributors who range from interested members of the general populace to acknowledged experts in particular fields. If you subscribe to mailing lists, you can reduce the number of messages you receive each day by using the *digest* command, which tells the computer running the mailing list to send you one message containing several messages. You can learn how to use the *digest* command by sending a message to the computer running the list with the word *help* in the subject line. Remember to send the message to the computer's main address, rather than to the list itself.

If you are working on a research project on a current issue or event, you can locate relevant newsgroups and mailing lists by visiting the Google Group at www.google.co.in or Deja News Web site at <http://www.dejanews.com> or Yahoo's directory of newsgroups and newsgroup posts at http://www.yahoo.com/News_and_Media/Usenet/NewsGroup_Listings/. To search for mailing lists dealing with a particular topic, visit the Lisst Web site at <http://www.lisst.com> or the Catalist Web site at <http://www.lsoft.com/catalist.html>. If you want to analyze a list, discussion, or track back a series of messages, go to Lisst's Email List Archives Search at <http://www.lisst.com/read/>.

To learn more about researching newsgroups, you can view an interactive demonstration. Limiting a Search with Publication Information, which provides a demonstration of searching the Deja News Web site. Deja News, located on the Web at <http://www.dejanews.com>, focuses on the

contents of newsgroups on the Internet.

Reflection and Action 29.5

In Reflection and Action 29.4 we mentioned that ICT and computer software packages have a limited use in qualitative data analysis but here is a source that can help you even in the qualitative research aspects of your project. <http://qrj.sagepub.com/> provides a forum for the discussion of research methods, in particular qualitative research. Try to access this website and find out if it is of any help to your research. Write a short note on your positive or negative findings.

29.11 CONCLUSION

Provided that a researcher is clear about the needs of research, ICT can be effectively used to gain information about any research topic in a social science from across the world. With further advancement in technology, using statistics is no more tedious. It does not require complex mathematical skills and can be easily handled through various software packages available. ICT provides excellent and reliable options for managing, storing, retrieving and use of data by several persons at any given point in time. The exchange of information is swift and fast, and it is possible to access any amount of information which is physically lying anywhere in the world. ICT has a lot of potential for use in social research and if used appropriately, can save a lot of time, energy and other resources. And, as one starts using the Internet, many more potentialities it has for research become clear. The Internet provides an abundant opportunity to mine information, data and insights.

29.12 FURTHER READING

MacFarlane, A. 1977. *Reconstructing Historical Communities*. Cambridge University

Press: Cambridge (especially pp. 207-214)

Nie, N. H., C.H. Hull, J. G. Jenkins, K. Steinbrenner and D. H. Bent 1979. *Statistical*

Package for the Social Sciences. McGraw Hill: New York



Unit 30

Using SPSS for Data Analysis Contents

Contents

- 30.1. Introduction
- 30.2. Starting and exiting SPSS
- 30.3. Creating a data file
- 30.4. Univariate analysis
- 30.5. Bivariate analysis
- 30.6. Multivariate analysis
- 30.7. Tests of significance
- 30.8. Conclusion



Learning Objectives

It is expected that after going through Unit 30, you will be able to

- ❖ Understand the use of SPSS in your data analysis
- ❖ Start and Exit SPSS program
- ❖ Enter the data into a SPSS Data Editor
- ❖ Import a data file from Excel Program

30.1 Introduction

SPSS (Statistical Package for Social Sciences) computer software program provides access to a wide range of data management and statistical analysis procedures. This program can perform a variety of data analysis including tables, statistical analysis and graphical presentation of data. Also, SPSS is particularly well suited to sample survey research.

It is assumed here that you have a basic understanding of the basic concepts and techniques of statistical analysis (see the Units of Block 5 in Book 2). You have also learned how to collect, edit and code data for analysis. In Unit 30, you will learn how to use the SPSS to perform data analysis.

You can run SPSS program on a Personal Computer (PC) within the Windows (95, 98, 2000, XP, or NT) operating system. Since it is a windows based program, you can use the program without any difficulty and more interactively like Word, Excel, or PowerPoint programs. The command instructions given and examples shown in this Unit are Windows based SPSS version 11.5.

Please note that Unit 30 does not carry any information in boxes as it has plenty of graphics to understand the details without the aid of boxes. For Reflection and Action exercises, there are some straight questions for you to answer as the reflection part of the exercise is going to take place during your reading of the text along with its graphics. It is a good idea for you to repeat the viewing of these graphics as many times as

possible and practice using them for carrying out first simpler and later more complex tasks.

30.2. Starting and Exiting SPSS

Normally, SPSS program will be located in the Programs folder of your PC. To start the SPSS,

- 1) Click the left mouse button on the Start button located at the lower left of the screen. A number of items will be listed on the screen.
- 2) Select Programs. The program menu will open.
- 3) Select SPSS for Windows from the programs menu and then select SPSS 11.5 for Windows from the SPSS menu. Click and release the mouse button. Symbolically, these actions are shown as: select Start→Programs→SPSS for Windows→SPSS 11.5 for Windows command from the Start button of your PC. (Throughout this Unit and Unit 32, we will be showing the symbol→to indicate the director (steps)you have to move your cursor with mouse.).

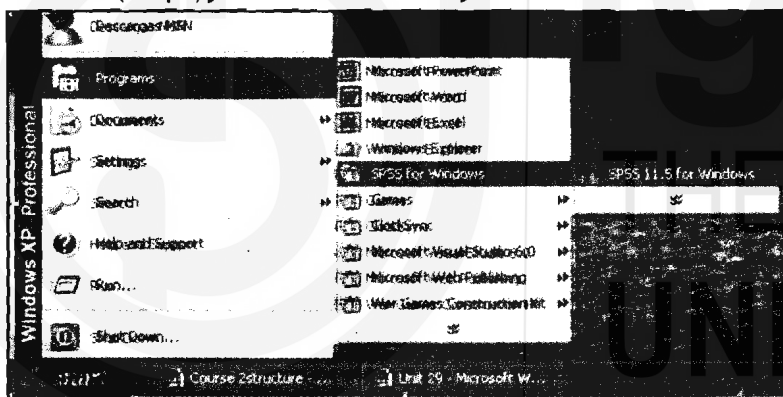


Figure 30.1 SPSS for Windows

- 4) After a few moments, you will see the Data Editor window dialog[®] box along with a SPSS for Windows menu dialog box asking you "What would you like to do?".

Column Head Menu Bar Tool Bar

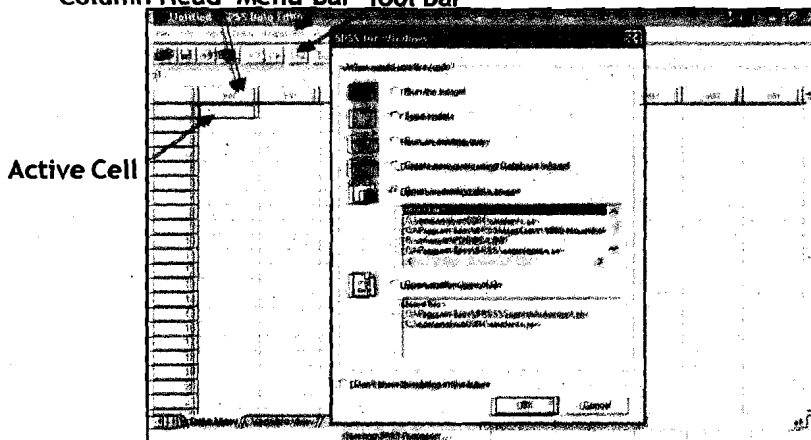


Figure 30.2 SPSS for Data Editor

Exit SPSS Data Editor: Whenever you have finished using SPSS and want to quit it, then select File>Exit command on the menu bar.

30.3 Creating a data file

Normally, the first thing you would like to do is to create a data file. For this, check mark on the box and then click OK button on the SPSS for Windows menu dialog box. The menu dialog box disappears from the screen leaving the Data Editor on the screen.

Data Editor: The Data Editor helps you:

- 1) To enter a series of data you have in a specified format required for data analysis.
- 2) Open an existing file.
- 3) Edit the data.
- 4) Converting other data files into SPSS data files.
- 5) Will be active throughout your session of using SPSS data entry and data analysis.

The Data Editor looks like a worksheet made up of a series of rows and columns. The intersection of a row and column is called a cell. The cells may contain numbers or text. Each column will contain information/data for each variable. Similarly, each row contains information/data for each case.

The first row of the cells located at the top of each column is shaded and contains a faint Var. These cells contain the names of variables. Similarly, the first shaded column contains faint numbers (1,2,3,...). These are called case numbers.

The Data Editor dialog box contains a Menu bar at the top of the window. The menu bar identifies broad categories of SPSS's features called commands. This menu bar helps you in defining and selecting commands.

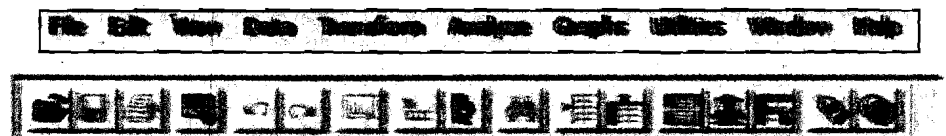


Figure 30.3 Menu bar and Tool Bar of SPSS Data Editor

The Toolbar is below the menu bar and allows you to quickly access basic SPSS commands. By clicking on the respective buttons you can access some commands which will interest you quite often.

Observe the cell at the intersection of row1 (Case 1) and column1 (Var 1) with a heavy border. The heavy border cell indicates that the cell is an active cell. You can enter or edit data in the cell. You can activate any cell in the worksheet by simply pointing the mouse cursor[®] at it and clicking once.

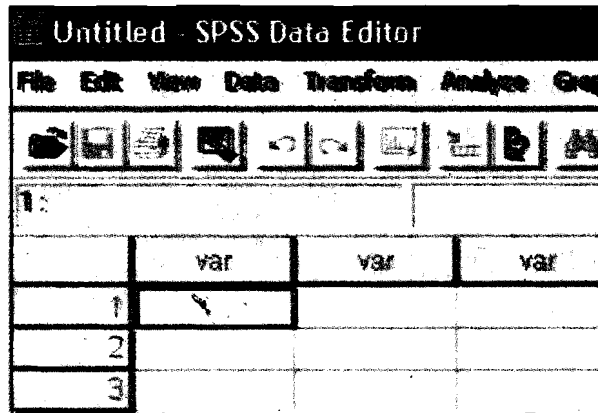


Figure 30.4
Untitled SPSS Data View

There are two views available in the Data Editor: Data View and Variable View. In the Data View, you can see the data the way you have typed. In the Variable View, you can see the properties of each variable defined. To access these views click on the respective buttons located at the left bottom of the Data Editor screen.

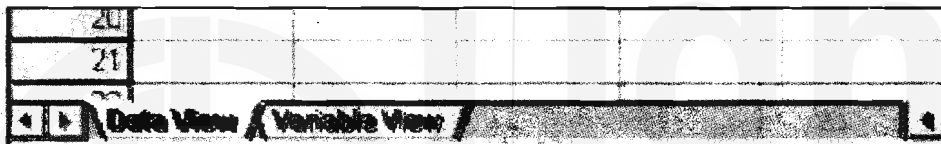


Figure 30.5 Untitled SPSS Variable View

Entering data into Data Editor

As you have learned earlier, your data may contain a number of variables. Examples of variables are sex (male or female), marital status (married, unmarried, widowed, etc.), income, attitude (likes, dislikes, etc.), a score, etc. Again, for each variable you may have a number of observations called cases. You have also learned in an earlier unit how to assign the codes to the qualitative data. For example, you have a data set containing information of 30 people on sex distribution, age, marital status, and income. You also assigned the following codes for the data set.

Sex distribution: male = 1, female = 2

Age in years

Marital status: married = 1, unmarried = 2, widowed = 3

Income in Rs.

The data you might have collected may look like as follows:

Table 30.1
Data Set by Sex, Age, Marital Status and Income for 30 Persons

Case Number	Sex	Age	Marital Status	Income(Rs.)
1	2	24	1	150000
2	1	52	1	345000
3	2	65	3	45000
4	1	35	3	245000
5	1	42	1	23000
6	1	25	1	670000

7	2	23	2	345000
8	2	63	1	156000
9	1	41	2	65300
10	2	48	1	150000
11	1	34	2	354000
12	2	55	3	23000
13	1	28	1	452000
14	1	43	2	120000
15	1	23	2	456000
16	2	65	1	765000
17	2	67	3	235000
18	2	32	2	54000
19	1	30	2	200000
20	2	25	2	180000
21	1	47	1	210000
22	2	36	3	350000
23	2	70	1	42000
24	1	67	3	175000
25	2	24	2	45000
26	1	32	1	234000
27	1	20	2	125000
28	2	25	1	36000
30	2	40	3	560000
30	2	45	1	234000

The process of data entry into the Data Editor involves four basic steps:

- 1) Define variables
- 2) Define labels
- 3) Define missing values
- 4) Enter the data into the cells

We will explain these steps with the help of the data given in our earlier example. For this move your cursor to the left bottom of the Data Editor and click on Variable View button, if the Data Editor is not in the Variable View.

Step-1: Define Variables: You need to define a variable to name it, specify the data type (qualitative, quantitative, number of decimal places, etc.), assign labels to the variable and data values, define missing values, and specify levels of measurement (nominal, ordinal, interval/ratio scale). In addition, you can also define the column format. For this,

1. Activate a cell in the first column by clicking on it.
2. Click on the **Variable View** button. The grid will change to a new format as shown below. For each variable you create, you need to specify all or most of the attributes described by column headings.
3. Activate the first cell in row 1 under **Name** column heading to

change the variable name. Type the name of the variable say Sex and then press enter key. Observe that the variable name Sex replaces with the default variable name Var and in the other cells of the first row the default properties of the variable will appear.

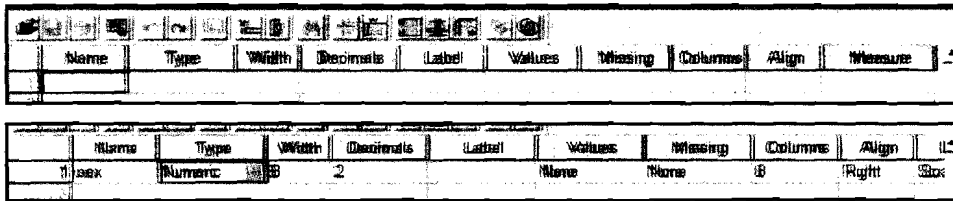


Figure 30.6 Changes in Data Grid and Data Variable

Remember that a variable name can have a maximum of 8 characters containing only letters or both letters and numbers. The first character of a variable name should start with a letter when it contains numbers. There should not be any special characters (like &, ?, !, ',") in the variable name. Also, in the same data file no two variables should have the common names.

- 4) To change the type of a variable, move the cursor to the second cell of the first row under **Type** column heading. A small grey button marked with three dots will appear. Click on it. The **Variable Type** dialog box appears on the screen. Notice that **Numeric** is the default Variable Type. If you have only numeric values for that variable (say Sex variable) check mark the **Numeric** box. You can enter the width of the number (the default width is 8 characters) in the **Width** text box. Sometimes you may need to enter numbers with decimal places. Enter the number of decimal places in the **Decimal Places** text box. The default setting is 2 decimal places. If your data

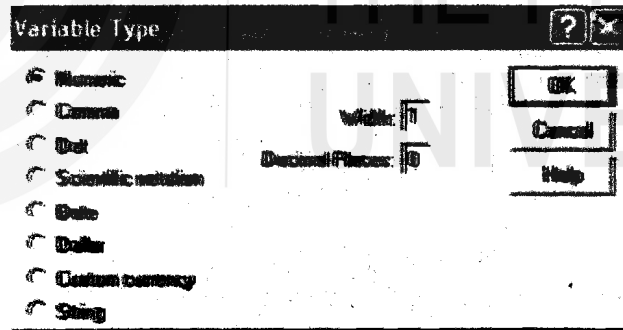


Figure 30.7 Variable Type

contained only integer values, type 0 in the **Decimal Places** text box. If you have a variable string characters (like names of people, places, etc.), check mark the **String** button in Variable type dialog box and enter the maximum number of characters that particular string variable can hold. Similarly, other data variable types such as date, currency, etc., can also be defined.

- 5) Specify the level of measurement for the variable (for example, Sex is a nominal variable). By clicking the cell under **Measure** column heading.

Step-2: Define Labels: Now you can assign the text labels to the coded values of the variables. A variable label is a longer description of the

variable that can be included in the variable name you have defined earlier: This may be necessary since the variable name is restricted to only 8 characters and at later stages to understand the characteristics of that variable. To define labels,

- 1) Type the name of the label (say Sex distribution of persons) in the cell under Label column heading.
- 2) Move on to the cell under **Values** column heading. Click the grey box with three dots. **Value Labels** dialog box appears on the screen. Type the numerical value assigned for the label under Value text box and type label name for that value under Value Label text box. For example, you may type 1 in the Value text box and Male in the Value Label text box. To add the label, click Add button. Again type 2 in the Value text box and Female in the Value Label text box and then click Add button.

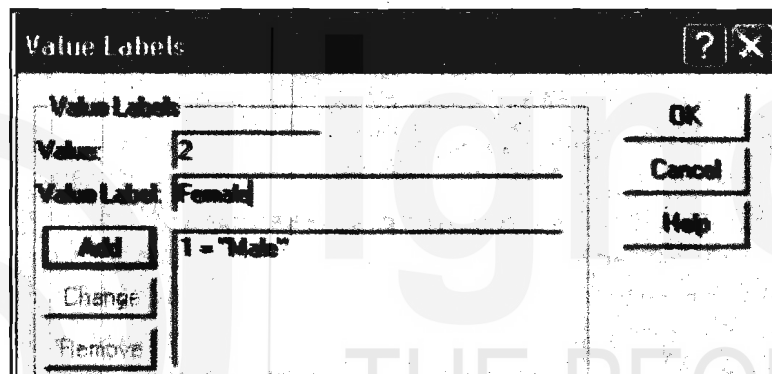


Figure 30.8
Variable
Labels

- 3) Continue this process until you add all the values and the respective labels.
- 4) Click OK button to close the Value Labels dialog box.

Remember that you need to define Value Labels only for categorical data. For the continuous data this is not required.

Step-3: Defining Missing Values: Sometimes, your data may contain missing responses for a variety of reasons. Assign a missing value to the variable if necessary. For example, if the Sex category of a person is not available, you may assign the value 9 to indicate the missing value. The missing value indicates to SPSS that the response is not available and should not be included in the data analysis. To define the missing values to the variable,

- 1) Click on the cell under **Missing** column heading. The **Missing Values** dialog box appears on the screen.

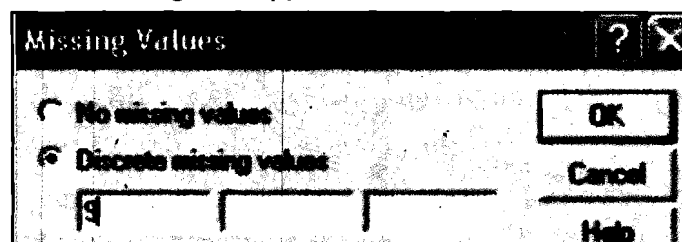


Figure 30.9
Missing Values

- 2) If there are no missing values in the variable, check mark **No missing values** button. Otherwise check mark **Discrete missing values** button. You can type a number assigned by you as Missing value. For example, you may assign 9 if Sex category of a person is not available. If you have check marked for missing values, type the assigned missing value (say 9) in the text box.
- 3) Click **OK** button to close the dialog box.

Remember that the missing values you have assigned for a variable are present in their respective positions in a data file.

You can also specify the width of each column in the cell under **Column** column heading and the alignment (Right, Left, and Center) in the cell under **Align** column heading. Specify the type of measure in the cell under **Measure** heading.

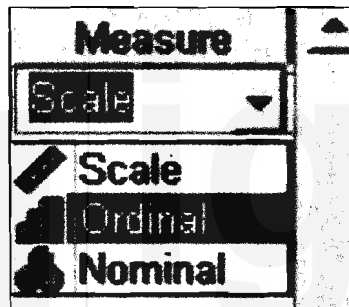


Figure 30.10
Specifying under Measure

Now you have defined all the information for the variable. Move on to the second row (to define 'age' variable), the third row (to define 'marital status' variable), ...etc. to define the rest of the variables in that order.

Name	Type	Width	Decimals	Label	Values	Missing	Column	Align	Measure
1) sex	Nominal	1	0	Sex distribution (1, Male)	9	0	8	Right	Nominal
2) age	Nominal	1	0	Age in years	None	99	8	Right	Scale
3) marital	Nominal	1	0	Marital status (1, Married)	9	0	8	Right	Nominal
4) incomes	Nominal	6	0	Incomes in Pa.	None	99	8	Right	Scale

Figure 30.11(a) Defining all the variables

you have defined all the variables, you may like to see the generated variable definitions. For this, select **Utilities**→**File Info** command on the menu bar. This will generate file information in the output window that can be printed if you need for future reference.

File Information

List of variables on the working file

Name

Position

SEX Sex distribution of persons

- 1) Measurement Level: Nominal
Column Width: 8 Alignment: Right
Print Format: F1
Write Format: F1
Missing Values: 9

Value	Label
1	Male
2	Female

AGE Age in years

- 2) Measurement Level: Scale
 Column Width: 8 Alignment: Right
 Print Format: F1
 Write Format: F1
 Missing Values: *

MARITAL Marital status

- 3) Measurement Level: Nominal
 Column Width: 8 Alignment: Right
 Print Format: F1
 Write Format: F1
 Missing Values: 9

Value	Label
1	Married
2	Unmarried
3	Widowed

INCOME Income in Rs.

4. Measurement Level: Scale
 Column Width: 8 Alignment: Right
 Print Format: F6
 Write Format: F6
 Missing Values: 99

Step-4: Entering the Data into the Cells: Once all the variables for your data file are defined, the data can be directly entered into the cells. For this, first change the view to Data View by clicking the Data View button.

	sex	age	marital	income	cat
1	2	24	1	150000	
2	1	52	1	345000	
3	2	65	3	45000	
4	1	35	3	245000	
5	1	42	1	22000	
6	1	25	1	670000	
7	2	23	2	345000	
8	2	63	1	150000	
9	1	41	2	65500	
10	2	48	1	150000	
11	1	34	2	354000	
12	2	55	3	25000	
13	1	28	1	452000	
14	1	43	2	120000	
15	1	23	2	450000	
16	2	65	1	780000	
17	2	67	3	255000	
18	2	32	2	54000	
19	1	29	2	280000	
20	2	35	2	180000	
21	1	47	1	210000	

the data can be directly entered into the cells. For this, first change the view to Data View by clicking the Data View button.

- 1) Click on cell 1 of the (Sex) variable to activate the cell.
- 2) Type the value of the variable (say '2') and then press Enter key.

Observe that now number '2' appears in cell 1 and cell 2 (the cell below cell-1) becomes active.

Figure 30.11(b)
Entering Values for Each Variable

- 3) Type 1 and press Enter key. This indicates that the value for case of the sex variable is also entered. Continue this procedure until all the values of the 30 cases are entered for sex variable.
- 4) Activate the case 1 cell below Age variable (column) and start entering values for that variable. Continue this procedure until you enter the data for all cases and all variables. **ng a data file .**

Once you have entered the data, it is a good practice to save the data in a file. This will avoid not only repeating the data entry but also for all future uses of your data. SPSS distinguishes between two types of files: data files (with extension .sav) and output files (with extension .spo). The data files contain the data you have entered. The output files contain the output of the data analysis you have performed. You need to save these files in case you may need them for future use.

To save a data file,

- 1) Select **File→Save As...** command from the menu bar. The Save Data As dialog box appears on the screen.

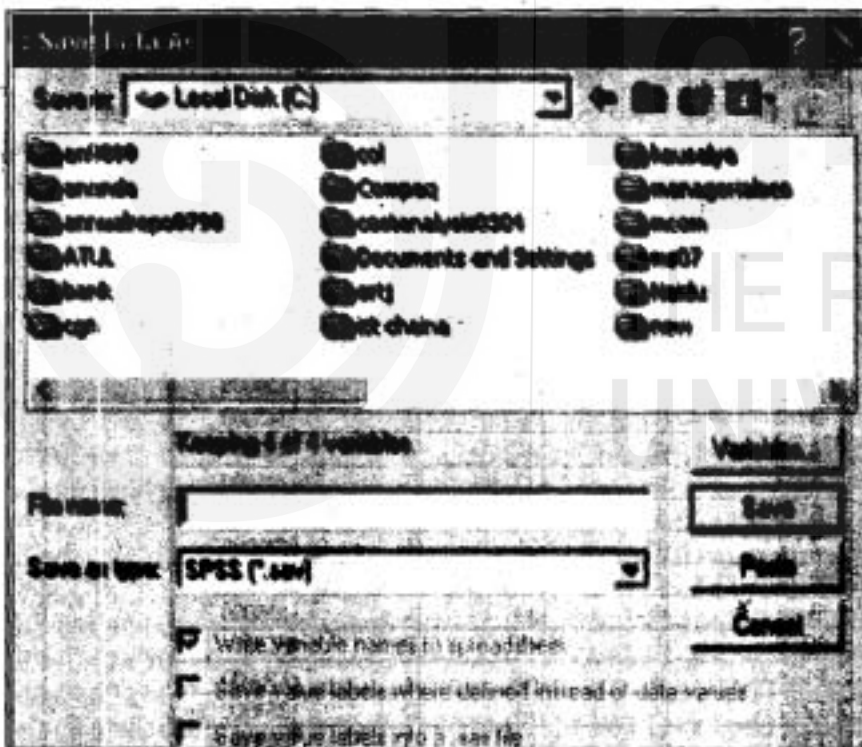


Figure 30.12 Saving a Data File

- 2) Select the drive and folder where you are interested that your file should be located.
- 3) Type the file name in the text box under File name box. Click Save button.

Importing a data file from Excel worksheet

Often you might have entered data in an Excel worksheet and want to use the same data set for analysing the data using SPSS. SPSS can easily

open an Excel data file and some other types of data files. To open an Excel data file,

- 1) Select **Start→Programs Microsoft Excel** command from the Start button on your PC screen. In a few moments the Excel worksheet dialog box appears on the screen.
- 2) Select **File→Open...** command from the menu bar. The **Open File** dialog box appears on the screen. Select the drive and folder where the data file is stored. Select (or type) the file name and click OK button. The Excel data file will open as shown here.

Observe that the variable names are at the top row. Let us assume that the worksheet has been saved as Excel (with extension .xls) file called Profile.

- 3) Select **File→Open→Data...** command in the SPSS Data Editor dialog box. The **Open File** dialog box appears. Choose the appropriate directory and folder in **Look in File of type** box. Select the file name Profile.xls in File name box.

	A	B	C	D	E	F
Case	Number	Sex	Age	Marital	Income	
1	1	2	24	1	15000	
2	2	1	32	1	34000	
3	3	2	65	3	45000	
4	4	1	35	3	245000	
5	5	1	42	1	23000	
6	6	1	25	1	67000	
7	7	2	23	2	345000	
8	8	2	63	1	156000	
9	9	1	41	2	65300	
10	10	2	48	1	15000	
11	11	1	34	2	354000	
12	12	2	55	3	23000	
13	13	1	28	1	452000	

Figure 30.13 Microsoft Excel - Book1

Observe that the variable names are at the top row. Let us assume that the worksheet has been saved as Excel (with extension .xls) file called Profile.

- 4) Select **File→Open?Data...** command in the SPSS Data Editor dialog box. The **Open File** dialog box appears. Choose the appropriate directory and folder in **Look in** box. Choose the

Excel (*.xls) in the File of type box. Select the file name Profile.xls in Filename box.

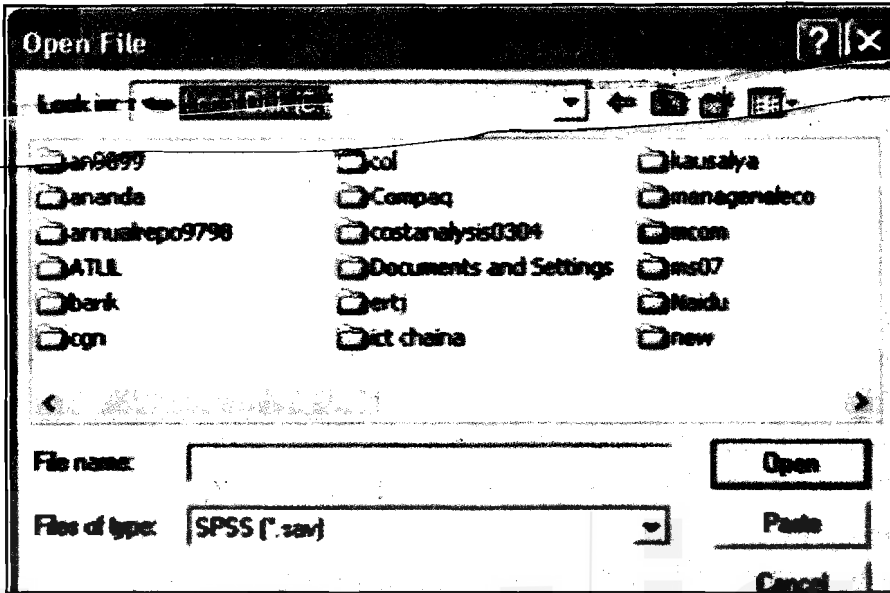


Figure 30.14 Open Files

- 5) Click Open tab in the Open File dialog box. The Opening Excel Data Source dialog box appears on the screen. If your Excel file contains variable names, check mark Read variable names from the first row of the data box. If you leave the Range box blank, SPSS will read all the available data in the Excel worksheet. If you wish to read only some rows and columns then type a range. For example, you may type A1:D30 to select first 4 columns (A,B,C, and D) and 30 rows (1 to 30). Click OK button to close the Opening Excel Data Source dialog box and return to the Data Editor dialog box. Observe that the data is in SPSS Data Editor. Save the SPSS data file.

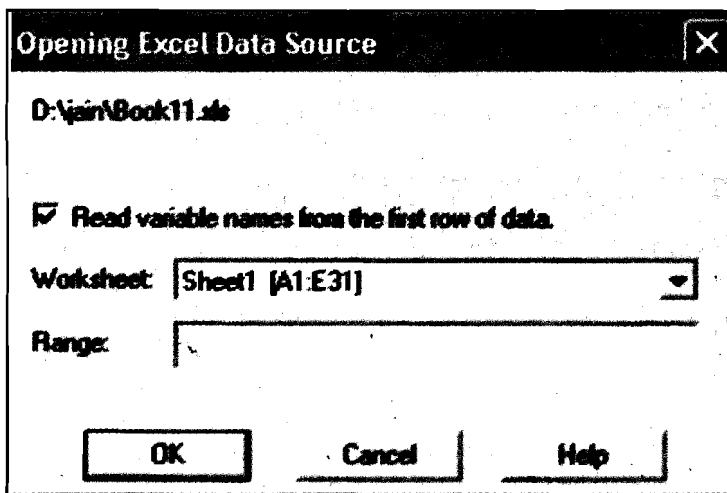


Figure 30.15 Opening Excel Data Source

Reflection and Action 30.1

Answer the following two questions after going through the text above and viewing the graphics. The idea about answering these questions is to make sure that you have understood the procedures.

1. Explain briefly various steps in creating a data file.
2. Differentiate between SPSS Data Editor and Output SPSS Viewer.

30.4 Univariate analysis

Data can be analysed in a number of ways. You can present the data in a simple frequency table or use statistical techniques. For the analysis of data, the data file should be opened first. If the data file is not already open, select the **File**→**Open** command from the menu bar. The **Open File** dialog box appears. Choose the file location and SPSS data file name and click OK button. The data may now appear in the Data Editor screen.

SPSS offers several tools to analyse the data. The tools are selected from the **Analyze** command on the menu bar. In this section, you will learn how to generate frequency tables and calculate the univariate statistics.


Remember that you can compute the same statistics in SPSS using alternative commands.

Frequency tables

To generate the frequency tables,

- 1) Select **Analyze**→**Descriptive Statistics**→**Frequencies** command from the menu bar. The Frequencies dialog box appears on the screen with two large boxes for variables selection/deselection.

Observe that the left box contains a list of variables for which data has been entered. On the right side, there is an empty box for the variable(s) that you want to include in the analysis.

- 2) In the left side box, select the variable to generate a frequency table by clicking the mouse on the name of the variable. Click the arrow  between the two boxes. The selected variable appears on the right side box. Follow these steps till all the variables you want to include for the data analysis appear on the right side box.

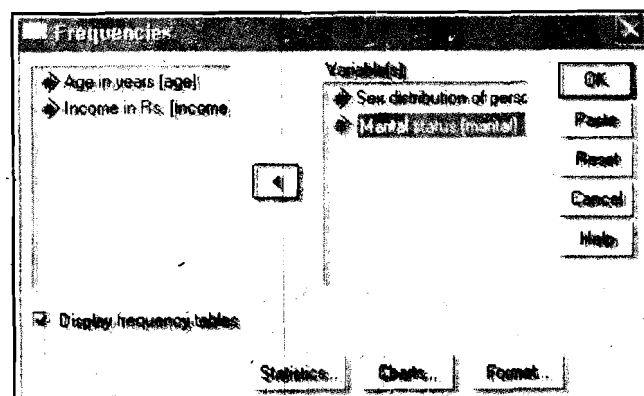



Figure 30.16
Frequencies

- 3) When the first variable is moved to the right side box an  arrow in the opposite direction appears between the two boxes. If you commit a mistake by selecting a wrong variable, click this arrow to return the variable to the original list.

Remember that this Frequencies tool is appropriate only for the categorical data (like Sex and Marital status in our example). Therefore, do not select any continuous variables (like in Age and Income in our example).

- 4) When you have selected all the variables, you want to include for data analysis, click the OK button. In the Output SPSS Viewer window, you should now see the output shown below.

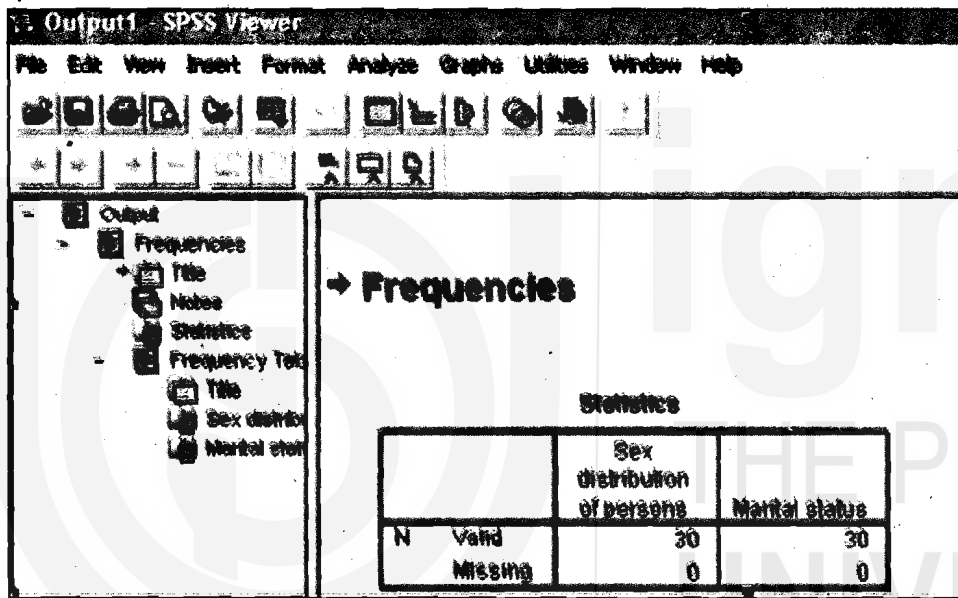


Figure 30.17 Output SPSS Viewer

Frequencies

Find below two tables (Table 30.4 and 30.5 on Sex \Distribution of Persons and Marital Status, respectively).

Table 30.2 Sex\Distribution of Persons Statistics

		Sex Distribution of Persons	Marital Status
N	Valid	30	30
	Missing	0	0

Table 30.3 Marital Status

Frequencies table

Sex distribution of persons

		Fequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	14	46.7	46.7	46.7
	Female	16	53.3	53.3	100.0
	Total	30	100.0	100.0	

Table 30.4 Marital Status

Marital status

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Married	13	43.3	43.3	43.3
Unmarried	10	33.3	33.3	76.7
Widowed	7	23.3	23.3	100.0
Total	30	100.0	100.0	

Observe that the tables contain all the information you want. Also, you have information on the missing cases for each variable. You also have three types of percentages: one for all the cases including missing cases under the heading **Percent**, the second one for only valid cases under the heading **Valid Percent**, and the third gives cumulative percentage under the heading **Cumulative Percent**.

Printing/Saving Output: Now you may want to print on paper or save in a file all or part of the output available in the Output SPSS Viewer window.

- 1) To save the output in a file, follow the instructions given at saving a data file.
- 2) To print all the output click anywhere in the Outline pane located on the left side of the screen. Select **File→Print** command from the menu bar. Click OK button.
- 3) To print a part of output, move the cursor to the end of the portion you want to print. Press the **Shift** key on the keyboard and click the left mouse button. Observe that the selection is highlighted. Select **File→Print** command from the menu bar. Click OK button.

Recode Data: you may want to recode your data for a variety of reasons. For example, the data values for the variable Age are continuous. Now you may want to group them like,

Old Value	New Value
Less than 19	1
20-30	2
30-39	3
40-49	4
50-59	5
60 and above	6

Table 30.5
Data values

To recode a variable, select **Transform→Recode→Into Different Variables** command from the menu bar. The **Recode into Different Variables** dialog box appears on the screen.

Select the variable you want to recode into different variables in the left side box. Transfer this variable to the right side box using arrow tab that lies between the two boxes. Type the name of the variable in the **Name** text box and label name in the **Label** text box.

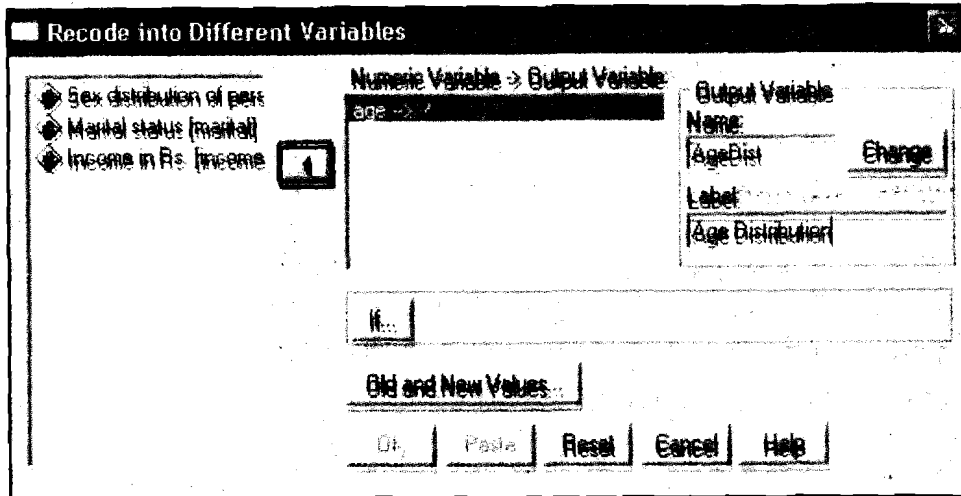


Figure 30.18 Recode into Different Variables: Old and New Values

Press the Old and New Values button in the Recode into Different Variables dialog box. The Recode into Different Variables: Old and New Values dialog box appears.

Check mark the Range button. Type the first range of values in the boxes under Range. Check mark the Value button under New Name heading. Press Add button to define Old and New values. Press Continue button to close the Recode into Different Variables: Old and New Values dialog box and return to the Recode into Different Variables dialog box.

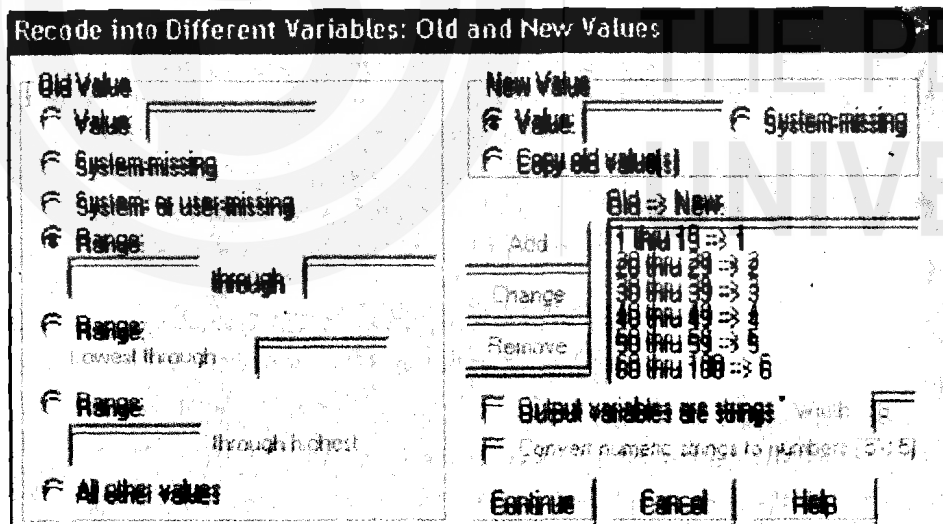


Figure 30.19 Recode into Different Variables

If you have more variable(s) to redefine, continue these steps for each variable. Otherwise press OK button to close the Recode into Different Variables dialog box.

Univariate[®] statistics

For each variable of your data set, you can calculate:

- a) Measures of central tendency: Mean, Median, and Mode.
- b) Dispersion: Standard deviation, Variance, Range, Standard Error of Mean, etc.

K

c) Distribution: Kurtosis and Skewness

Remember in SPSS there are some restrictions on the choice of measures of central tendency (Mean, Median, and Mode) that can be calculated on any data set. The choice of Mean, Median, and/or Mode is restricted by the level of measurement of a variable you have defined. If the level of measurement for a variable is nominal, you can calculate only mode. If the level of measurement of a variable is ordinal then you can calculate Mode and/or Median. If the level of measurement of a variable is interval/ratio, you can calculate Mode, Median, and/or Mode.

To calculate the univariate statistics,

- 1) Select **Analyse**→**Descriptive Statistics**→**Frequencies** from the menu bar. The Frequencies dialog box appears on the screen.
- 2) Transfer the variables on which you want to perform the data analysis from left side box to right side box (as you have done for frequencies analysis earlier).

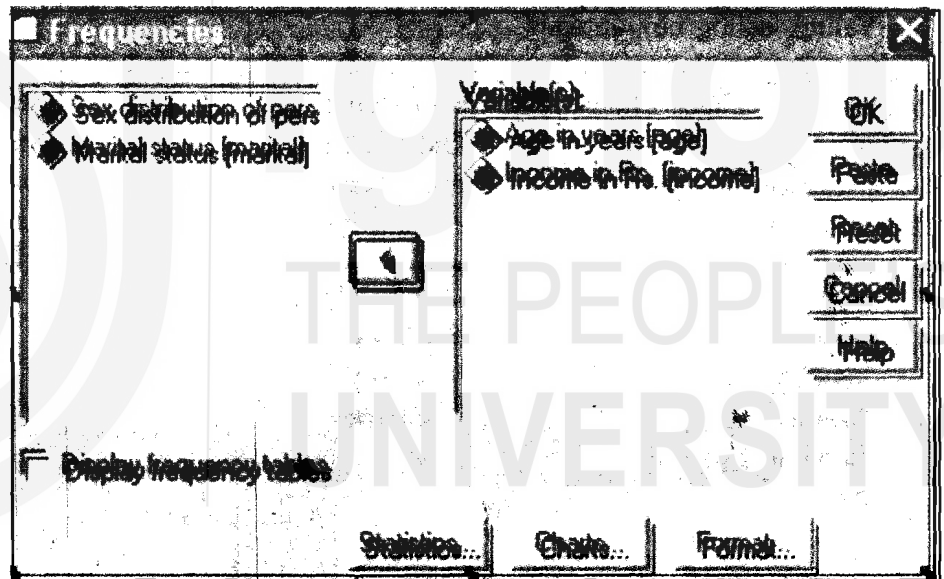


Figure 30.20 Frequencies Analysis

- 3) If you don't want to display frequencies, remove the check mark in **Display frequency tables** button by clicking. The **SPSS for Windows** dialog box appears asking you to confirm. Click **OK** button to close that window.

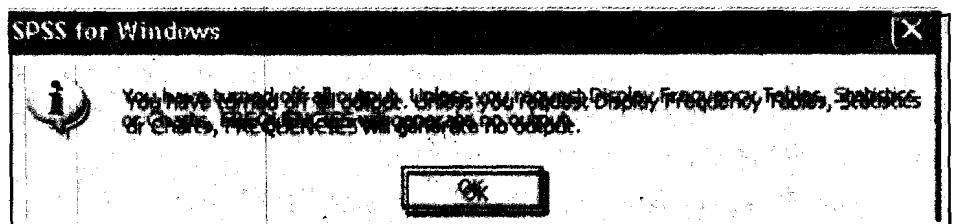


Figure 30.21 Closing SPSS for Windows

- 4) Click on the **Statistics...** button in the Frequencies dialog box. The **Frequencies:Statistics** dialog box appears on the screen.

K

- 5) In the area under **Central Tendency**, check mark the appropriate button to calculate Mean, Median, and/or Mode.
- 6) In the area under **Dispersion**, check mark the appropriate buttons to calculate Standard deviation, Variance, Range, Standard error or Mean, etc.
- 7) In the area under **Distribution**, check mark the appropriate buttons to calculate Skewness and/or Kurtosis.

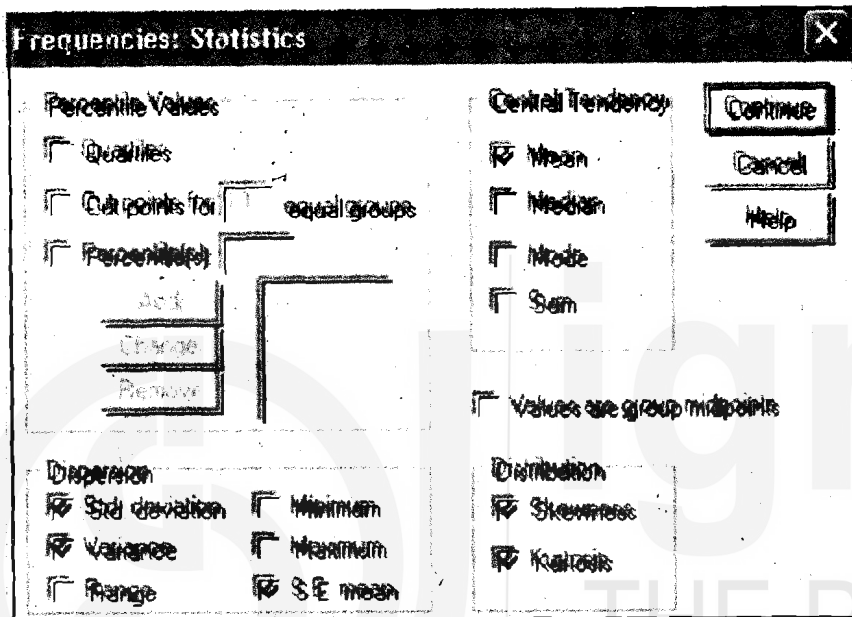


Figure 30.22 Frequencies Statistics

- 8) Click on Continue button to close the Frequencies: Statistics dialog box.
- 9) Click on OK button in the Frequencies dialog box to close it.

Observe that now the output is Descriptive Statistics.

Table 30.6 Statistics

		Age in Years	Income in Rs.
N	Valid	30	30
	Missing	0	0
Mean		40.83	234810.00
Std. Error of Mean		2.891	35206.370
Std. Deviation		15.836	192833.232
Variance		250.764	37184655414
Skewness		.531	1.182
Std. Error of Skewness		.427	.427
Kurtosis		-1.012	1.059
Std. Error of Kurtosis		.833	.833

Remember that you should opt for only appropriate statistics. For example, there is no meaning in opting for Mean of a sex Variable since there is nothing like mean of a sex distribution.

Reflection and Action 30.2

You have just finished reading about univariate analysis in which you worked on frequency tables and univariate statistics. In the light of this information answer the following questions.

- ❖ What is the command on the SPSS menu bar to perform frequencies data analysis?
- ❖ Once the data has been coded and entered into the SPSS Data Editor, is it possible to recode the data? If yes, what is the command to recode?
- ❖ You have defined the level of measurement of a variable as ordinal. Is it possible to calculate all the measures of central tendency for this variable using SPSS. Name the central tendency measures you can calculate.

30.5 Bivariate[®] Analysis

Often, you may be interested in comparing two sets of data or Variables to explore the relationship between two Variables. In this Section, you will learn how to cross-tabulate the data, coefficient of correlation, linear regression, and coefficient of variance to compare two variables.

Cross-tabulation of data

To capture any possible relationship between two variables measured with categorical data, you may use bivariate table, which is also known as cross-tabulation. To cross-tabulate two variables follow the steps given below.

- 1) Select **Analyse?Descriptive Statistics?Crosstabs...** command from the menu bar. The cross tabs dialog box appears on the screen.
- 2) Click on the Variable in the source list (from left side box) that will form the rows of the table. Shift this Variable to the box under **Row(s)** using arrow key.
- 3) Similarly, shift the variable that will form the columns of the table from source list to the box under **column(s)**.

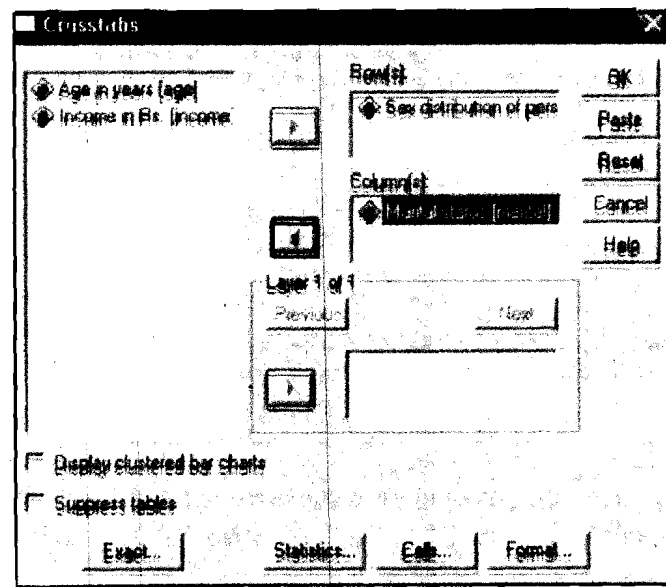


Figure 30.23
Crosstabs

- 4) Click OK button. You will find the table in the Output viewers window.

Crosstabs

Table 30.7 Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Sex distribution of persons [©] Marital status	30	100.0%	0	.0%	30	100.0%

Count

Table 30.8 Sex distribution of persons' Marital status Crosstabulation

		Marital Status			Total
		Married	Unmarried	Widowed	
Sex distribution of persons	Male	6	6	2	14
	Female	7	4	5	16
Total		13	10	7	30

Sometimes, you may be interested in calculating the row/column/total percentages in a table. For this, click on Cells...tab in the cross tabs dialog box before step-4 above. The Crosstabs: Cell Displays dialog box appears on the screen.

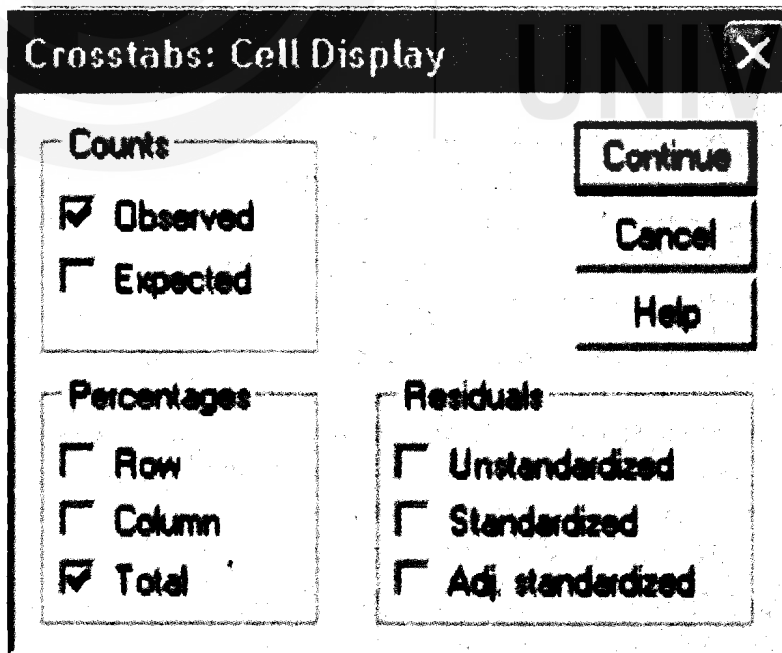


Figure 30.24 Crosstabs: Cell Display

Check mark the appropriate (Row, Column, and/or Total) button under percentages area. Click continue button to close the Crosstabs: Cell

Display dialog box. Click Ok button on the Crosstabs dialog box, to view the output (see Table 30.9 and Table 30.10).

Crosstabs

Table 30.9 Case Processing Summary: Output

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Sex distribution of persons* Marital status	30	100.0%	0	.0%	30	100.0%

Table 30.10 Sex distribution of persons *Marital status
Crosstabulation: Output

			Marital status			Total
			Married	Unmarried	Widowed	
Sex distribution of persons	Male	Count	6	6	2	14
		% of Total	20.0%	20.0%	6.7%	46.7%
	Female	Count	7	4	5	16
		% of Total	23.3%	13.3%	16.7%	53.3%
		Count	13	10	7	30
		% of Total	43.3%	33.3%	23.3%	100.0%

Bivariate statistics

The statistical tools you often use to compare two Variables may be the coefficient of variance, correlation, and linear regression.

Coefficient of variance: As you are aware, the Coefficient of Variance (CV) is the standard deviation expressed as a percentage of the mean.

$$CV = \frac{\text{Standard deviation}}{\text{Mean}} \times 100.$$

Unfortunately, SPSS does not have a command to complete the Coefficient Variance for a variable in a data file. What we advise you is that you should calculate the respective Mean and Standard deviation of a Variable using the Descriptive dialog box as explained earlier and then calculate the CV by hand which is very simple.

Correlation coefficient: There are two types of correlation coefficients: Pearson's correlation coefficient and Spearman's rank correlation coefficient. The Pearson correlation is appropriate and applicable when you have interval/ratio data. The Spearman rank correlation coefficient is applicable when you have two ordinal scales with a large number of values or one ordinal and the other interval/ratio scale.

To compute the appropriate correlation coefficient for your data set, follow the instructions given below.

- 1) Select **Analyse**→**Correlate**→**Bivariate...** command from the menu bar. The Bivariate Correlations dialog box appears on the screen.
- 2) Select the variables by shifting from left side box to the box under **Variables** area.

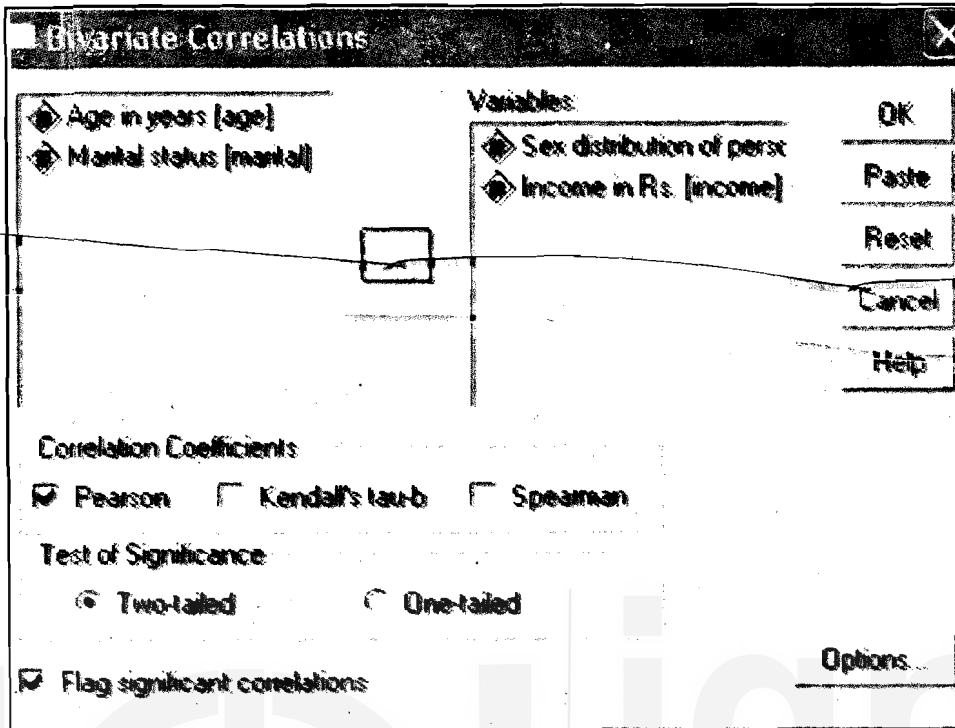


Figure 30.25 Bivariate Correlation

- 3) Check mark the appropriate (Pearson, and/or Spearman) button under Correlation Coefficients area to select the type of correlation coefficient.
- 4) If you want the associated tests of significance, check mark the appropriate (Two-tailed or one-tailed) button under Test of Significance area. You will see the results in the Output Viewer Window.

Correlations

Table 30.11 Correlations between Two Variables

		Sex distribution of persons	Income in Rs.
Sex distribution of persons	Person Correlation	1	-.136
	Sig. (2-tailed)	.	.472
	N	30	30
Income in Rs.	Person Correlation	-.136	1
	Sig. (2-tailed)	.472	.
	N	30	30

Linear regression: The linear regression technique is used to: (a) test the hypotheses concerning the linear relationship between two variables (b) estimating the specific nature of relationship; and (c) to predict the values of dependent variable when you know the values of independent variable. To run the linear regression procedure follow the steps given below.

- 1) Select **Analyse**→**Regression**→**Linear...**command from the menu

bar. The Linear Regression dialog box appears on the screen.

- 2) Click on the variable name that will be dependent variable in the left side box. Shift the dependent variable to the box under Dependent area using arrow tab.

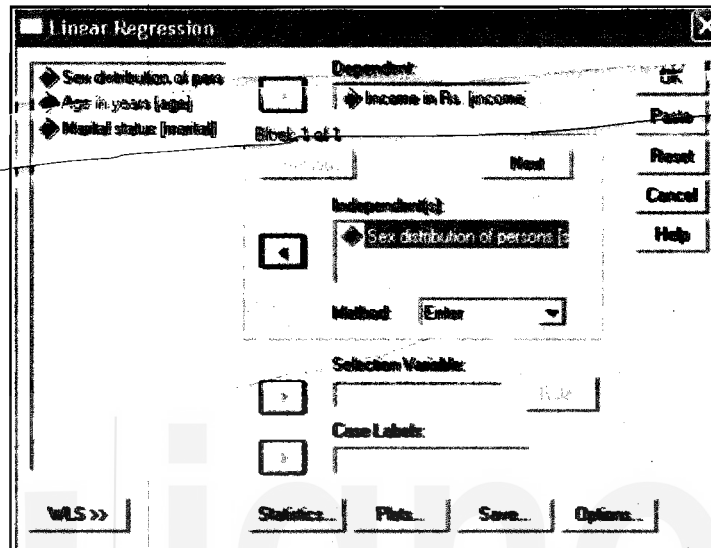


Figure 30.26 Linear Regression

- 3) Click on the variable name that will be independent in the left side box. Shift the independent variable to the box under InDependent(s) area using arrow tab.
- 4) Click OK button. You will see the results in the Output Viewer Window.

Observe that the output consists of four points: (a) a table of variables used in regression, (b) a model summary, (c) an ANOVA table; and (d) a table of coefficients. You may be interested in a portion of the output. We will explain how to select a partial output in another Unit on use of SPSS in report writing.

Regression

Table 30.12 Variables Entered/Removed

Model	Variables Entered	Variables Removed	Method
1	Sex distribution of persons	.	Enter

- a) All requested variables entered
- b) Dependent Variable : Income in Rs.

Table 30.13 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.136 ^a	.019	-.016	194413.110

- a) Predictors: (Constant), Sex distribution of persons

Table 30.14 ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.01E+10	1	2.005E+10	.531	.472 ^a
	Residual	1.06E+12	28	3.780E+10		
	Total	1.08E+12	29			

a) Predictors: (Constant), Sex distribution of persons

b) Dependent Variable: Income in Rs.

Table 30.15 Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	314275.0	114722.6	-.136	2.739	.011
Sex distribution of persons	-51825.0	71147.913		-.728	.472

a) Dependent Variable: Income in Rs.

30.6 Multivariate[©] Analysis

Sometimes, you may be interested in exploring complex relationships involving more than two variables. In this section, you will learn how to cross tabulate your data for the analysis of relationships between more than two variables. Similarly, how to compute multiple regression analysis has also been covered.

Elaboration of cross-tables

In the earlier section, you have learned the cross-tabulation of two variables. You can introduce a third variable by sub grouping one of the two variables. This can be done by introducing a variable as control variable. A control variable decomposes the data into sub-groups based on the categories of the control variable. To add a control variable for your cross-tabulation, follow the steps given below.

- 1) Select **Analyse**→**Descriptive Statistics**→**Crosstabs...**command from the menu bar. The **Crosstabs** dialog box appears on the screen as shown on the next page.
- 2) Click on the variable in the source list that will form the row(s) of the table. Shift this variable to the box under **Row(s)** using arrow key.
- 3) Similarly, shift the variable that will form the columns of the table from source list to the box under **Column(s)** using arrow key.
- 4) Click on the variable which will act as control variable l (this variable splits the variable selected at step-3 into sub groups). Shift the control variable to the box under **Layer 1 of 1** using arrow key.
- 5) For computing the row/column/total percentages in the table,

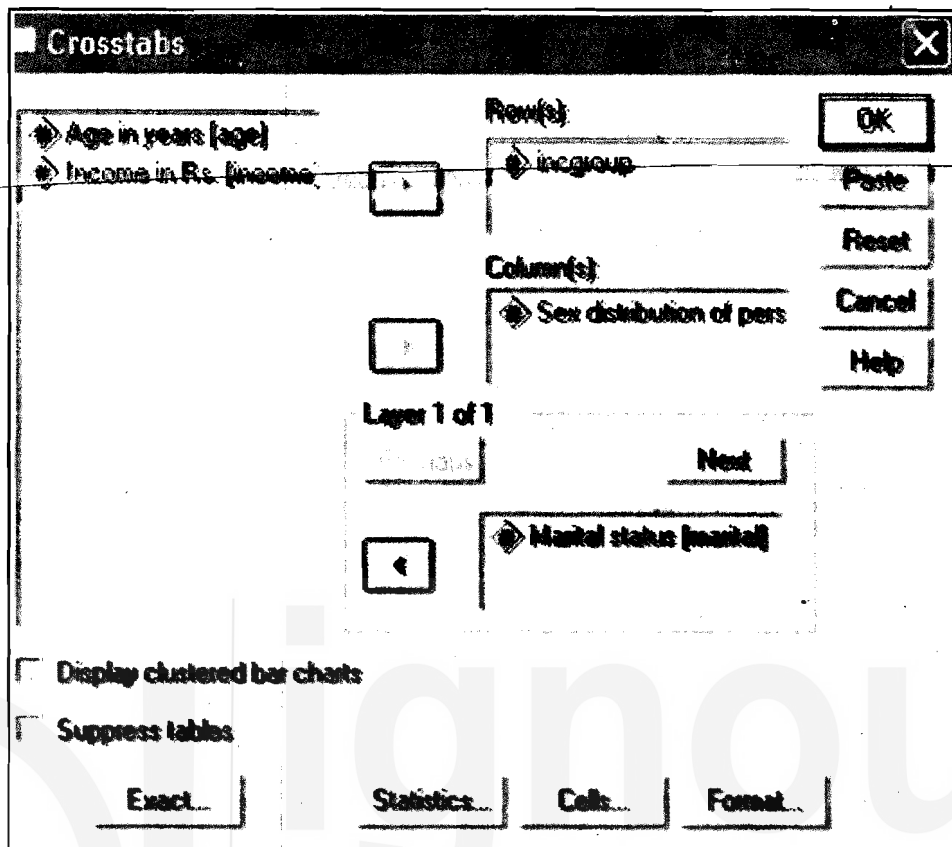


Figure 30.27

Crosstabs: Cell Display for Computing the Row/Column/Percentages

click on Cells...tab. The Cross tabs: Cell Display dialog box appears on the screen. Click the appropriate (Row, Column, and/or Total) button under Percentages area. Click Continue button to close the Cross tabs: Cell Display dialog box.

- 6) Click OK button to close the Crosstabs dialog box.

Crosstabs

Table 30.16 Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Income group * Sex distribution of persons * Marital status	30	100.0%	0	.0%	30	100.0%

Let's look at the table 30.17: Income Group and Sex Distribution of Persons' Marital Status Crosstabulation. You will find crosstabulation of marital status by income group of married, unmarried and widowed persons with their sex distribution. This is a good example that you can try and use in your own research work. Not only this but you can also use the other examples given in this unit for your research project.

Table 30.17 Income Group and Sex Distribution of Persons' Marital Status Crosstabulation

Marital status				Sex distribution of persons		Total
				Male	Female	
Married	Income group	Less than Rs. 50000	Count	1	2	3
			% of Total	7.7%	15.4%	23.1%
		Rs. 100001-200000	Count	0	3	3
			% of Total	.0%	23.1%	23.1%
		Rs. 200001-400000	Count	3	1	4
			% of Total	23.1%	7.7%	30.8%
		More than Rs. 400000	Count	2	1	3
			% of Total	15.4%	7.7%	23.1%
	Total		Count	6	7	13
			% of Total	46.2%	53.8%	100.0%
Unmarried	Income group	Less than Rs. 50000	Count	0	1	1
			% of Total	.0%	10.0%	10.0%
		Rs. 50001-100000	Count	1	1	2
			% of Total	10.0%	10.0%	20.0%
		Rs. 100001-200000	Count	3	1	4
			% of Total	30.0%	10.0%	40.0%
		Rs. 200001-400000	Count	1	1	2
			% of Total	10.0%	10.0%	20.0%
		More than Rs. 400000	Count	1	0	1
			% of Total	10.0%	.0%	10.0%
	Total		Count	6	4	10
			% of Total	60.0%	40.0%	100.0%
Widowed	Income group	Less than Rs. 50000	Count	0	2	2
			% of Total	.0%	28.6%	28.6%
		Rs. 100001-200000	Count	1	0	1
			% of Total	14.3%	.0%	14.3%
		Rs. 200001-400000	Count	1	2	3
			% of Total	14.3%	28.6%	42.9%
		More than Rs. 400000	Count	0	1	1
			% of Total	.0%	14.3%	14.3%
	Total		Count	2	5	7
			% of Total	28.6%	71.4%	100.3%

Multiple regression

In two variable linear regression you have used one dependent variable and one independent variable. The multivariate regression is used to investigate the relationship between two or more independent variables on a single dependent variable. The procedure for computing the statistics for multiple regression is the same as that for two variable linear regression explained earlier, except that you have more than one variable under Independent(s) area in the Linear Regression dialog box.

- 1) **Analyse** → **Regression-Linear...** command from the menu bar. The **Linear Regression** dialog box appears on the screen.
- 2) Click on the variable name that will be a dependent variable in the left side box. Shift this variable to the box under **Dependent** area using arrow tab.
- 3) Click on the variable name that will be independent in the left side box. Shift this variable to the box under **Independent(s)**

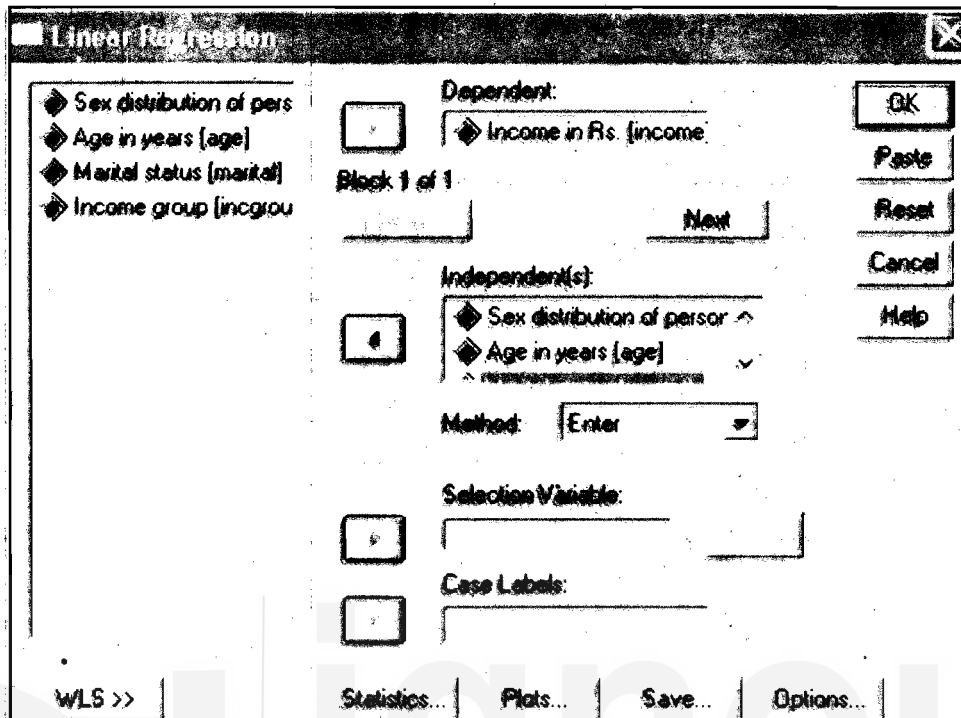


Figure 30.28 Linear Regression Dialog Box

area. Follow this step until all the desired independent variables are selected.

- 4) Click OK button. You will see the results in the Output Viewer Window.

Regression

Table 30.18 Variables Entered/Removed

Model	Variables Entered	Variables Removed	Method
1	Marital status, Sex distribution of persons, Age in years		Enter

- a) All requested variables entered
- b) Dependent Variable: Income in Rs.

Table 30.19 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.168 ^a	.028	-.084	200774.054

- a) Predictors: (Constant), Marital status, Sex distribution of persons, Age in years

Table 30.20 ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.03E+10	3	1.010E+10	.250	.860 ^a
	Residual	1.05E+12	26	4.031E+10		
	Total	1.08E+12	29			

- a) Predictors: (Constant), Marital status, Sex distribution of persons, Age in years
 b) Dependent Variable: Income in Rs.

Table 30.21 Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	362849.3	153394.2		2.365	.026
Sex distribution of persons	-44008.8	75727.227	-.116	-.581	.566
Age in years	-680.236	2431.316	-.056	-.280	.782
Marital status	-18212.7	46773.389	-.076	-.389	.700

- a) Dependent Variable: Income in Rs.

30.7 Tests of Significance

In this section, you will learn one sample t-test* for a mean, two sample t-test for the equality of means, and chi-square test for independence.

One sample t-test

The one sample t-test compares the sample means to a population mean, using t-distribution as the standard of comparison.

- 1) Select Analyse → Compare Means → One-Sample T Test... command from the menu bar. The One Sample T Test dialog box appears on the screen.
- 2) Click on the variable name you want to perform the t-test on the

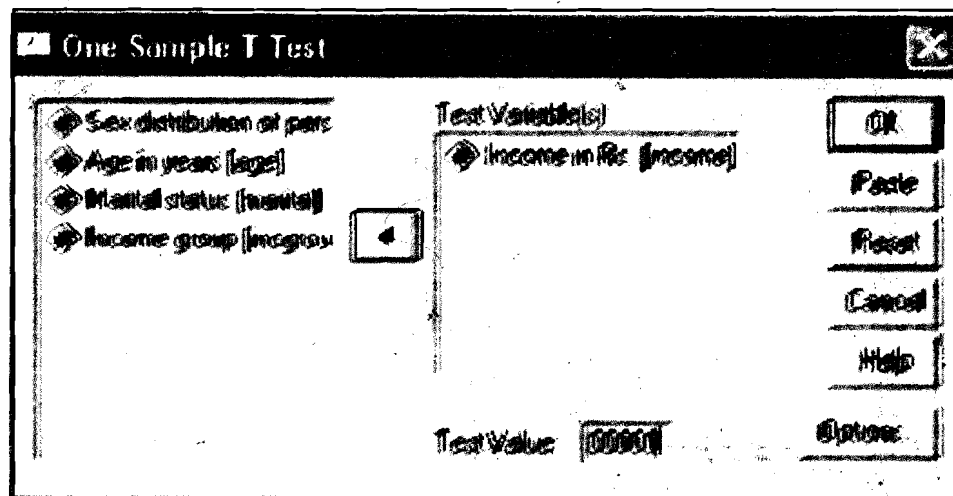


Figure 30.29 One Sample T Test

left side box. Shift this variable to the box under Test Variable(s) area.

- 3) Suppose you have selected Income Variable for the t-test and hypothesis takes the population mean income as Rs.200000. Type 200000 in the test box next to Test Value.
- 4) Click OK button. The following is the output you will see in Output Viewer Window.

T-Test

Table 30.22 One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Income in Rs.	30	234810.00	192833.232	35206.370

Table 30.23 One Sample Test with Test Value

	Test Value = 200000					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Income in Rs.	.989	29	.331	34810.00	-37195.11	106815.11

Two sample T-Test

Sometimes, our data analysis focuses on two distinct groups within a single population or we may want to compare the two populations in terms of their respective means. The two-sample t-test for the equality of means will help you in this.

- 1) Select Analyse→Compare Means→Independent-Samples T

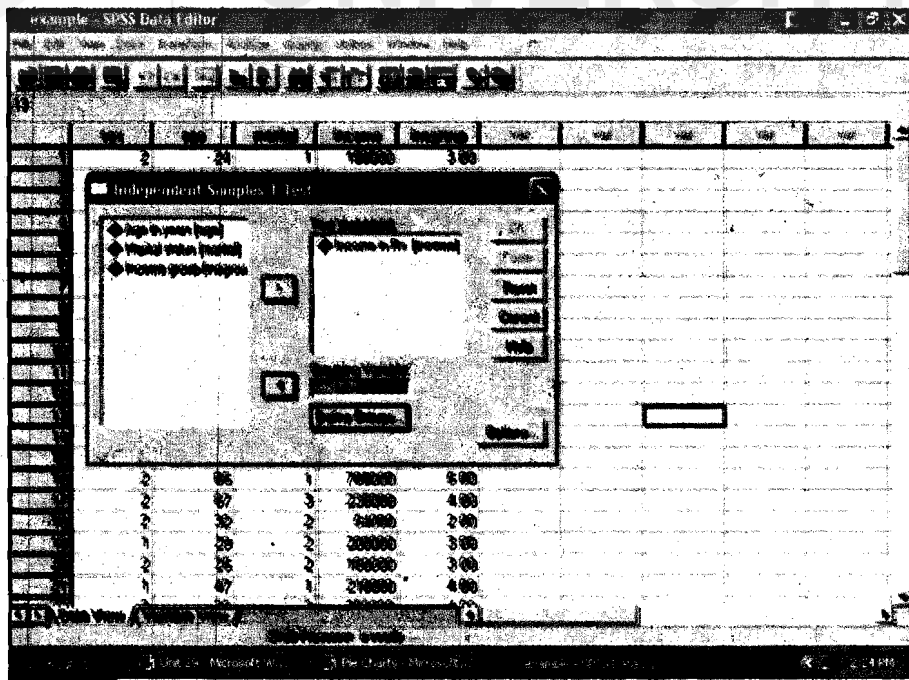


Figure 30.30 Example SPSS Data Editor: Income Variable

Test...command from the menu bar. The **Independent-Samples T** dialog box appears on the screen.

- 2) Click on the Variable name in the left side box that you want to include for the t-test. Suppose you want to include Income Variable, shift this variable to the right side box under **Test Variable(s)** using arrow key.
- 3) Click on the variable you want to group. Suppose you want to test the income mean difference between males and females, click on sex variable. Shift this variable to the box under **Grouping Variable** using arrow key.
- 4) Click on the **Define Groups...** button. The **Define Group** dialog box appears on the screen. Type '1' in the **Group 1** box. Type '2' in the **Group 2** box. Click **Continue** button to close the Define Groups dialog box.

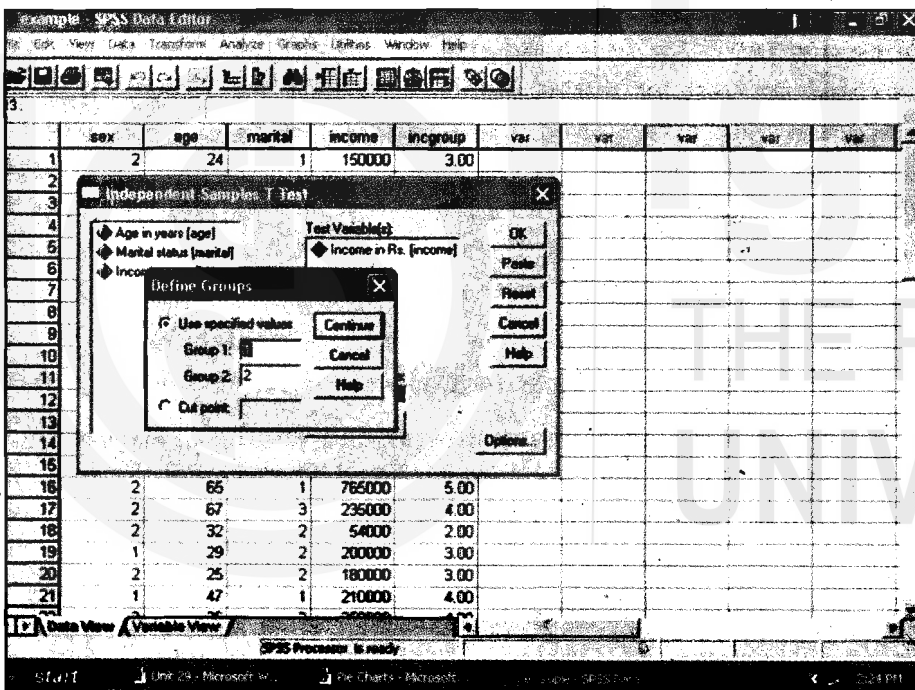


Figure 30.31 Example SPSS Data Editor: Grouping Variables

- 5) Click OK button to close the Independent-Samples T Test dialog box. The following table presents the output.

T-test

Table 30.24 Group Statistics

	Sex distribution of persons	N	Mean	Std. Deviation	Std. Error Mean
Income in Rs.	Male	14	262450.00	176610.187	47201.058
	Female	16	210625.00	208616.994	52154.248

Table 30.25 Independent Samples Test

		Income in Rs.	
		Equal variances assumed	Equal variances not assumed
Levene's Test for Equality of Variances	F	.118	
	Sig.	.734	
t-test for Equality of Means	t	.728	.737
	df	28	27.978
	Sig. (2-tailed)	.472	.467
	Mean Difference	51825.00	51825.00
	Std. Error Difference	71147.913	70342.061
	95% Confidence Interval of the Dfference		
	Lower	-93914.893	-92269.306
	Upper	197564.893	195919.306

Chi-square test[®] for independence

The chi-square test for testing the independence of attributes is for the categorical data arranged in a cross tabulation. The chi-square test appears as an option within the procedure for generating a cross-tabulation. The steps for chi-square test are repeat of steps for generating cross-tabulation with the addition of Expected counts under cells and chi-square under Statistics.

- 1) Select **Analyse**→**Descriptive Statistics**→**Crosstabs** command from the menu bar. The cross tabs dialog box appears on the screen.
- 2) Select a variable under **Row(s)** and another variable under **Column(s)**. Suppose you have selected Income level (a categorical variable with income levels low and high) variable under Row(s) and sex variable under Column(s).

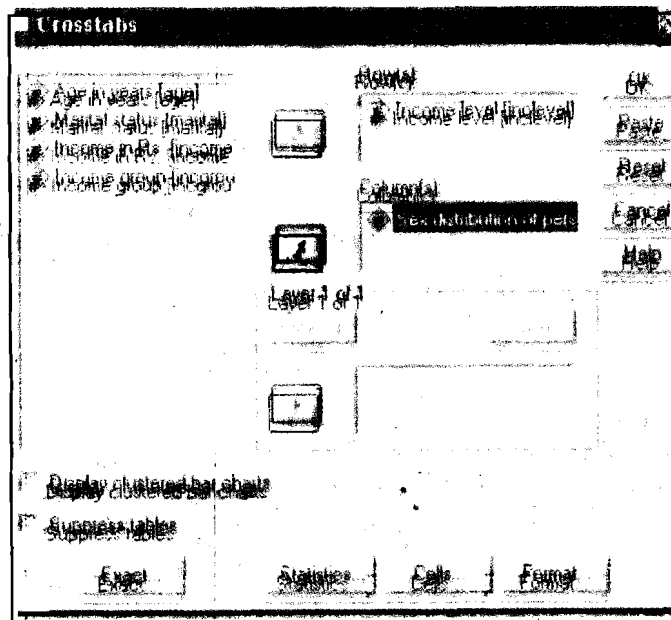


Figure 30.32
Crosstabs: Income Levels

- 3) Click on the Statistics...button in the Cross tabs dialog box. The Cross tabs:Statistics dialog box appears on the screen. Check mark the Chi-square button. Click Continue button to close the Cross tabs: Statistics dialog box.

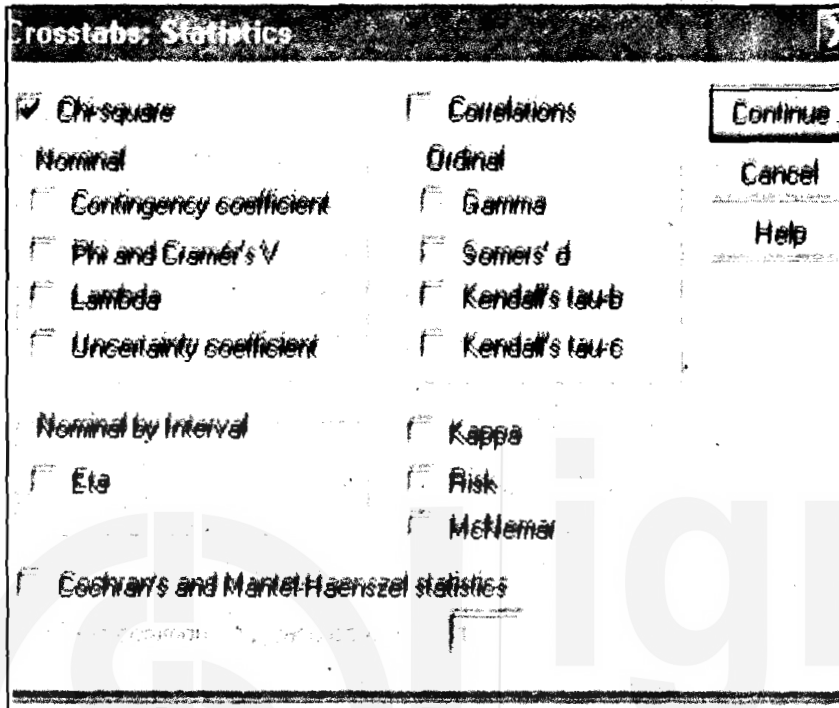


Figure 30.33 Crosstabs: Statistics

- 4) Click on the Cells...button in the Cross tabs dialog box. The Crosstabs:Cell Display dialog box appears on the screen. Check mark both Observed (if not already check marked) box and Expected box under Counts. Click Continue button to close Cross tabs:Cell Display dialog box.

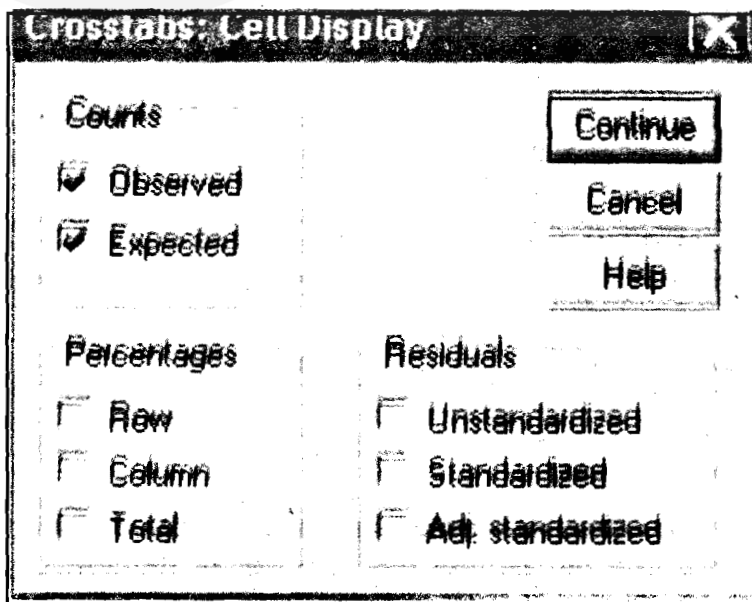


Figure 30.34 Crosstabs: Cell Display

- 5) Click OK button in the Cross tabs dialog box. The output generated is shown below.

Crosstabs

Table30.26 Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Income group * Sex distribution of persons	30	100.0%	0	.0%	30	100.0%

Table30.27

Income level * Sex distribution of persons Crosstabulation

			Sex distribution of persons		Total
			Male	Female	
Income level	Low	Count	4	8	12
		Expected Count	5.6	6.4	12.0
	High	Count	10	8	18
		Expected Count	8.4	9.6	18.0
Total		Count	14	16	30
		Expected Count	14.0	16.0	30.0

Table30.28 Chi-Square Tests

	Value	df	Asymp. Sig. (2-tailed)	Exact Sig. (2-tailed)	Exact Sig. (1-sided)
Pearson Chi-Square	1.429 ^b	1	.232		
Continuity Correction ^a	.675	1	.411		
Likelihood Ratio	1.448	1	.229		
Fisher's Exact Test				.284	.206
Linear-by-Linear Association	1.381	1	.240		
N of Valid Cases	30				

a) Computed only for a 2X2 table

b) 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.60.

Reflection and Action 30.3

Answer the following question on the basis of what you have just finished reading.

- ❖ What are the different views available in SPSS Data Editor?
- ❖ Explain when would you use each of these views?

30.8 Conclusion

In this unit you have learned the use of the SPSS Program to enter the data in a data file and use this data file for the analysis of data. You might have generated a data file using some other data base programs such as Excel. It is very easy to convert such data files

into a SPSS data file.

This unit provides an introduction to the SPSS. You can do a range of statistical analyses from simple cross tabulation to more complex statistical techniques, depending upon the individual researcher's requirement. However, we have tried to explain only simple commands and statistical tools, which are more popular in social research. We will leave it to the student to try and learn the full range of features in SPSS.

Further Reading

Nie, N. H., C.H. Hull, J. G. Jenkins, K. Steinbrenner and D. H. Bent
1979. *Statistical Package for the Social Sciences*. McGraw Hill: New
York



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Unit 31

Using SPSS in Report Writing

Contents

- 31.1 Introduction
- 31.2 Why to Use SPSS
- 31.3 Charts
- 31.4 Working with SPSS Output
- 31.5 Copying SPSS output to MS Word Document
- 31.6 Conclusion



Learning Objectives

It is expected that after going through Unit 31, you will be able to

- ❖ Edit the SPSS output Tables to suit your needs in report writing
- ❖ Create and edit Charts for graphic presentation of your data analysis
- ❖ Copy the SPSS edited Tables and Charts directly in your report.

31.1 Introduction

Unit 29 you read about SPSS and now in Unit 31 you will learn how to modify or edit the Tables generated by the SPSS to meet your specific needs in writing reports. Creating and editing Charts are covered to enhance your report presentation skills. Also, you will learn how to copy the edited tables and charts in a MS Word document where your main report file may be accessible.

31.2 Why to Use SPSS

In SPSS, when you run a statistical procedure, the results are displayed in a window called Viewer. At the time of including these results in your report, you may wish to create a professional-looking report both quickly and easily. Powerful calculation and formatting capabilities of SPSS let you design your own highly specialised reports, such as cross-tabulation. You can use formatting tools to change fonts, colours, styles, column size, row size, and alignment. The use of preset formatting in style sheets can eliminate the need to reformat each new report.

Often, the most striking way of presentation of data is with Charts (also, often called Graphs). A Chart provides a quick visual sense of the main features of the data. Using SPSS, you can create and edit Charts for your data.

Normally, you use MS Word or some other word processing program to type your report. You include the Tables and Charts generated by the SPSS in the report to support your analysis. Using the Copy and Paste

functions of MS Word, the Tables and Charts generated by the SPSS can be copied from the SPSS Output Window and pasted into the Word Window without having to create new Tables and Charts.

31.3 Charts

A chart is a graphical presentation of data. Before you create a chart, you should keep in mind:

- ❖ The **title** identifies the chart. Therefore, give the chart an appropriate title.
- ❖ **Category (X) axis** identifies the data being charted on the horizontal X-axis. Examples of Category X-axis include dates, persons, places, groups, etc. Therefore, clearly identify the categories of the variable and give an appropriate category axis title.
- ❖ **Value (Y) axis** identifies the data being charted on the vertical Y-axis. Examples of Y-axis labels include numbers, value of currency, percentage, etc. Therefore, clearly identify the value along with an appropriate value title.
- ❖ **Legends**® identify the information charted. A legend will be important for identifying which information relates to what class.

A number of types of charts (pie charts, bar charts, histograms, etc.) are available to portray certain types of information. You must, therefore, choose the correct type of chart for information you wish to project.

Many of the charts available in SPSS come in two different general formats: (a) Standard chart; and (b) Interactive charts. The standard charts are created either from the main Graphs menu bar or by statistical procedures. The interactive charts are created from the Interactive sub-menu of the Graphs menu bar and the charts created from pivot tables. However, we will limit this Unit to creating and editing Standard charts only.

Pie Charts can be created using any of the level of measurement of data (nominal, ordinal, interval, or ratio). Bar charts can be created using nominal, ordinal, or interval/ratio (discrete variables) data. Histograms are created using interval/ratio (continuous variables) data. The polygon chart can be created using interval/ratio data.

Creating standard charts

In this unit, we shall be concerned with the creation of a simple Pie chart and then a Bar chart.

Pie Chart: A pie chart can be constructed for all levels of measurement.

To create a pie chart, follow the instructions given below:

- 1) Select **Graphs→Pie...** command from the menu bar in the **Data Editor Window**. The Pie Charts dialog box (figure 31.1) appears on the

screen asking you to define the cases in a variable or separate variables.

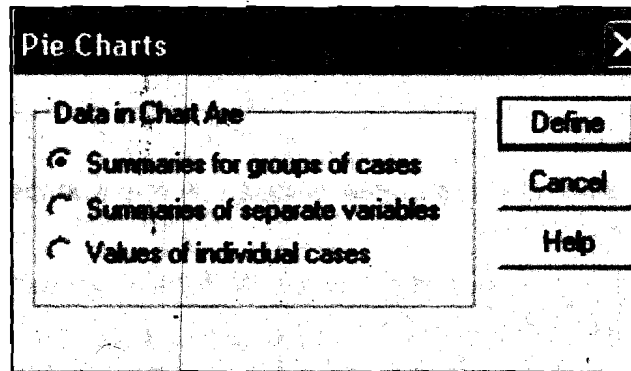


Figure 31.1 The Pie Charts Dialog Box

- a) If you want the summary (number, percentage, etc.) of cases in each category groups available in the same variable check mark the **Summaries for groups of cases** button. For example, you may wish a pie chart to show the gender distribution of the number of respondents (sex variable: Number of male and female respondents).
- b) If you want the summaries (total, percentage, average, count, etc) of different variables as a pie chart check mark the **Summaries of separate variables** button.
- c) If you want simply the values of individual cases as a pie chart, check mark **Values of Individual Cases** button. For example, you might have typed the number '25' as male respondents as case-1 and the number '30' as female respondents against case-2 in 'gender' variable.

In our example, we have check marked **Summaries for groups of cases** button, since the gender sub groups (male and female) are in sex variable.

2) After check mark in the appropriate button in the Pie charts dialog box, press the Define button to close that dialog box. The Define Pie: Summary for Groups of Cases dialog box appears on the screen. The default setting for what each slice of a Pie chart should represent is the number

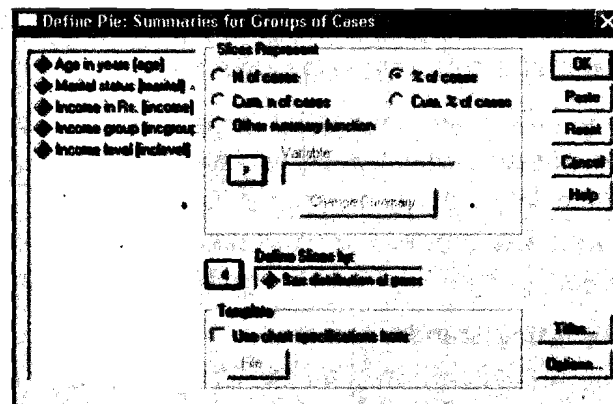


Figure 31.2 Define Pie: Summary for group of cases

of cases. Check mark **N of cases** button if it is not already check marked. You can also check mark **% of cases** button if required in place of number of cases. Transfer the variable(s) on which you want the pie

chart from left variable box to the box under **Define series** by: using arrow key.

Remember that when charts are created, they do not show the missing cases category as default as you have seen in Unit 30 on Using SPSS for Data Analysis. If you want to display this category make sure that the number of cases with missing values is not excessive. To display missing values, click the Options button to define the missing values. The Options dialog box appears. Check mark the Display groups defined by missing values button and then click Continue button. Click OK button in the Define Pie... dialog box to create a Pie chart.

Reflection and Action 31.1

Read carefully the text given above about creating standard charts and answer the following questions. Write your answers in the context of creating a pie chart on the gender distribution in India.

- ❖ When you create a chart in SPSS, what are the important points you should keep in mind?
- ❖ Discuss the steps involved in creating a Pie Chart on the topic mentioned above.

Graph: See figure 31.3 an example of a completed Pie Chart on the gender distribution in India.

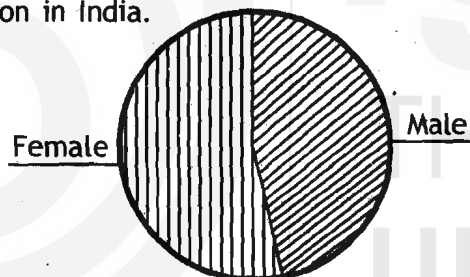


Figure 31.3 Example of a completed Pie Chart on the gender distribution in India

Bar Charts: To generate a bar chart, select **Graphs→Bar...** command

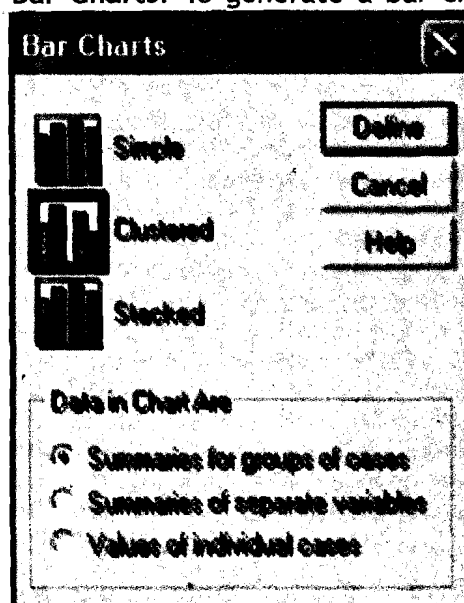


Figure 31.4 Bar Charts

from the menu bar of the Data Editor window. The **Bar Charts** dialog box appears on the screen. You have three options available in this dialog box: (a) Simple bar charts, (b) Clustered bar charts, and (c) Stacked bar charts. Select your option by clicking on the respective chart box, define the case as you have done for pie chart by clicking either **Summary for groups of cases**, or **Summary of separate variables**, or **Values of individual cases** box under **Data in Chart Are** area in the **Bar Charts** dialog box. In our example, we have check

marked **Summaries for groups of cases** button, since the gender sub groups (male and female) are in sex variable.

Click on the **Define** button in the Bar Charts dialog box to close it. The **Define Simple Bar: Summary for Groups of Cases** dialog box appears on the screen, which is identical to the **Define Pie** dialog box. Transfer the variable(s) on which you want the bar chart from left variable box to the box under **Category Axis:** using arrow key. The default setting for what each rectangle of a bar chart should represent is the number of cases. Check mark **N of cases** button if it is not already check marked. You can also check mark **% of cases** button if required in place of number of cases. Click **OK** button to generate the bar chart in the Output Viewer window.

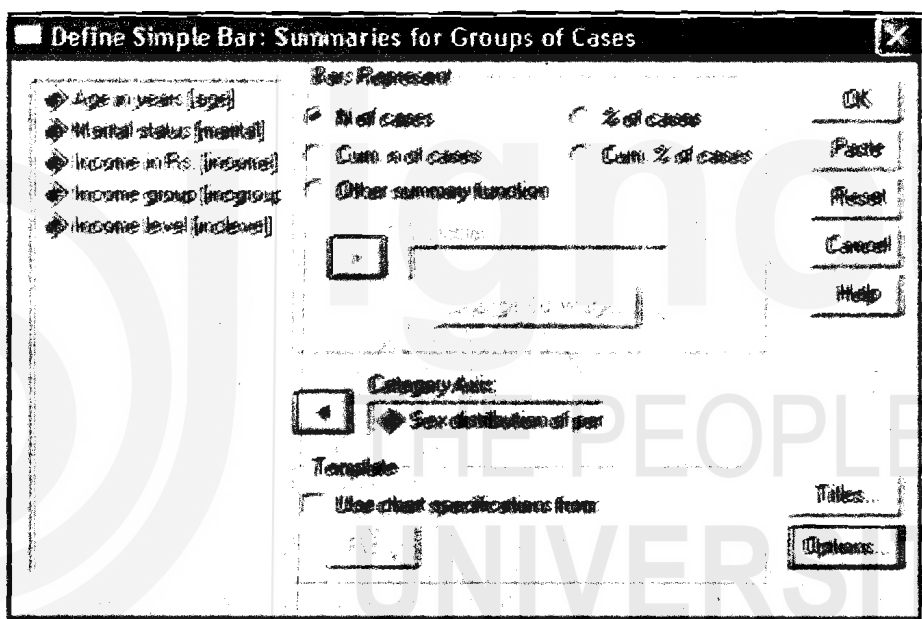


Figure 31.5

Define Simple Bar: Summaries for Groups of Cases

Graph: See in figure 31.6 an example of a completed Bar Chart.

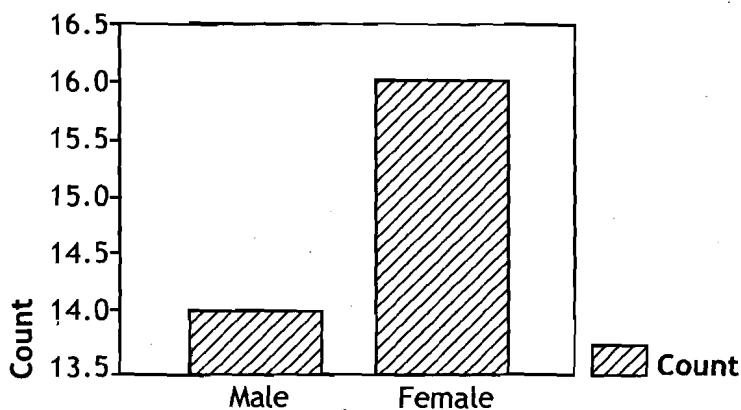


Figure 31.6

Example of a completed Bar Chart on Sex Distribution of Persons

Editing Chart Output[®]

The basic SPSS procedure on creating graphs produces a bare minimum amount of information about the chart. You do not get a title, or number, or percentage for each slice of the chart. You could have generated title of the graph by clicking Titles button on the Define Pie...dialog box in case of pie chart or Define simple bar... dialog box in case of bar chart. However, in SPSS a number of options are available to improve the graph. You can do this with the help of SPSS chart Editor.

- 1) Double click anywhere on the chart. The **Chart Editor** dialog box appears along with a menu bar. You can choose a number of options to improve the chart or change one type of chart to another type of chart.

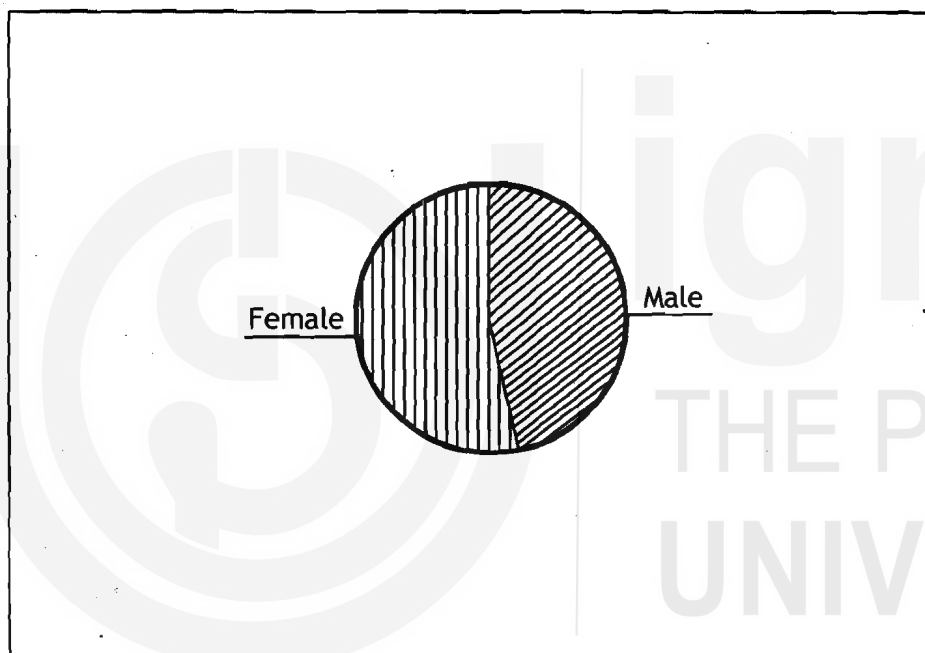


Figure 31.7 Chart 1: SPSS Chart Editor

- 2) **Changing to a different type of chart:** To change the type of chart from pie chart to bar chart, select **Gallery→Bar** command from the menu bar in Chart Editor. The **Bar Charts** dialog box appears. You have three options (Simple, Clustered, or Stacked). Click the **Replace** button to change the chart type to a (Simple) bar chart.

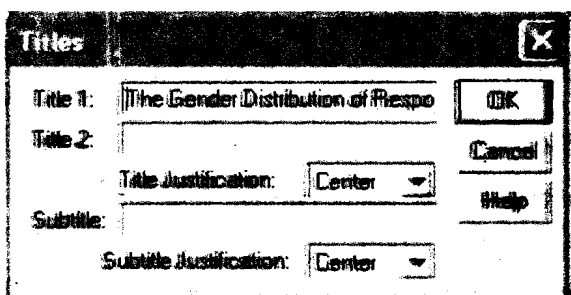


Figure 31.8 Titles

- 3) **Adding Titles to your chart:** To add titles to the chart, select **Chart→Title** command from the menu bar in Chart Editor. The **Titles** dialog box appears. Type the title of the chart in the **Title 1:** and/or **Title 2:** box. Click **OK** button to

close this dialog box and insert the title.

4) **Adding Footnote:** To add footnote to the chart, select **Chart**→**Footnote** command from the menu bar in the Chart Editor.

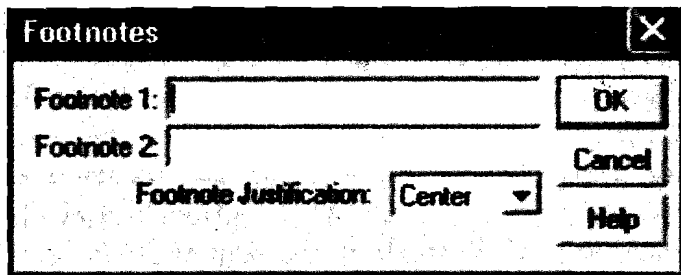


Figure 31.9 Footnotes

The **Footnotes**

dialogbox appears. Type the text for footnotes in the **Footnote 1:** and/ or **Footnote 2:** box. You can also align (Centre, Left, or Right) by selecting the option the **Footnote Justification**-box. Click **OK** button to close this dialog box and insert the typed footnotes.

5) **Options :** select **Chart**→**Options** command from the menu bar in the Chart Editor to change the information that is attached to each slice of the Pie. As we have seen earlier at the time of

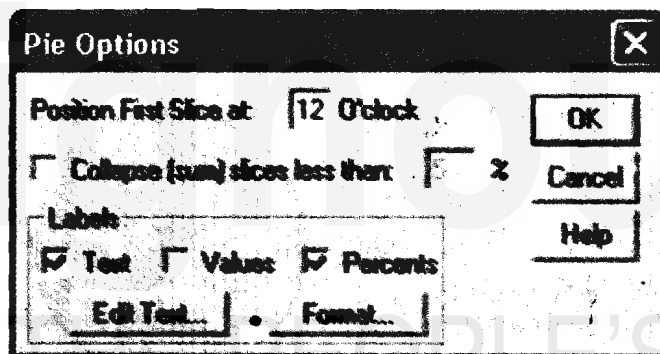


Figure 31.10 Pie Options

creating a chart the default setting for text labels (male/female, etc.) is represented by each slice. In the options dialog box click on the **Values** and **Percents** boxes to generate absolute (number) and relative (percent) frequencies for each slice displayed along with the text label. By clicking **Format** button, you can also set the decimal places either to zero or some other required number of digits.

The Gender Distribution of Respondents

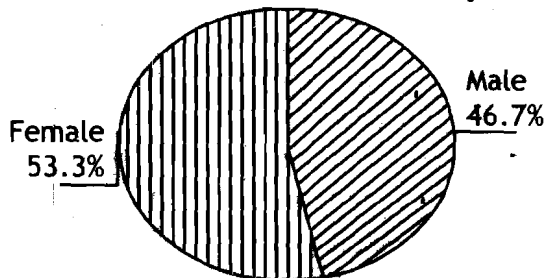


Figure 31.11 Pie Chart on The Gender Distribution of Respondents

You can edit the bar chart created earlier using various features in the Chart Editor.

An example of refined bar chart is shown on the next page.

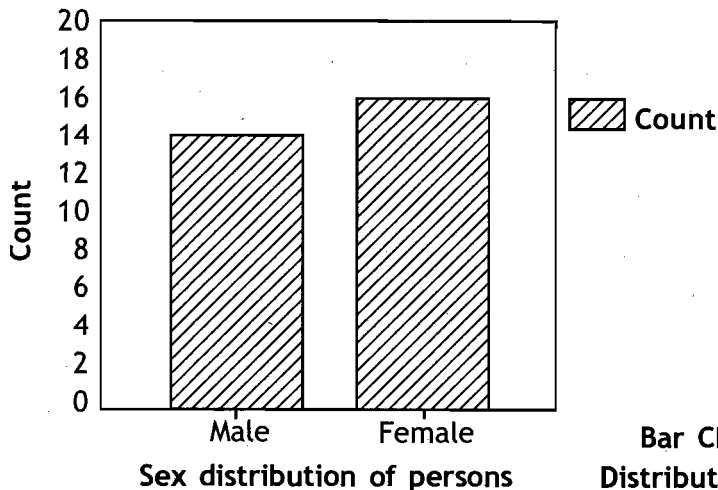


Figure 31.12
Bar Chart on the Gender Distribution of Respondents

Reflection and Action 31.2

At the time of editing a chart you can add or modify some information about the chart. What are the options available for doing so? Discuss the options in terms of changing the chart shown as figure 32.4 in Unit 32 to a different type of chart, adding titles and footnotes to it.

31.4 Working With SPSS Output

All the output generated from statistical and graphical procedures will appear in the SPSS Viewer Window. Every time you run a new procedure in the same session, the output is added at the end of the output of the previous procedure. If the output Viewer Window is closed and another procedure is run, a new output Viewer Window is automatically generated. The Viewer Window has two components: (a) the **Outline Pane***, and

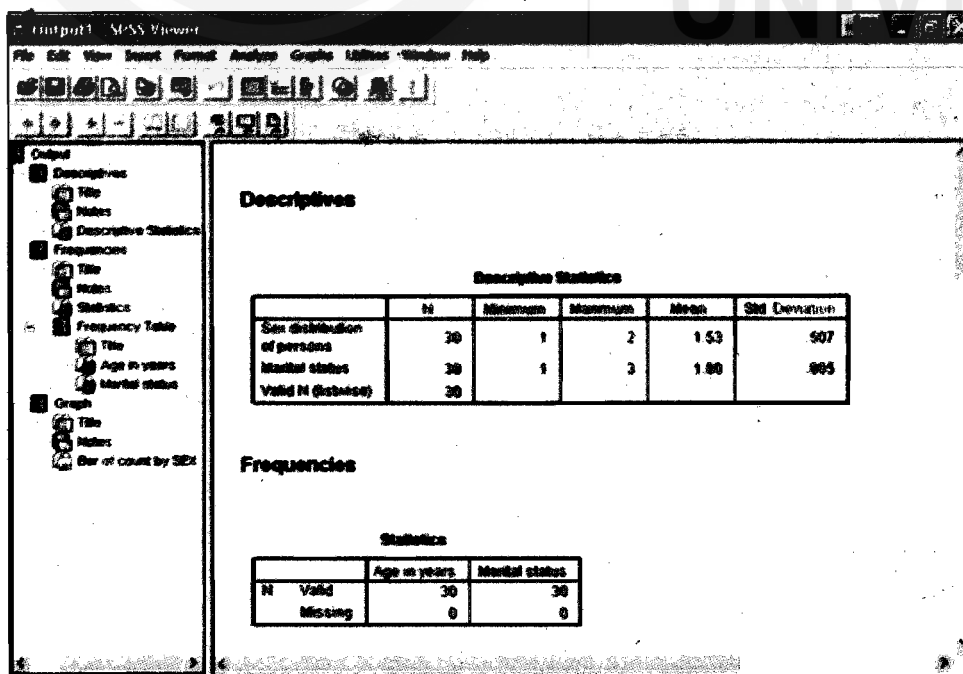


Figure 31.13 Output 1: SPSS Viewer

(b) **Contents Pane.** The Outline Pane is located at the left hand side of the Output Viewer Window and shows the output in outline view as a list of items. The Contents Pane is located at the right side of the Output Viewer Window and displays the actual contents (tables, charts, and text) of the output.

You can click and drag the right (left) border of the outline pane (contents pane) to change the width of the Outline Pane (Contents Pane). This will facilitate enough room in the respective viewer pane.

Browsing Results: You can use the scroll bars (both vertical and horizontal) to browse the results. If you want to go to a particular table/chart/text, click the corresponding caption of the item in the Outline Pane.

You can use the Output Viewer Window to:

- ❖ Browse through the results
- ❖ Show or hide selected tables/text/charts
- ❖ Change the display order of results by moving selected items
- ❖ Use the Draft Viewer for simple text output
- ❖ Use the Pivot Table Editor to rearrange the rows, columns, and layers
- ❖ Copy the items in other applications such as MS Word
- ❖ Delete the selected tables/text/charts
- ❖ Add items to viewer
- ❖ Printing the output

You have learned how to print the output in the earlier Unit on SPSS. You will learn how to copy items in MS Word in the next section of this Unit.

Hiding and Showing Output: In the viewer, you can selectively hide or show the individual text/table/chart. The hidden items (text/table/chart) would not be viewed, copied, or printed with the rest of the output. To hide a table/text/chart, double click its open book icon in the Outline Pane of the Viewer. The open book icon changes to a closed book icon signifying that the

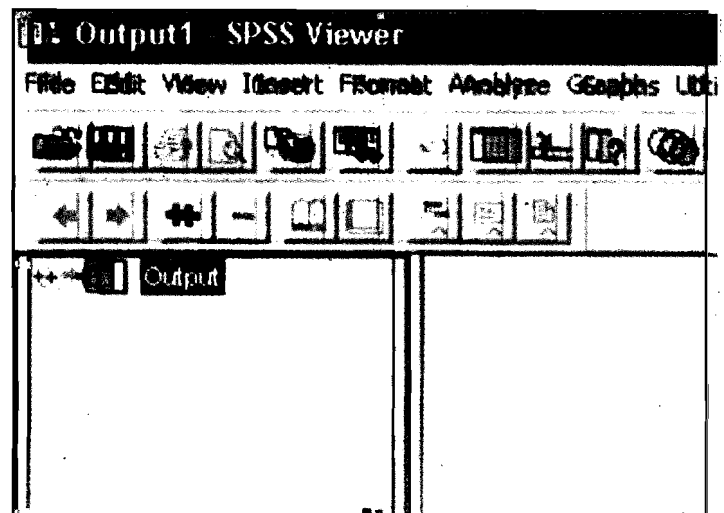


Figure 31.14

Output 1: SPSS Viewer Hiding the Items

particular item of a procedure is hidden. To hide all the results from a particular procedure, click the box to the left of the procedure name in the Outline Pane. This hides all the items (results) from the procedure and collapses the Outline View.

To redisplay the hidden item(s), double click the closed book icon.

Changing Display Order of Items: You can also change the order in which the output is displayed. In the outline pane, click on the items you want to move. Drag the selected items (hold down the mouse button while dragging) to a new location in the outline and release the mouse button. You can also move items by clicking and dragging in the contents pane or selecting **Edit→Cut** command and then select **Edit→Paste After** command on the menu bar.

Deleting Items: Click an item on the Outline Pane or Contents Pane to select the item. Press **Delete** key on the keyboard. The item is deleted.

Changing Items Alignment: By default all results are initially left aligned. You can change the alignment of selected items. For this, click on the items either in Outline Pane or Contents Pane to select the items you want to align. Select **Format→Align Left** to align left or **Format→Align Right** to align right or **Format→Align Centre** command from the menu bar.

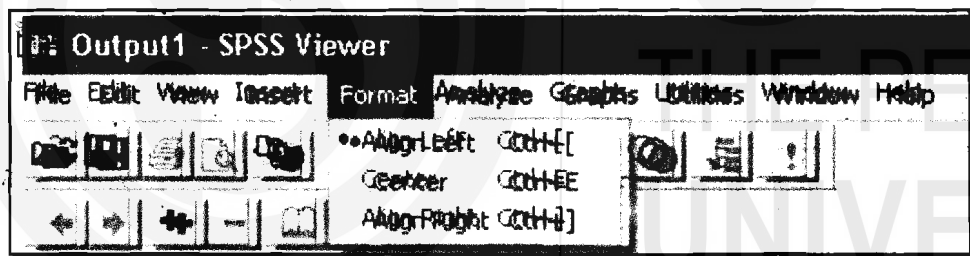


Figure 31.15 Output 1: SPSS Viewer Changing Items Alignments

Adding Items: In the Output Viewer, you can add items such as text, charts, or material from other applications such as Word or Excel. Text items not connected to a table or chart can be added to the Viewer. Click on the text, table, or chart object will precede the title or text you are intended to add. Select **Insert→New Title** command or **Insert→New Text** command from the menu bar. Double click the new object. Enter the text/title you want at this location.

The screenshot shows the SPSS Viewer interface. On the left is the Outline Pane with a tree view of objects including 'Table', 'Text', 'Notes', and 'Pivot Table'. The main area displays a table with the following data:

Valid	Unmarried	133	4433	4433	4433
	Married	100	3333	3333	7067
	Unmarried	77	2233	2233	10000
	Total	300	10000	10000	

Figure 31.16 Output 1: SPSS Viewer Adding Items

To insert a text file, in the Output Viewer, click a table, chart or text item that will precede the text file you are indented. Select **Insert→Text File...** command from the menu bar. Select the text file to be inserted. Observe that the text file is inserted. To edit the text, double click the item.

Draft Viewer

The Draft Viewer provides results in a draft form when you run a procedure. The text output in the Draft Viewer can be edited, the charts can be resized, and both the text and charts can be copied to other applications such as MS Word. You cannot edit the charts and the Draft Viewer does not include interactive features of pivot tables. That means if you prefer simple text output rather than interactive pivot* tables, you can use the Draft Viewer.

To create a draft output, open the Draft Output Window by selecting **File→New→Draft Output** command in the Data Editor Window and then run a procedure in the Draft Viewer Window.

The screenshot shows the SPSS Draft Viewer window with two tables. The first table is titled 'Marital status' and the second is 'Sex distribution of persons'. Both tables are presented as text-based tables with columns for Frequency, Percent, Valid Percent, and Cumulative Percent.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Married	13	43.3	43.3	43.3
	Unmarried	10	33.3	33.3	76.7
	Widowed	7	23.3	23.3	100.0
	Total	30	100.0	100.0	

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	14	46.7	46.7	46.7
	Female	16	53.3	53.3	100.0

Figure 31.17 Draft 5: SPSS Draft Viewer

Controlling the Format: The output that would be displayed as pivot tables in the Draft Viewer is converted to text output. The default settings for converted pivot table output include:

- a) Each column in the table is set to the width of that column label. Therefore, the column labels are not wrapped in multiple lines.
- b) Instead of tabs, the alignment is controlled by spaces.
- c) Box characters from the SPSS market set are used as row and column separators. If the box characters are turned off, vertical

- line characters (|) are used as column separators and dashes (-) are used as row separators.

You can control the format of the table output using Options dialog box before you run a procedure. For this, select **Edit**→**Options** command in the menu bar before you run a procedure. The **Options** dialog box appears on the screen. Click on the **Draft Viewer** button. To reduce the width of tables, you should reduce the column width containing long labels. Click on **Maximum** button under **Column width:** area in the options dialog box. Type the maximum number of characters that a column width can hold in the box against **characters**. The labels longer than the specified width are wrapped to fit the maximum column width. You can change the default box characters for row and column borders. You can also specify different cell separators or enter blank spaces if you do not want any characters used to mark rows and columns. For this, remove the check mark in the **Display Box Character** box in the options dialog box. Type a character (which you want as row separator) in the box against **Row:** Under **Cell Separators:** area. Similarly, type a character (which you want as column separator) in the box against **Column:** Under **Cell Separators:** area. Typing a space character in the **Row:** and/or **column:** boxes will result a table with corresponding blank borders.

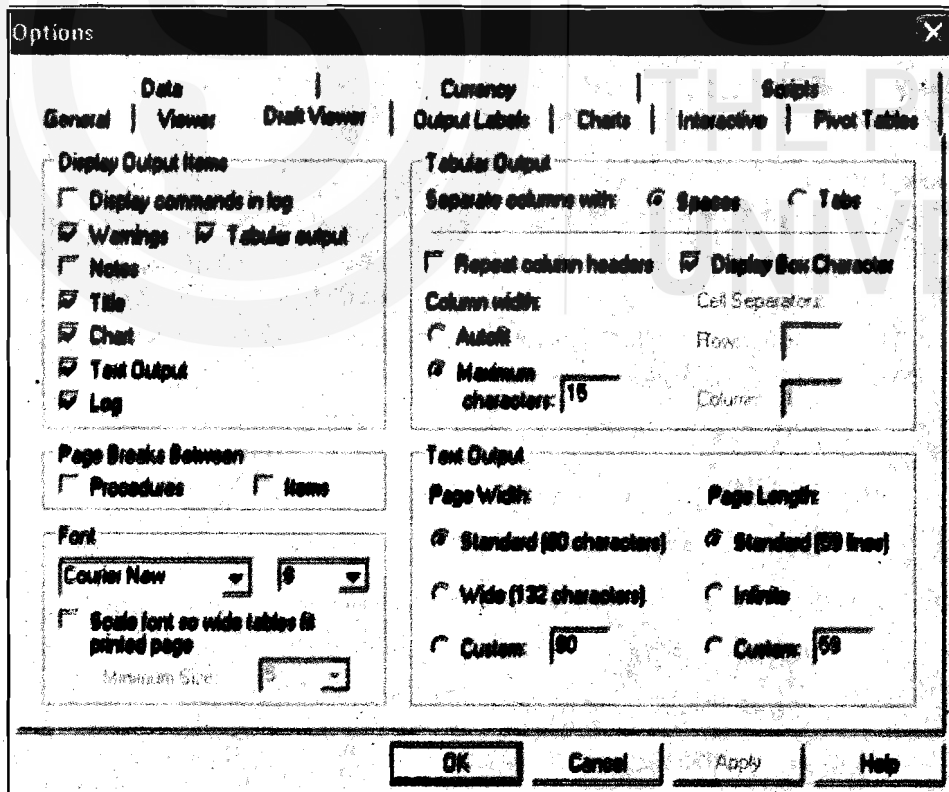


Figure 31.18 Options

The Draft Viewer is designed to display space-separated output in a fixed pitch font. If you want to copy the output to some other application such as MS Word document, select **Tabs** for the column separator. For

this, check mark the **Tab** button against **Separate Columns Width** in the options dialog box. With this selection, you can use any font that you want in the MS Word like applications and set the tabs to align output properly. However, tab separated output will not align properly in the Draft Viewer. You can change the font type and their sizes in the Options dialog box. For this select the font type in the list box **Under Font** and then the size in the next list box. To print or save the Draft output follow the steps explained in earlier Unit on SPSS.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Male	14	46.7	46.7	46.7
Valid Female	16	53.3	53.3	100.0
Total	30	100.0	100.0	

Figure 31.19
Draft output
before and after
setting
Cell separators
and Column width

Pivot Tables

In SPSS many of the results from statistical procedures are displayed in default Pivot tables. The default labels produced may not display information as neatly or as clearly as one would like. With Pivot tables you can rearrange the rows, columns, and layers. Some of the options for modifying a Pivot table are:

- ❖ Interchanging rows and columns
- ❖ Moving rows and columns
- ❖ Creating multidimensional layers
- ❖ Grouping and ungrouping rows and columns
- ❖ Showing and hiding cells
- ❖ Rotating row and column labels
- ❖ Finding definitions of terms used

Accessing Output Definitions: Many of the statistical terms are displayed in the output. Definitions of these terms can be accessed directly in the Output Viewer. For example, double click **Case Processing Summary** pivot table. Right click **Valid** and select **What's This?** from the pop-up menu. Observe that the definition of **Valid** is displayed in a pop-up Window.

Case Processing Summary				
		Cases		
		Valid	Missing	Total
Persons	Valid	300	0	300
Persons	Missing	0	0	0
	Total	300	0	300

Figure 31.20 Case Processing Summary

Editing a Pivot Table

To edit a Pivot table, activate the table by double-clicking the table you want to edit. Click a label or text or number you want to edit. The menus change to display commands relevant for editing table attributes. In addition, a table toolbar and a Pivoting Tray dialog box appear allowing you to change the table attributes.

The screenshot shows the SPSS Viewer window with a Pivot Table titled 'Case Processing Summary'. The table has columns for 'Cases' and 'Total', and rows for 'Valid' and 'Missing'. A Pivot menu is open, showing options like 'Rows', 'Columns', and 'Layers'. A Pivoting Tray dialog box is also visible, showing a table with columns 'Unintended', 'Intended', and 'Total'.

Case Processing Summary			
		Cases	
		Valid	Missing
Persons	Valid	300	0
Persons	Missing	0	0
	Total	300	0

Figure 31.21 Output 2: SPSS Viewer

If the Pivoting Tray dialog box is not visible on the screen, select Pivot?Pivoting Trays command from the menu bar. The Pivoting Trays provide a way to move data between columns, rows, and layers. The Pivoting Tray contains three pivot icons representing layers, columns, and rows. Move the cursor on one of the pivot icons to see what it represents. The shaded area in the table indicates what will be moved when you move that pivot icon. Also, when you move the cursor on a pivot icon, a pop-up label will be displayed indicating what that icon represents in the table. Drag an icon from one tray to another tray. The table immediately changes the arrangements in the table. For example, if you want to change the sex category from the row to column drag the icon from Row tray to the Column tray.

Transposing Rows and Columns: Activate the table by double clicking the table. Select **Pivot**→**Transpose Rows and Columns** command on the menu bar. This will change all the columns to rows and rows to columns.

Count		Marital status			Total
		Married	Unmarried	Widowed	
Sex distribution of persons	Male	6	6	2	14
	Female	7	4	5	16
Total		13	10	7	30

Count		Sex distribution of persons		Total
		Male	Female	
Marital status	Married	6	7	13
	Unmarried	6	4	10
	Widowed	2	5	7
Total		14	16	30

Figure 31.22 Transposing Rows and Columns

Changing the display order of rows and columns: The order of Pivot icons in dimension (row, column, layer) tray reflects the display order of elements in the pivot table. Drag the respective icons in each tray to the order you want (left to right or top to bottom).

Moving rows and columns: Activate the Pivot table by double clicking. Click the label for the row or column you want to move. Click and drag the label to the new position. Select **Insert Before** or **Swap**® from the pop-up menu.

Marital status		Total
Unmarried	Widowed	
		14
		16
10	7	30

Figure 31.23 Moving Rows and Columns

Grouping Rows and Columns: You can group a number of rows or columns in a table by inserting a group label. For this, activate the table by double clicking on it. Select the rows or columns you want to group together. Click and drag the mouse to select multiple cells containing row headings or column headings where you want to insert a row or column group heading. Select Edit?Group command on the menu bar. A group label is automatically inserted. Double click the group label to edit the label text. If you want to add a new row or column to an existing group, you should first ungroup the items currently in the group and then create a new group that includes the new items. To ungroup rows or columns you should remove the group labels. For this, select the group label by clicking anywhere in the group label for the rows or columns you want to ungroup. Select Edit→Ungroup command on the menu bar. This will automatically delete the group label.

Rotating Labels: You can rotate either the inner most column labels or outer most row labels. For this activate the Pivot table. Select Format→Rotate Inner Column Labels command for rotating innermost column labels or Format→Rotate Outer Row Labels for rotating outer most row labels.

Count		Marital status			Total
		Married	Unmarried	Widowed	
Sex distribution of persons	Male	6	6	2	14
	Female	7	4	5	16
Total		13	10	7	30

Count		Marital status			Total
		Married	Unmarried	Widowed	
Sex distribution of persons	Male	6	6	2	14
	Female	7	4	5	16
Total		13	10	7	30

Figure 31.24 Rotating Labels

Creating and Displaying Layers: Layers can be useful for large tables with nested categories of information. By creating layers, you can simplify the look of the table, making it easier to read. Layers work best when the table has at least three variables. Activate the table by

double clicking it. Drag an icon from the Row tray or column tray into the Layer tray. Each layer icon has left and right arrows. The visible table is the table for the top layer. To view the different layers, you can either click the arrows on layer icon or select a layer from the drop-down list in the table.

Hiding cells: You can hide many types of cells in a table:

- a) Dimension labels
- b) Category labels without hiding the data cells
- c) Label cell and data cells in a row or column
- d) Footnotes, titles, and captions

To hide rows and columns in a table, select View-Hide on the Pivot Table menu bar or right click the highlighted row or column to show the pop-up menu and then choose Hide category from the pop-up menu.

To show the hidden rows and columns in a table, select another label in the same dimension as the hidden row or column. For example, if the Male category of the Gender distribution is hidden, click the Female category. Select **View→Show All Categories** in Gender command on the menu bar or select **View→Show All** command on the menu bar. This command displays all hidden cells in the table.

To hide (or show) a dimension label, activate the pivot table. Select the dimension label or any category label within the dimension. Select **View→Hide (or Show) Dimension Label** command on the menu bar to hide (show) the selected dimension label.

To hide or show a footnote in a table, select the footnote and then select **View→Hide (or Show)** command on the menu bar to hide (or show) the selected footnote.

TableLooks: You can change the appearance of a table either by changing

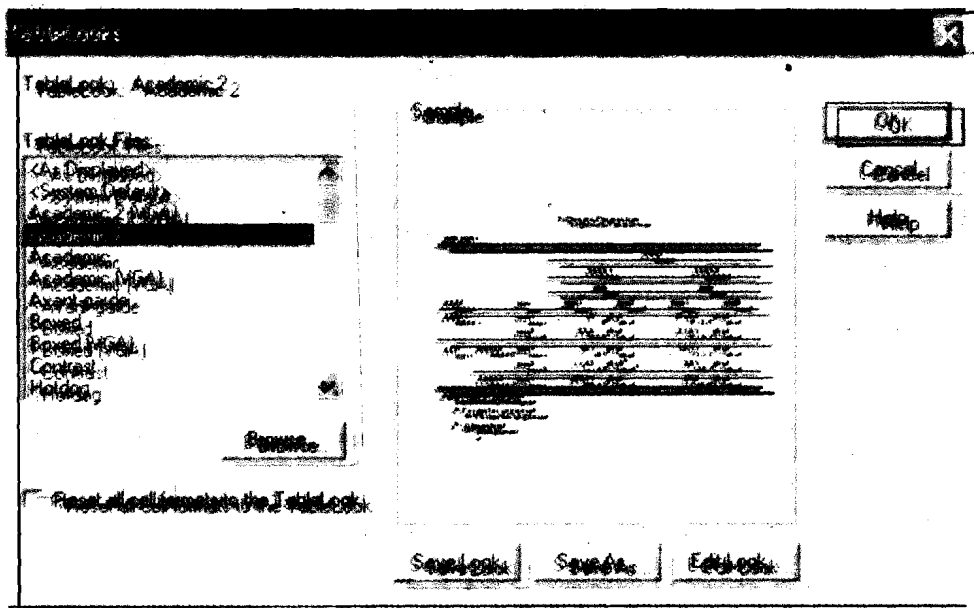


table properties or by applying TableLook. Each TableLook consists of a collection of table properties, including general appearance, footnote properties, cell properties, and borders. You can either select a preset TableLook or create and save a custom TableLook of your own. To apply a preset TableLook to your table, activate the pivot table by double clicking the table. Select **Format**→**TableLooks...** command on the menu bar. The TableLooks dialog box appears on the screen. Select a TableLook from the list of files under **TableLook Files**. Click **OK** button to apply the selected pivot table.

To edit a selected TableLook or to create your own TableLook, select a TableLook from the list of files as explained above. Click **Edit Look** button. The **Table Properties** dialog box appears on the screen. Select the appropriate options in the menu to adjust the table properties for attributes you want. Click **OK** button in the Table properties dialog box. Click **Save Look** to save the edited Table Look or click **Save As** to save it as a new TableLook. Note that editing a TableLook affects only the selected pivot table. An edited TableLook is not applied to any other labels that use that TableLook unless you select those tables and reapply the TableLook.

The Table properties dialog box allows you to set general properties of a table, set cell styles for various parts of a table, and save a set those properties as a TableLook.

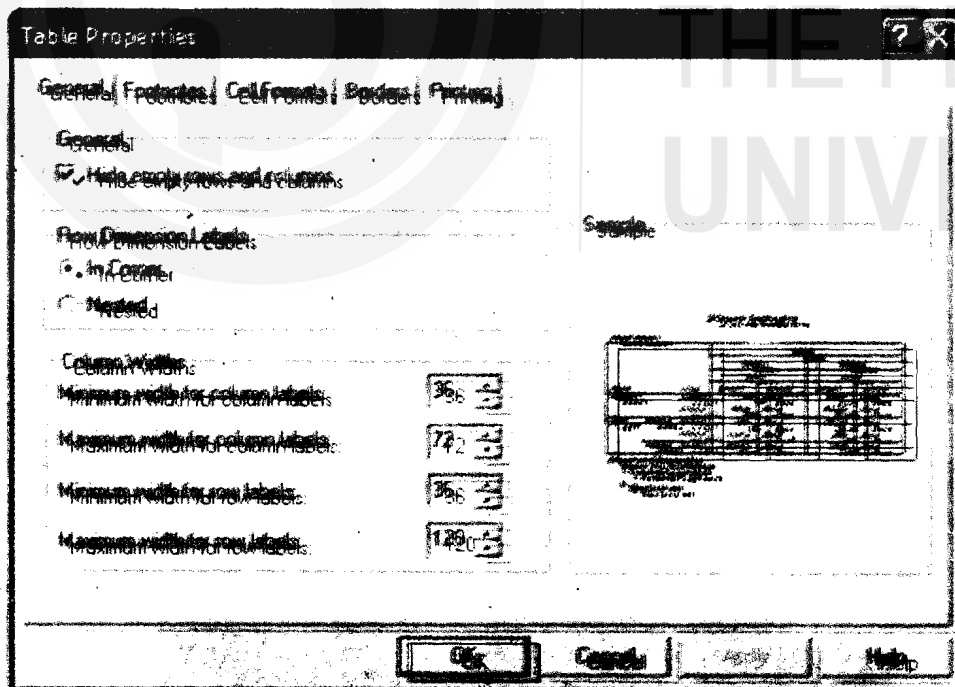


Figure 31.26 Table Properties

Using **General** tab on the Table Properties dialog box, you can control general properties of the table such as hiding empty rows or columns and adjusting printing properties.

Click the **Footnotes** tab to control the format and the position of footnote markers.

Click **Cell Formats** tab to determine specific formats for cells in the data area, for row and column labels, and for other areas in the table.

Click **Borders** tab to control the width and column of the lines forming the borders of each area of the table.

Click **Printing** tab to control printing properties.

Reflection and Action 31.3

You have just learnt the while working with SPSS output, it is possible carry out several activities like browsing through the results, show or hide selected table/ text/ charts etc. Write answers of the following questions.

How do you transpose the rows and columns of a table? What are the steps involved in it?

Can it be possible to hide some results in SPSS Output Viewer without being deleted? If so what are the steps to hide the selected results?

What dialog box will help you in changing the look of a Pivot Table. What are the general properties you can control using this dialog box?

31.5 Copying SPSS Output to MS Word Document

If you want to include some or all of your tables and charts generated by SPSS into your report, you can copy and paste them from the SPSS Viewer window into a Word document. The basic procedure is same for copying data from the Data Editor and text, tables, and charts from Output Viewer window.

- 1) Copy the text, table, or chart from the SPSS Output Viewer window to the Windows Clipboard. Or copy the data from the SPSS Data Editor to the Windows Clipboard.
- 2) Paste the copied data/text/table/chart to the Word document from the Windows Clipboard.

This means, while copying and pasting the data/output, the respective program should be open.

Copying Data from SPSS Data Window

The screenshot shows the SPSS Data Editor window with a menu bar (File, Edit, View, Data, Transform, Analyze, Graphs, Utilities, Window, Help) and a toolbar. The data table has the following structure:

	sex	age	marital	income	incgroup	instlevel	total
1	2						
2							
3							
4							
5							
6							
7							
8							
9							
10							
11	1	34	2	35000	400	200	
12	2	55	3	23000	100	100	

To copy the data from your SPSS Data Editor into your Word document, follow the steps given below:

- 1) Start the SPSS program. Open the data file (with extension .sav) using the Data Editor. Select the data area (rows and columns) you want to copy.
- 2) Select **Edit→Copy** command from the menu bar of SPSS Data Editor Window. The data is now copied to the Windows Clipboard.
- 3) Start the Word program. Open the Word document where you are typing your report and want to copy the selected data. Select the page and paragraph. Position the insertion point by clicking the mouse.
- 4) Select **Edit→Paste** command from the menu bar of Word window. The data is now copied from the Windows Clipboard to your Word document at the insertion point.

Or

Select **Edit→Paste Special** command from the menu bar of Word window. The **Paste Special** dialog box appears on the screen. Select **Unformatted Text** under **As:** and then, click **OK** button. The data is now copied from the Windows Clipboard to your Word document at the insertion point.

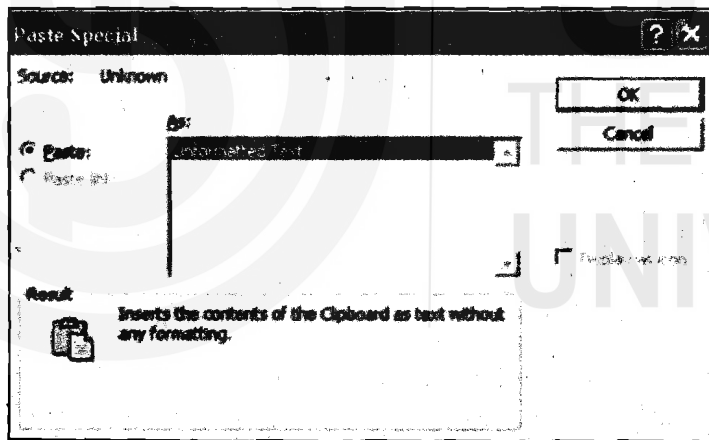


Figure 31.28 Paste Special

You can edit the data or reformat the settings if needed in your Word document.

2	24	1	150000	3.00	1.00
1	52	1	345000	4.00	2.00
2	65	3	45000	1.00	1.00
1	35	3	245000	4.00	2.00
1	42	1	23000	1.00	1.00
1	25	1	670000	5.00	2.00
2	23	2	345000	4.00	2.00
2	63	1	156000	3.00	2.00
1	41	2	65300	2.00	1.00
2	48	1	150000	3.00	1.00

Figure 31.29 Data as Copied from SPSS Data Editor
into Word Document

Copying Text or Tables from SPSS Output Viewer

We will explain here the following three formats: (a) Picture, (b) Formatted Text (RTF), and (c) Unformatted Text. For clarity, we will also explain the steps involved in three stages: (a) selection, (b) copy, and (c) paste. Also, you can either copy multiple items or single items.

Stage-1: Select Items (Text/Tables/charts) from SPSS Output Window

Start the SPSS program. Open the data file (with extension .sav) using the Data Editor. Perform the statistical procedure to generate the output. As you have seen in the earlier Unit the output will be generated in the SPSS Output Viewer window.

If you have already generated the output and saved in a output file (with extension .spo) open the output file by selecting File→Open→Output... command on the menu bar of SPSS Data Editor.

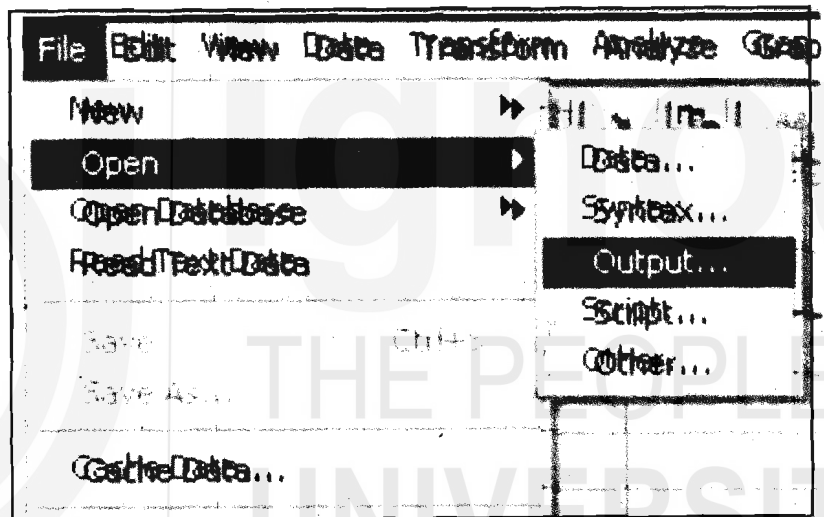


Figure 31.30 Selecting Items from Menu Bar of SPSS Window

In the Outline Pane of the Output Viewer window, select either single individual item (table/text/chart) or multiple items (tables/text/chart) you want to copy by clicking on the items. Now the Table(s)/text/chart(s) is (are) ready for copying.

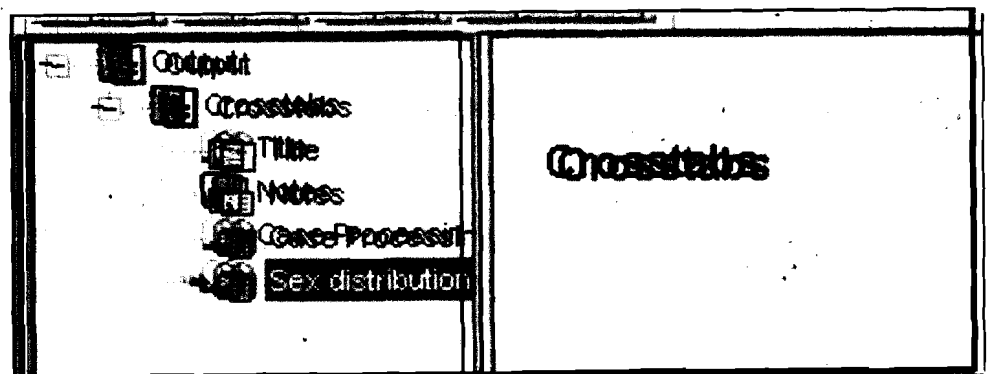


Figure 31.31 Selecting Single Individual Item
from Menu Bar of SPSS Window

Stage-2: Copy Item(s) (Text/Table(s)/chart(s)) from SPSS Output Window:

Copying Single Item: For copying a single item, after selecting the text/table/chart to be copied, select **Edit→Copy** command from the menu bar of SPSS Output Window. The selected item is now copied to the Windows Clipboard.

Copying Multiple Items: For copying multiple items (text/tables/charts) use the **Edit→Copy Objects** command on the menu bar. The selected items are now copied to the Windows Clipboard.

Stage-3: Paste Item(s) (Text/Table(s)/Chart(s)) into Word Document

Start the Word program. Open the Word document where you are typing your report and want to copy the selected item(s). Select the page and paragraph. Position the insertion point by clicking the mouse.

a) Pasting Single Items

Text Item: If the item you are pasting is a text item, select **Edit→Paste** command on the menu bar. The text item is now copied from the Windows Clipboard to your Word document at the insertion point. You can edit the text item.

Table Item: If the item you are pasting is a table item, select **Edit→Paste Special** command on the menu bar. The **Paste Special** dialog box appears on the screen. Now you have three options in the dialog box.

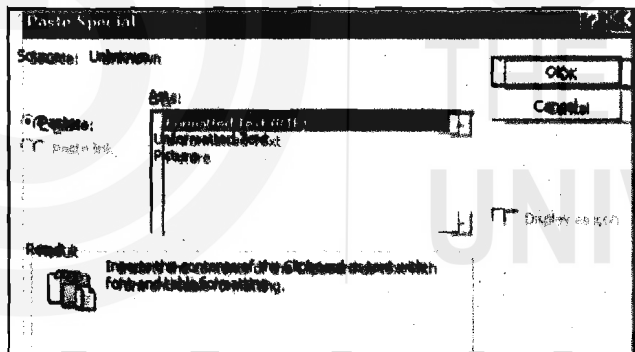


Figure 31.32 Paste Special for Pasting a Table Item

Table as Formatted Text (RTF): Select **Formatted Text (RTF)** under **As:** box in the dialog box. Click **OK** button. The table is now copied from the Windows Clipboard to your Word document at the insertion point. The advantage of copying the tables as formatted text is that you can edit the table or reformat the settings if needed in your Word document. However, you may have to do some setting if needed in the table to improve the table look.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Sex distribution of persons	30	1	2	1.53	.507
Marital status	30	1	3	1.80	.805
Valid N (listwise)	30				

Figure 31.33 Descriptive Statistics in Formatted Text

Table as Unformatted Text: Select **Unformatted Text** under **As:** box in the dialog box. Click **OK** button. The table is now copied from the Windows Clipboard to your Word document at the insertion point. You can edit the table if needed. However, you may have to adjust the tabs to set the columns to align properly.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Sex distribution of persons	30	1	2	1.53	.507
Marital status	30	1	3	1.80	.805
Valid N (listwise)	30				

Figure 31.34 Descriptive Statistics in Unformatted Text

Table as Picture: Select **Picture** under **A** box in the dialog box. Click **OK** button. The table is now copied from the Windows Clipboard to your Word document at the insertion point. The table is copied as an independent graphic clip, so the text in the table can no longer be edited by you in the Word document. The layout, font size, style, and any box characters will automatically be preserved. The graphic can be resized and positioned on a page within Word document. However, information is lost when editing the graphic in Word. Therefore, if you want to change the titles or labels or other formatting of text/table, it will be better you do it in SPSS Output Viewer Window as we explained in section 32.3.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Sex distribution of persons	30	1	2	1.53	.507
Marital status	30	1	3	1.80	.805
Valid N (listwise)	30				

Figure 31.35 Descriptive Statistics as 'Picture

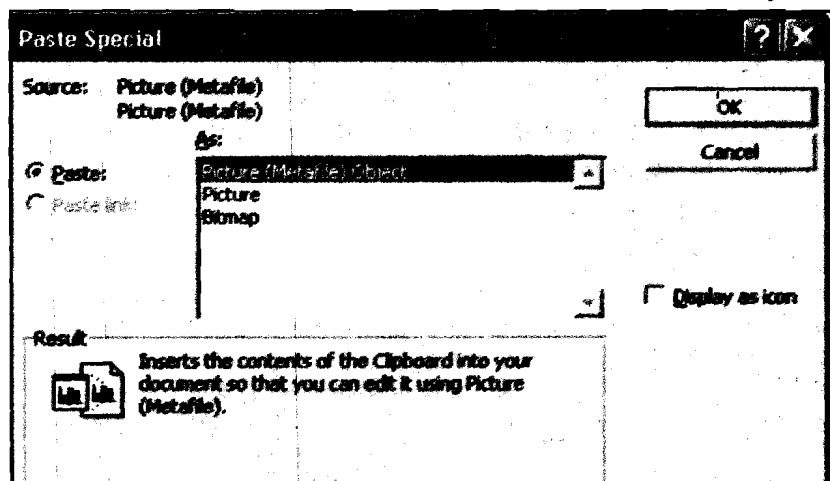


Figure 31.36 Paste Special to Paste a Chart Item

Chart Item: If the item you are pasting is a chart item, select **Edit→Paste Special** command on the menu bar. The **Paste Special** dialog box appears on the screen. Now you have three options in the dialog box. **Picture (Metafile) Object, Picture, and Bitmap.** Whatever the option you choose, you cannot do any editing in the Word document except resizing. Therefore, we explain only Pasting as picture in this Unit.

Chart as Picture: Select **Picture** under **As:** box in the dialog box. Click **OK** button. The chart is now copied from the Windows Clipboard to your Word document at the insertion point. The chart is copied as an independent graphic clip, so the text in the table can no longer be edited by you in the Word document. The layout, font size, style, and any box characters will automatically be preserved. The graphic can be resized and positioned on a page within Word document. However, information is lost when editing the graphic in Word. Therefore, if you want to change the titles or labels or other formatting of text/table, it will be better you do it in SPSS Output Viewer Window as we explained in section 32.2.

a) Pasting Multiple Items:

To paste multiple items, first select multiple items (as explained at stage-1) and then copy items (as explained at stage-2), select **Edit→Paste** command from the menu bar of Word window. The objects are now copied from the Windows Clipboard to your Word document at the insertion point.

The text items are copied as **Formatted Text** and therefore you can edit the text items. However, each table and/or chart item will be pasted as individual Objects (Picture). Each object can be resized and positioned on a page within Word document. However, information is lost when editing the graphic in Word. If you want to change the titles or labels or other formatting of table or chart, it will be better you do it in SPSS Output Viewer Window as we explained in section 32.2 and 32.3.

Reflection and Action 31.4

Section 31.5 has explained how to copy items generated by SPSS into your report that is in MS Word. Answer the following questions.

What are the three major stages in copying the SPSS output into your Word document?

Suppose you want to copy a chart from SPSS output window into the Word document. Write the steps involved in it.

31.6 Conclusion

Presentation of text, tables, and charts that you have generated using SPSS statistical procedures in your report is very important. This is because you can make your report more readable, analytical, and communicable to the reader/ audience. The graphical presentation of data is one of

the significant ways analysing the information in a more meaningful way. Using SPSS you can create a number of different types of charts. In this Unit we have introduced you to how to create and edit a simple pie chart and bar chart. Like your word processor program, most of the commands in SPSS are simple, interactive, and routine. By trying to create other charts you will be able to master the SPSS program.

Using the Output Viewer window, you can edit and improve the look of your tables. You can change the order of tables, insert new text, delete or add items, print output, and copy the output to your report document in MS Word. Use the Draft Viewer Window and change preset options to improve the table look as per your needs before you run a procedure. The Pivot Tables are more interactive. With pivot tables you can access the definitions of the statistical terms used in the tables. This will help you in interpreting the statistical results. You can also, reformat the tables by transposing the columns and rows, changing the order of rows or/and columns, show or hide cells, group or ungroup the row and column labels.

The section on copying the text/tables/charts from SPSS Output Viewer Window to your MS Word document will help you to copy results directly to your report without being typed again. This will save you a lot of time and eliminate the possibility of errors in typing your report.

Remember that there are many statistical procedures (from basic to advanced) available in SPSS. We did not cover all of them here as the objective in this course is only to introduce SPSS to the students.

Further Reading

Davis, J. 1984. Data into Text. IN R. F. Ellen (ed.) *Ethnographic Research: A Guide to General Conduct*. Academic Press: London, pp. 295-318 (especially sections 9.4 to 9.4.5 from page 308 to 314)



Unit 32

Tabulation and Graphic Presentation - Case Studies

Contents

- 32.1 Introduction
- 32.2 Structure for Presentation of Research Findings
- 32.3 Data Presentation: Editing, Coding and Transcribing
- 32.4 Case Studies
- 32.5 Qualitative Data Analysis and Presentation through Computer Software
- 32.6 Types of ICT used for Research
- 32.7 Conclusion



Learning Objectives

- ❖ The general structure for presentation of research findings
- ❖ Role of ICTs in presentation of research findings
- ❖ The application of ICT tools through case studies
- ❖ The various steps for report presentation.

32.1 Introduction

In Unit 31 we have discussed the salient features of SPSS in report writing, creating and editing graphs and analysed data by using univariate, bivariate and multivariate statistics. In Unit 32, we will discuss the structure of report presentation with the help of information and communication technology (ICT).

We will also introduce you to some cases of the presentation of research findings with the help of audio and software for qualitative data analysis and presentation. The cases will help you understand the process of applying the ICT tools. For this reason, this unit does not carry any boxes with supplementary information. It does not also require you to complete Reflection and Action exercises as long as you are trying to follow each case study to master the art of applying new tools for presenting your research findings.

32.2 Structure for Presentation of Research Findings

It is important to look carefully at the existing publications of the kind you are trying to write - style, length, and format - for your writing. The following structure shown on the next page will apprise you how to present your findings through computer.

Structure for a research report presentation

a) Abstract	b) Background of research	c) Review of related literature
d) Research methods	e) Findings	f) Analysis
g) Discussion	h) Conclusion	i) Summary and Suggestions
j) References	k) Glossary	l) Appendix

Figure 32.1 Structure for Presentation of Research Project Report

Before presenting your research findings, you need to check the following:

- ❖ Availability and suitability of the computer
- ❖ Availability of the electrical point
- ❖ Familiarity with software and hardware
- ❖ You can obtain technical support, if necessary
- ❖ Test the data-collection instrument
- ❖ To see, there is clear storage and retrieval system for data collection, etc.

Presentation of your research findings depends on your intended target group. For example, papers or articles for journals and magazines will be presented in different format than book chapters or final research report. Therefore, you have to decide yourself about the format for the presentation of your research findings. You may visit <http://www.sociology.org.uk/rrocr1.pdf> for the structure of research report on your subject area.

32.3 Data Presentation: Editing, Coding and Transcribing

The processes of editing, coding and transcribing are extremely important for the presentation of accurate research findings. If the study is conducted through primary base data (i.e., through questionnaire), the following steps are very important:

- ❖ Responses should be scrutinised for completeness and for errors.
- ❖ Response validation is obtained by recontacting individuals whose answers appear inconsistent or unusual.
- ❖ Open-ended questions should be properly classified or scored, while responses to both qualitative and quantitative questions are coded for data entry.

For a detailed treatment of these aspects, see the units in Block 6 on Survey Research.

Editing primary data[®] is a fairly complex task. In fact, it requires great skill and experience, while editing. The data should be complete, consistent, accurate and homogenous. Quite a few steps have been presented below for presenting primary data.

- a) **Complete data:** You should see that the answer to each and every question has been given. If a few questions remain unanswered, then you should mark them as 'Not reported' (NR).
- b) **Consistent data:** You should see that the answers to questions are not contradictory. If there are mutually contradictory answers, you should try to obtain the correct answers either by referring back the questionnaire or by contacting the respondent.
- c) **Accurate data:** If the data is inaccurate, it can easily be corrected. But, in some case, it is very difficult to correct it, for example, income and age group informed by the respondents. In this case, we have to accept whichever the respondent gives us.
- d) **Homogenous data:** You should see that information supplied by the respondents is homogenous. If it is not, it cannot be comparable.

Now, after making you aware of how data is edited and collected, in the forthcoming sections we are presenting some cases and illustration of the presentation of research findings. In some cases, it has been presented with the help of the computer along with Internet and digital media.

32.4 Case Studies

Here are four case studies for you to carefully study and then taking them as examples, you may also attempt to present your research findings in the same manner.

Case 1: Questionnaire Coding

The following figure (32.1) represents the responses to the questionnaire* which was designed to conduct a study on "the socio-economic profile of rural people of Haryana". The questionnaire code identification number is 0412. To facilitate data entry, each selected individual's four-digit number is presented. The first number (04) indicates it is the district code i.e. Kurukshetra. The next two digits, i.e., 1 and 2, indicate Tehsil and Village codes. The digits within brackets indicate along with the questionnaire the coding of the questions. This questionnaire is designed for you to give a broad idea of coding. This is only for part of the questionnaire.

QUESTIONNAIRE			
Q. Code	0	4	1 2
A Study of Socio-economic profile of rural people of Haryana			
Q.1 Family members:	(a) 3-4 (1)	(b) 5-6 (2)	(c) 7-8 (3)
	(d) 9-10 (4)	(e) >10 (5).	
Q.2 Age profile:	(a) below 20(1)	(b) 20-25 (2)	(c) 26-30 (3)
	(d) 31-35 (4),	(e) 36-40 (5)	(f) 41-50 (6) (g) > 50 (7)
Q.3 Gender	(a) Male (1)	(b) Female (2)	

Figure 32.2 Questionnaire Coding

After coding this data, you can present it in table (see Table 33.1) and graphic format. You can put this data into spreadsheet and by pressing a few buttons (see Figure 32.3), it is possible to produce what looks like the most wondrous variety of charts and graphs. For example, with excel column, bar, line, pie and others are all possible to make and use in the report presentation.

Q. Code	Q1.	Q2	Q3
0412	2	4	1
0413	3	3	0
0414	4	3	2
0415	1	3	1
0416	1	1	2
0417	3	3	1
0418	4	3	1
0420	5	0	2
0421	4	3	0
0422	3	3	2
0423	2	3	1
.	1	4	2
.	4	4	1
.	3	3	1
.	1	4	1
.	1	1	2
.	.	.	.
n=(230)	230	230	230

Figure 32.3 Coding of Questionnaire Data

Let us now look at the coded data in tabular form. See Table 32.1 on Gender Distribution of the Respondents.

Table 32.1 : Gender Distribution of the Respondents

Gender	Frequency	Percent
0	4	1.73
1	82	35.49
2	144	64.01
Total	230	100.00

You can now convert coding into words and your final table (see Table 32.2) would look as below.

Table 32.2 : Gender Distribution of the Respondents

Gender	Frequency	Percent
No Reply	4	1.73
Male	82	35.49
Female	144	64.01
Total	230	100.00

Similarly, you can present the above findings into pie diagram as presented in the following figure (Figure 32.4).

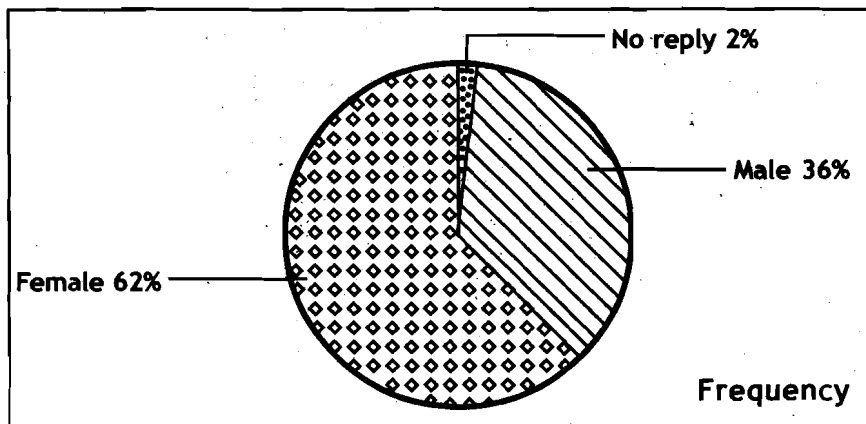


Figure 32.4 Gender distribution of the respondents.

Data from the Windows can be transferred to the report on your word processor through clipboard. If you are transferring the data from Excel to Word, the data will be imported already formatted as a basic Word table, which you can then visually increase or decrease its size. Graphs from Excel can also be transferred to your report through clipboard, using cut and paste.

Case II: Data collection and presentation through Audio

We are presenting here our own experience on data collection and presentation through audio. We interviewed sixty students for our research study on drop out. Respondents' phone numbers were located and they were contacted to take part in a face-to-face recorded interview at their respective home. On confirmation, we visited their homes as per their convenience, and recorded their responses to a structured interview schedule.

We recorded thorough tape recorder and translated into about fifty pages. One interview was about one page of transcription. We were faced with an enormous pile of interview transcriptions each of which covered the issue of any interview schedule, but in no particular order.

Once data transcribed, we found that we rarely returned to the tapes. Hesitation, coughing and personal and irrelevant discussion were indicated in the original transcriptions. Although these were not used in the final presentation of findings, we listened to the tape again, it sounded different. For a micro study (or dissertation for master programme), it is worth thinking carefully about whether it is necessary to complete the full transcriptions of taped material or not. In fact, transcriptions could be reserved for sections, which are particularly relevant to the study. The printed version and recorded version were matched for accuracy, consistency and prioritization. The recorded data was further categorized into four areas and presented in Table 32.3.

Table 32.3: Factors for dropout

Situational factor	Dispositional factor
<ul style="list-style-type: none"> ❖ Office work pressure (5) ❖ Family responsibility (3) ❖ Timing for practical classes were not suitable (2) ❖ Got married (3) ❖ Exam date clashed (9) ❖ Not doing well during exams (1) ❖ Admission in other programme (4) ❖ Husband got transferred (1) ❖ Due to extended family (1) 	<ul style="list-style-type: none"> ❖ 2nd preference to CIC programme (1) ❖ Felt inferiority complex during classes when junior was taking classes (1) ❖ Not aware about the exam date sheet (1)
Institutional factor	Course related factor
<ul style="list-style-type: none"> ❖ Not received hall ticket (1) ❖ Study centre changed (5) ❖ No information from regional centre for classes (4) 	<ul style="list-style-type: none"> ❖ Course was easy (1) ❖ Course was difficult (1) ❖ Language was difficult (1)

Source: Panda et al. (2004) *Study on Programme Completion, and Learner Persistence and Dropout in Distance Education*, IGNOU, New Delhi

Case III: Online case study

Research through virtual mode can be conducted through one to one e-mail or by hosting the questionnaire on a web page. This method provides quick feedback and access to geographically dispersed respondents. In addition, the online interviews and e-mail messages provided automatic text transcripts of all the interviews and

communications. You can see from the following illustrations how research data is presented with virtual or digital mode®.

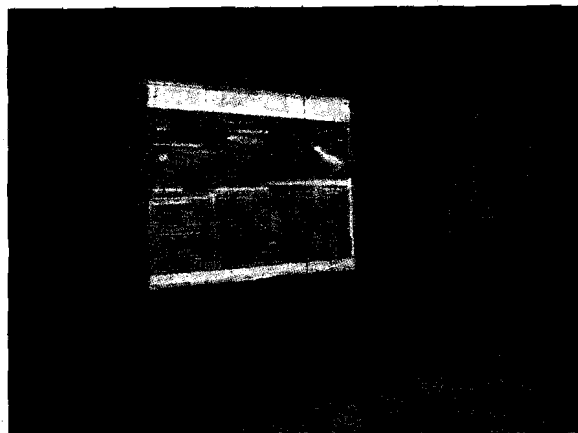


Figure 32.5: Presentation of Research Findings through Virtual Mode

Figure 32.6
Researcher editing
data through the
internet.

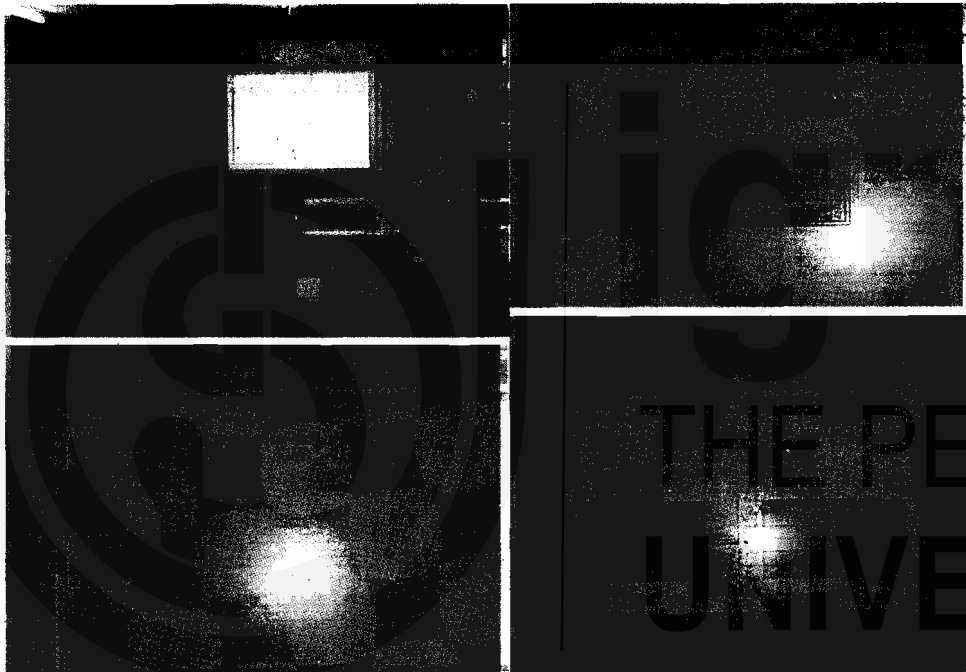


Figure 32.7 Presentation of research findings through multimedia.

In addition to the above mode of research presentation, you can also use self-paced learning and self-assessment using software/CD-Rom.

Case IV: Presentation of Research Findings in CD-Rom

We have presented a case study of data analysis and presentation in CD Rom. We are giving you a CD with this unit in which you can see how the actual data is coded, analysed and presented in the CD. The researcher conducted a study on "Pre-Testing Self-Instructional Material". The researcher collected feedbacks from ten respondents through face to face, analysed and presented his data research findings.

You can also present your experiment data or research findings by using power point and interactive whiteboard. You can collect and disseminate research data by using the devices of the web. But you should have Internet and research skills for the your presentation of research findings through the Internet.

32.5 Qualitative Data Analysis and Presentation through Computer Software

In addition to Excel, SPSS and SAS, other software packages are also available which are being used for qualitative data analysis and presentation, for example computer-aided methods for qualitative data analysis (CAQDAS). CAQDAS have two programmes like NUD-IST (non-numerical, unstructured data indexing-searching theorizing) and innovative and imaginative computer software application (ATLAS.ti). The purpose of these programmes is to show that even at micro research study, where the number of interview data is limited, these programmes may be used. You can download this software free from <http://www.scolari.co.uk>

NUD-IST: This programme has more complex features, which can be learned or ignored as the user develops familiarity with the software. Textual data are imported into NUD-IST as separate documents. These data can be coded which makes sense of the data. All the data under this category (or code) can be retrieved and then turned into a separate document. For detail you can study an introductory tutorial of this software.

WinMax: Some packages allow direct entry into the system while others will operate only with imported files. Some allow external files incorporating video and other material to be indexed. This makes the programme more complex. A much more user friendly programme is WinMax. It is easy to learn. It can be used for straightforward code-and-retrieve operations on text files as well as for the more difficult approaches of grounded theory and case oriented quantification. It also help you to work with qualitative and quantitative data simultaneously.

ATLAS.ti: It is an innovative and imaginative computer software application that allows you to study and analyse text. The text can be interview transcripts. You have to add additional coding so that it is easy to categorize or code short or long text segments for comparative study. For details, you may visit www.atlasti.de/demo.shtml, You can also present your findings of the interview data which have been recorded on tape. You can analyse the audio transcripts with this software.

CAQDAS programme makes you analyse a vast amount of data to be handled, while coding and retrieving can now be accomplished with remarkable speed and efficiency.

32.6 Types of ICT used for Research

In the previous units of Block 8, you have studied the application of ICT in social science research. In the present section, you will study the different types of ICT being used in research activities. These are:

- ❖ Online surveys
- ❖ Open ended or structured text-based interviews conducted via email or computer-mediated conferencing
- ❖ Focus groups using real time Net-based video, audio conferencing or asynchronous computer conferencing
- ❖ Net-based telephone interviews
- ❖ Analysis of text transcripts* of learning or social activities
- ❖ Analysis of social behavior in virtual reality environments
- ❖ Online assessment and/or evaluation of performance or knowledge, web cams.

A researcher can submit his ideas through different types of ICT and develop his ideas to become full resources for use in research activities. ICT also helps the researcher to join a discussion from where he or she can exchange views and join in collaborative research activities. For example DEOS-L@LISTS.PSU.EDU. You can present your research findings in a suitable medium of ICT in which audience can access a full text on the Internet in a choice of formats.

There is no ready-made programme/software available for the analysis and presentation of your research findings. There are various considerations to bear in mind when matching the kind of research study and database to the most suitable software.

The selection of the right programme depends upon the size of the database. If you have interviewed just four to five individuals and transcribed the text, CAQDAS may not be useful. This package handles large quantities of data in different files much faster than you could do it by your own hand. You should have a minimum of fifteen cases to use this software. If data is obtained from several sources like documents, observation, questionnaires and audio and video, some software can handle the diversity of data types and others not. In some packages it is easy to revise the text database, but in others revising takes much time. For example, a file imported into CAQDAS cannot be changed. It would be necessary to make the changes in Word and then re-import the file.

Therefore, the selection of the software depends upon the size of the database, nature of data (i.e. structured or unstructured), technical knowledge of the researcher, time and cost.

Similarly, the selection of the ICT for the presentation of your research findings depends upon these factors and the availability of the particular technology to the audience.

Adobe Reader software can help you view, print, and share your research document more securely by using a variety of platforms and devices. For details you may visit <http://www.adobe.com>. There are various Web

pages available which provide free space to share your research findings. See, for example, www.yahoo.com.

32.7 Conclusion

The foregoing details apprise you of the cases of presentation of your research findings with different types of ICT sources. This discussion and information was based on the assumption that you have a basic awareness of the writing skill and statistical package. We have focused in this unit on the presentation and dissemination of your research findings through ICT. How to code, edit and present research data has been presented in this unit. In addition to this, how data is collected through tape recorder and transcribed into text are also presented.

Further Reading

Gentleman, Jane F. 2004. *The National Health Interview Survey*. In National Health Interview Survey Presentations of the 2004 Listing of Selected Presentations at http://www.cdc.gov/nchs/howto/events/duc2004/ducpresentations_2004.htm

Unit 33

Guidelines to Research Project Assignment

Contents

- 33.1 Introduction
- 33.2 Overview of Research Methodologies and Methods (MSO 002)
- 33.3 Research Project Objectives
- 33.4 Preparation for Research Project
- 33.5 Stages of the Research Project
- 33.6 Supervision During the Research Project
- 33.7 Submission of Research Project
- 33.8 Methodology for Evaluating Research Project
- 33.9 Conclusion



Learning Objectives

It is expected that after reading Unit 33, you would be able to get the following guidance to successfully complete one of the assignments of MSO 002.

- ❖ Obtain an overview of the course material of MSO 002.
- ❖ Understand the objectives of undertaking a research project.
- ❖ Begin preparations for planning and carrying out the research project.
- ❖ Work out the various stages of the research.
- ❖ Seeking help to overcome problems, if any, during the research.
- ❖ Be informed about the submission and evaluation methodology of the research project.

33.1 Introduction

I hope that you have read in Book 1 the Introduction to MSO 002, where we mentioned on page xii that the first tutor marked assignment of MSO 002 would comprise a 5,000-word report on a small fieldwork-based research project on one of the subjects listed in the assignment booklet of MSO 002. Alternatively, you may choose your own subject of research. Unit 33 aims to provide you some guidelines to research project assignment. In addition, you may consult your academic counsellor at the Study Centre assigned to you.

33.2 Overview of Research Methodologies and Methods (MSO 002)

It is useful to repeat what you have already read in Book 1 about organisation of the course material of MSO 002. This will provide a bird's eye view of what you have already read in MSO 002 and it is expected

that you will now be able to put into practice what you have learnt in the pages of MSO 002 course material. As explained earlier, the objective of MSO 002 is to train its learners to become good researchers and investigators of the social reality around us.

All attempts to make social research scientifically valid involve clarity of perspectives or orientations that guide one's quest for collection of facts and all such clarity is worthwhile only when it accompanies scientific methods and techniques of collecting and analysing/ interpreting facts. Then comes the documentation and presentation of one's analysis in technical summaries and reports or research publications. Following this very sequence, the second course of M.A. Sociology of IGNOU, (MSO 002) has been divided into three books.

❖ **Book 1, *Research Methodologies*:** Book 1 traces the philosophical roots of current methodologies in social research and sensitises its learners to take a critical look at them for obtaining conceptual clarity. It has three blocks, with eleven units.

❖ **Book 2, *Quantitative and Survey Methods*:** Book 2 deals with the study of a) research methods as a way to understand social phenomena and b) statistical and survey methods of gathering, organizing and analysing the data collected.

❖ **Book 3, *Qualitative Methods and Presentation of Research Findings*:** Book 3 is concerned with qualitative methods of research and writing up the findings of the research. In addition, as a novel input to a research methods course, the book covers the applications of the tools that information technology has made available to social science researchers for analysing and presenting their research data.

Having completed your reading of the units in the three books of MSO 002, you are now fully sensitised to the need of critically looking at different perspectives, methods and techniques of social research. You have reached the stage when you can receive an exposure, however limited, to fieldwork that would inculcate in you the spirit of inquiry through real life experience of sociological research.

33.3 Research Project Objectives

The objective of the Research Project is to provide you with an opportunity to utilise the knowledge and apply the skills gained from the three books of MSO 002 so that you may be able to use social science research methodologies and methods in the world of work and for pursuing research degrees like M. Phil. and Ph. D. in the social sciences. You would need to read the contents of the three books in detail from the point of view of the subject of your research project. You would study in depth the relevant theoretical foundations, appropriate methods and techniques for carrying out field research in order to generate your own data. In

the process, you may come across constraints at any stage of your research project. You would need to overcome those constraints and present the results of your research in about five thousand words. This discussion would take us to the next section of this unit, that is, preparing for the research project.

33.4 Preparation for Research Project

Here we give, in brief, the main stages of the research project and in the next section you will read their details.

❖ The planning stage

This stage begins as soon as you enrol for MSO 002. The effort you put into your research project would be optimum if you work systematically. Some of the steps that you need to follow are listed in the next section for your reference. Just to start with a few of them are

- a) Start a diary or a logbook to systematically record the process and activities you undertake throughout the research project.
- b) Identify and determine the theme for your research project within six to ten weeks of receiving your learning material of MSO 002 by browsing through each of the three books.
- c) Start making entries in your diary/ logbook[®]. This will help you in later stages of your research.
- d) Consult the academic counsellor and discuss with her/ him the feasibility of carrying out your research.
- e) Give yourself some degree of flexibility for changing your research topic. This should of course be done keeping in mind the time and resources available at your end.
- f) Visit the libraries close to the place of your residence for consulting the books in the reading list suggested by the social scientists you had spoken to.

The above steps would be enough to get going with your research project. You would now be ready for the second stage of your research.

❖ Working on the Research Project

- a) Getting an overview of your research project through a review of secondary data[®]
- b) Contextualising general observations with the objectives of your research project
- c) Description of case study projects, if any
- d) Identifying the key actors/ informants/ participants and their social networks
- e) Selecting method(s) for data gathering and analysis

- f) Data analysis
- g) Drawing conclusions

After working on your research project will come the stage of putting it down on paper or let us say that this is the stage of writing up your material.

❖ **Research Project Report**

- a) Writing or typing the report
- b) Selecting the format of the report
- c) Organising accordingly the presentation of the data and its analysis.

Going through the above three stage of the research project will see you build a capacity for conducting a social research. We will now discuss in detail all stages of research including the above three mentioned in this section.

33.5 Stages of the Research Project

The discussion in this section is to give you guidelines so that you are able to carry out the research in a systematic and confident manner without any apprehension and fear of failure. Let us begin with the first stage.

❖ **Stage 1: Planning stage**

At the planning stage, you will need to accomplish the following four tasks in a careful manner. This is so because good planning is likely to provide you a clear and concise understanding of what you are going to do.

- i) Work out a timetable for completing the reading of the three books of MSO 002. Along with this task, plan your timetable for carrying out all your assignments and make a conscious effort to maintain your work progress as planned. Make sure to assign some time for research project in your timetable.
- ii) Exploring options for individual research project would entail the following steps.
 - a) You would need to explore options for an appropriate topic from the list in the assignment booklet. Because of the time constraints and demands of your other than study responsibilities, like a job, family obligations etc, it would be most appropriate if you select a research topic that is contextualised in the area of your work or residence. In this matter you need to first decide your area of interest, for example, environment, ecology, natural resources, education, minority communities, socially marginalised groups, girl child, working women, family, marriage and kinship etc. (the list can be a really long one).

- b) After selecting the theme or an area of your interest, you can proceed to determine the nature and location of your research. As per your convenience you need to conduct field research in a manner that does not make a heavy demand on your time, energy and resources as you have many other tasks to complete during the course of your study at IGNOU.
- c) The next task is to determine the extent, quality and type of secondary data available, as there has to be ample background information on your research topic to give you an understanding of the social processes involved in taking the situation to its current state. This would require you to collect secondary data from various sources. You only need adequate data to get a clear picture of the current status of the social situation so that you can contextualise your own research project.
- iii) Making an arrangement with the academic counsellor at your Study Centre to seek help and advice when you feel the need for a discussion on your research or when you find that you are facing some difficulty in carrying out your research.
- iv) Preparing a research proposal. This needs to be a brief statement with the following heads.
 - a) Title of Research Project
 - b) Purpose and Objectives of Research
 - c) Research Methods
 - d) Time Frame

You can discuss the research proposal with your academic counsellor and consider it once more from the point of view of the time and resources available to you for completing the research. Make modifications, if any, at this stage and once you have begun working on it make efforts to stick to your plan. If you keep making changes again and again, you will waste time, energy and resources without achieving much. The evaluation of this assignment will focus on the efforts made by you rather than on achieving a superbly finished product. That you may do after completing your master's programme in sociology.

❖ Stage 2: Actual Carrying out of Research

The details of the following depend mostly on the type of research you undertake. Here are the five steps you can take in order to execute your research plans.

- i) **Determine data requirements**
The data you will require will relate to
 - a) Relevant Acts and policies, if any, existing about the topic of your research
 - b) Maps and other visual materials

- c) Census enumeration of the general/ particular area of research
- d) Socio-economic survey of sample population to prepare a profile of the people
- e) Socio-cultural, economic and political issues identified through participatory methods
- f) Institutional structure, procedures and processes
- g) Case-study or extended method report to reflect social change and/ or conflict

ii) Prepare for data collection

You need to find out if there is existing data available on the topic of your research and whether it would be suitable for your research project. It is necessary to determine and record who collected the data, when it was collected and how reliable the information is. You need to remember to note the following details about every source of information you refer to

- a) Full title of the document, book, journal, map, etc
- b) Author, department, agency that has prepared the document, book, journal, map etc
- c) Date/ year when the document, map, etc , was prepared
- d) Date/ year when the document, book, journal, map was published
- e) Edition, place of publication and publisher for books and articles

After this initial exercise, determine the specific requirements for additional data that may pertain to both primary and secondary data for achieving the objectives of your research.

iii) Identify secondary data sources

Sources can range from newspapers, books, and articles to specialists in the area of your research in public life, administrative bureaucracy, and the Internet search options.

iv) Data collection and methods

Before you begin data collection, review the requirements you have identified for primary data and discuss with the academic counsellor about the need to collect primary data. Clearly define what you need and for what objectives. Then determine the most appropriate data collection method. It is necessary to go through the following steps in order to ensure that the data analysis presented in your research project report is reliable. For this purpose you need to explain and justify

- a) The design of the survey questionnaire form or the appropriateness and selection of participatory technique or tools used for specific data collection
- b) Method of field work including how persons helping in your research were identified and how they were briefed/ trained to help you with the survey work

- c) Process followed for field supervision and/ or recording, verification and quality control
- d) How data was processed, including use of any computer software packages and how it was analysed

❖ **Stage 3: Research Project Report**

Once you have collected data and analysed them, you will need to prepare the report by systematically reporting your work as per the following steps.

i) Report components

The research project report has the following two components.

- a) The logbook or diary that you maintained as an aid for actual preparation of the report (this is only as an evidence of your systematic pursuit of your research)
- b) The written report and the documentation in a medium of your choice, including written text, video film, photographs etc

ii) Report format and organisation

The format of report and documentation needs to follow the structure given below.

- a) **Cover page:** The first page of the report is to indicate the titles of your research project, name and location of the place where fieldwork was carried out and your name with your enrolment number.
- b) The second page is to carry a summary of your research project in less than 300 words.
- c) The third page is to give acknowledgements
- d) The fourth page is to list alphabetically a list of abbreviations
- e) The fifth page is to provide the table of contents, including list of tables, maps and figures/ illustrations
- f) From the sixth page onward, you need to give first an introduction to your research project, its approach, including key issues that determined selection of the research project
- g) Next in order of presentation will be the description of techniques or methods adopted for data collection and analysis
- h) Then would come stating findings from your research
- i) After stating the findings, you need to put down the conclusions drawn.
- j) In the end, you need to give a list of references in the manner you find in the three books of MSO 002. This means that the list should be arranged alphabetically by the author's surname followed by initials or forename(s) and the year of publication of the particular

book/ article/ other document, full title of the document, which has to be italicised. This should be followed by the name of the publishing firm and place of publication. You need to take care to mention the sources of data or quotations, whether from books, journals, other published and unpublished documents and websites referred to in the research project report. Please note that this is an important aspect of your research project assignment and take care to pay attention to this in order to obtain better grades.

- k) Please keep in mind that when abbreviating names of organisations, terms etc in the written text, provide the name in full form when you mention it for the first time with the abbreviated form in brackets. Subsequently, use the abbreviated form. All abbreviations in the text should be listed on the fourth page of your report along with their full forms stated.

iii) Language and editing

The research project report is to be written in the language that has been opted for by you for completing MSO 002. All the report material like photographs, films, etc, should have the same language scripts. It is a very good idea to write the first draft and then edit it both in terms of its content and language. You may also like to give it to your co-learners of MSO 002 for their comments and suggestions for modifications and you may extend a similar gesture to them. This will help you to refine the presentation of your report.

33.6 Supervision During the Research Project

You will be basically working on your research project on your own but you can always discuss your problems with the academic counsellor at your study centre as well as with your co-learners. There is no formal arrangement for supervision of this practical exercise of MSO 002. You are required mainly to consult the course material of MSO 002 and carry out your research at a modest level so that this exercise gives you a taste of what it is like to do research. You need not make it a too time-consuming and lengthy exercise.

33.7 Submission of Research Project

The written report should be submitted on A4 paper size format, typed in double spacing in a bound volume. The length of the report should be five thousand words, excluding appendices, other documents.

The report should be submitted at the Study Centre in the same manner as you would submit other assignments. Do not forget to retain a copy of the report with you. Obtain an acknowledgement receipt after submission of the report at the Study Centre.

If you allow your research work report to be copied by your co-learners for submission as their reports, you and those who submit such copies would be disqualified and you and others will have to work all over again and produce another piece of work.

33.8 Methodology for Evaluating Research Project

Evaluation methodology of research project report is as follows.

The evaluation will be done at the Study Centre by the same evaluator who would evaluate other assignments of MSO 002. The assignment of the research project will carry a weight similar to assignment 1 of other courses of Master's Programme in sociology. The per cent of total marks of this assignment will be distributed as given in Box 31.1.

Box 31.1 Distribution of total marks of Assignment 1 of the Research Project

- i) Diary or logbook documenting the process of fieldwork-based research 20 per cent
- ii) Clarity of topic, language, coherence, style etc 20 per cent
- iii) Clarity of objectives and methodology as well as methods 20 per cent
- iv) Understanding and practice of fieldwork-based research 20 per cent
- v) Extent to which the learning objectives of the each of the three books of MSO 002 are reflected in the body of the research project report 20 per cent.

33.9 Conclusion

Unit 33 has provided you guidelines to undertake a mini research project as one of the assignments of MSO 002. The inputs in this unit are considered to be fairly adequate for the need of carrying out a fieldwork-based research of modest proportions.

In case, you face problems in completing this assignment, you are recommended to consult your academic counsellor and/ or the co-ordinator of MSO 002 at headquarters in IGNOU, Maidan Garhi, New Delhi.

I wish you best of luck for completing the assignment and also the full course of MSO 002.

Further Reading

Read once more your own research project and try to improve it in terms of style, language and substantive content.



Glossary

(Explanations of glossary words have been prepared with the help of information available on the Internet and in other sources.)

Animations: The word refers to the act, process, or result of imparting life, interest, spirit, motion, or activity. In the context of the MSO 002 text, it refers to the art or process of preparing animated cartoons.

Anonymisation: It refers to the process of giving pseudonyms to persons/ places in order to hide their identity. This is a regular practice among social scientists who often work on sensitive topics and disclosing the identities of real persons/ places may in some cases give rise to problems of moral and ethical nature and in such circumstances taking recourse to anonymisation may be necessary.

Bar Charts: Bar Charts, like pie charts, are useful for comparing classes or groups of data. In bar charts, a class or group can have a single category of data, or they can be broken down further into multiple categories for greater depth of analysis. Bar charts are familiar to most people, and interpreting them depends largely on what information you are looking for. You might look for:

- ❖ the tallest bar.
- ❖ the shortest bar.
- ❖ growth or shrinking of the bars over time.
- ❖ one bar relative to another.
- ❖ change in bars representing the same category in different
- ❖ classes

Watch out for inconsistent scales. If you're comparing two or more charts, be sure they use the same scale. If they don't have the same scale, be aware of the differences and how they might trick your eye.

Be sure that all your classes are equal. For example, don't mix weeks and months, years and half-years, or newly invented categories with ones that have trails of data behind them.

Be sure that the interval between classes is consistent. For example, if you want to compare current data that goes month by month to older data that is only available for every six months, either use current data for every six months or show the older data with blanks for the missing months.

For each bar in the bar chart, the following statistics are useful:

Mean	the average height of all the bars.
Maximum	the maximum value (tallest bar) in the series.
Minimum	the minimum value (shortest bar) in the series.
Sample Size	the number of values (bars) in the series.
Range	the maximum value minus the minimum value.
Standard Deviation	Indicates how widely data is spread around the mean.

Bivariate: The term refers to the fact of having two variables, for example bivariate binomial distribution.

Boolean: The term refers to a logical combinatorial system treating variables, such as propositions and computer logic elements, through the operators AND, OR, NOT, and

XOR, a browser that supports Boolean searches. It relates to a data type or variable in a programming language that can have one of two values, true or false.

The term is named so after George BOOLE.

Browser or Web browser: It is the program that serves as your front end to the Web on the Internet. In order to view a site, you type its address (URL) into the browser's Location field; for example, www.computerlanguage.com, and the home page of that site is downloaded to you. The home page is an index to other pages on that site that you can jump to by clicking an underlined hyperlink or an icon. Links on that site may take you to other related sites.

Browsers have a Bookmark or Favorites feature that lets you store references to your favorite sites. Instead of having to type in the URL to visit the site again, you select the bookmark. It Started with Mosaic. The Mosaic browser put the Web on the map in 1993, but by the mid 1990s, Netscape Navigator (commonly called "Netscape") had 80% of the market. Vying for top spot, Netscape and Microsoft's Internet Explorer (IE) constantly added new features and functions that fragmented Web sites into competing camps. Today, IE, which is included with every Windows PC, has approximately 90% of the market. Netscape is still popular among devotees, and it wound up spawning Mozilla and Firefox, the latter gaining a lot of attention when released in 2004. Opera also has a nice following, and Safari is the browser for Mac OS X.

When a site says "best viewed by Netscape" or "best viewed by Internet Explorer," it means that the pages were programmed for that particular browser. Using the other browser will ignore some of the page's visual features until a subsequent release supports them. See Mosaic, Opera, Mozilla, Firefox, Safari, hyperlink, World Wide Web, HTML and microbrowser.

Chi-square test: Chi-square test is a test that uses the chi-square statistic to test the fit between a theoretical frequency distribution and a frequency distribution of observed data for which each observation may fall into one of several classes.

"Clickability": Clickability works with organizations online who want to generate revenue, reduce costs, and strengthen relationships with their audience. Clickability provides solutions and tools for enhancing user interactivity, managing content, and improving navigation.

Code: As a noun the word refers to the stuff that software writers write, either in source form or after translation by a compiler or assembler. Often used in opposition to "data", which is the stuff that code operates on. Among hackers this is a mass noun, as in "How much code does it take to do a bubble sort?", or "The code is loaded at the high end of RAM." Among scientific programmers it is sometimes a count noun equivalent to "program"; thus they may speak of "codes" in the plural. Anyone referring to software as "the software codes" is probably a newbie or a suit.

In the sense of writing a code, the word always refers to source code rather than compiled. "I coded an Emacs clone in two hours!" This verb is a bit of a cultural marker associated with the Unix and minicomputer traditions (and lately Linux); people within that culture prefer the verb 'code' to the verb 'program' whereas outside it the reverse is normally true.

In communications, a code is a rule for converting a piece of information (for example, a letter, word, or phrase) into another form or representation, not necessarily of the same sort.

In the history of cryptography, codes were once common for ensuring the confidentiality of communications, although ciphers are now used instead.

Codes in communication are used for brevity. Code can be used for brevity. When telegraph messages were the state of the art in rapid long distance communication,

elaborate commercial codes which encoded complete phrases into single words (commonly five-letter groups) were developed, so that telegraphers became conversant with such "words" as BYOXO ("Are you trying to weasel out of our deal?"), LIUUY ("Why do you not answer my question?"), BMULD ("You're a skunk!"), or AYYLU ("Not clearly coded, repeat more clearly."). Code words were chosen for various reasons: length, pronounceability, etc. Meanings were chosen to fit perceived needs: commercial negotiations, military terms for military codes, diplomatic terms for diplomatic codes, any and all of the preceding for espionage codes. Codebooks and codebook publishers proliferated, including one run as a front for the American Black Chamber run by Herbert Yardley between WWI and WWII. The purpose of most of these codes was to save on cable costs. The use of data coding for data compression predates the computer era; an early example is the telegraph Morse code where more frequently-used characters have a short representation. Techniques such as Huffman coding are now used by computer-based algorithms to compress large data files into a more compact form for storage or transmission.

Coding: Coding means to systematise and arrange (laws and regulations) into a code or to convert (a message, for example) into code. In Computer Science coding refers to write or revise a computer program. In communications and information processing, encoding is the process by which a source (object) performs this conversion of information into data, which is then sent to a receiver (observer), such as a data processing system. Decoding is the reverse process of converting data, which has been sent by a source, into information understandable by a receiver. It is an implementation of that rule (or algorithm) for coding and decoding, for example MP3, which may be a hardware implementation or a software implementation, and which may include compression.

One reason for coding is to enable communication in places where ordinary spoken or written language is difficult or impossible. For example, a cable code replaces words (e.g., ship or invoice) into shorter words, allowing the same information to be sent with fewer characters, more quickly, and most important, less expensively. Another example is the use of semaphore flags, where the configuration of flags held by a signaller or the arms of a semaphore tower encodes parts of the message, typically individual letters and numbers. Another person standing a great distance away can interpret the flags and reproduce the words sent.

Consistency: It refers to condition of adhering together or firmness of material substance. In the context of units of MSO 002, the word refers to ability to be asserted together without contradiction or agreement or harmony of parts or features to one another or a whole.

Content analysis: Content analysis (also called: textual analysis) is a standard methodology in the social sciences on the subject of communication content. Harold Lasswell formulated the core questions of content analysis: "Who says what, to whom, why, to what extent and with what effect?". Ole Holsti (1969: 14) offers a broad definition of content analysis as "any technique for making inferences by objectively and systematically identifying specified characteristics of messages".

The method of content analysis enables the researcher to include large amounts of textual information and identify systematically its properties, e.g. the frequencies of most used keywords (KWIC = Keyword In Context) by detecting the more important structures of its communication content. Yet such amounts of textual information must be categorised according to a certain theoretical framework, which will inform the data analysis, providing at the end a meaningful reading of content under scrutiny. David Robertson (1976: 73-75) for example created a coding frame for a comparison of modes of party competition between British and American Parties. It was developed further in 1979 by the Manifesto Research Group aiming at a comparative content-analytic approach on the policy positions of political parties. This classification scheme

was also used to accomplish a comparative analysis between the 1989 and 1994 Brazilian party broadcasts and manifestos by F. Carvalho (2000).

The creation of coding frames is intrinsically related to a creative approach to variables that exert an influence over textual content. In political analysis, these variables could be political scandals, the impact of public opinion polls, sudden events in external politics, inflation etc. Mimetic Convergence, created by F. Carvalho for the comparative analysis of electoral proclamations on free-to-air television is an example of creative articulation of variables in content analysis. The methodology describes the construction of party identities during long-term party competitions on TV, from a dynamic perspective, governed by the logic of the contingent. This method aims to capture the contingent logic observed in electoral campaigns by focusing on the repetition and innovation of themes sustained in party broadcasts. According to such post-structuralist perspective from which electoral competition is analysed, the party identities, 'the real' cannot speak without mediations because there is not a natural centre fixing the meaning of a party structure, it rather depends on ad-hoc articulations. There is no empirical reality outside articulations of meaning. Reality is an outcome of power struggles that unify ideas of social structure as a result of contingent interventions. In Brazil, these contingent interventions have proven to be mimetic and convergent rather than divergent and polarised, being integral to the repetition of dichotomised worldviews.

The Process of a Content Analysis

According to Klaus Krippendorff (1980 and 2004), six questions must be addressed in every content analysis:

- ❖ Which data are analysed?
- ❖ How are they defined?
- ❖ What is the population from which they are drawn?
- ❖ What is the context relative to which the data are analysed?
- ❖ What are the boundaries of the analysis?
- ❖ What is the target of the inferences?

According to Zipf Law, the assumption is that words and phrases mentioned most often are those reflecting important concerns in every communication. Therefore, quantitative content analysis starts with word frequencies, space measurements (column centimetres in the case of newspapers), time counts (for radio and television time) and keyword frequencies. However, content analysis extends far beyond plain word counts, e.g. with KWIC routines words can be analysed in their specific context to be disambiguated. Synonyms and homonyms can be isolated in accordance to linguistic properties of a language. Qualitatively it can involve any kind of analysis where communication content (speech, written text, interviews, images) is categorised and classified. While on its start with the first newspapers at the end of 19th century, it was done by manually measuring the amount of lines and space e.g. on newspapers. With the rise of common computing facilities like PCs, computer based methods of analysis are growing in popularity. Answers to open ended questions, newspaper articles, political party manifestoes, medical records or systematic observations in experiments can all be subject to systematic analysis of textual data. By having contents of communication available in form of machine readable texts, the input is analysed for frequencies and coded into categories for building up inferences. Weber (1990: 12-14) notes: "To make valid inferences from the text, it is important that the classification procedure be reliable in the sense of being consistent. Different people should code the same text in the same way". The validity, inter-coder reliability and intra-coder reliability are subject to intense methodological research efforts over long years (see Krippendorff, 2004).

One more distinction is between the manifest contents (of communication) and its latent meaning. "Manifest" describes what (an author or speaker) definitely has written, while latent meaning describes what an author intended to say/write. Normally, content

analysis can only be applied on manifest contents, that are the words, sentences, texts in general.

A further step in analysis is the distinction between dictionary-based (quantitative) approaches and qualitative approaches. Dictionary-based approaches set up a list of categories derived from the frequency list of words and control the distribution of words and their respective categories over the texts. While methods in quantitative content analysis in this way transform observations of found categories into quantitative statistical data, the qualitative content analysis focuses more on the intentionality and its implications.

Copycat: One that closely imitates or mimics another. When used as an adjective, the word refers to closely imitating or following another: a copycat version of a successful product; a copycat crime.

Cursor: In Computer Science the word means a bright, usually blinking, movable indicator on a display, marking the position at which a character can be entered, corrected, or deleted.

Cyber café: The words refer to a cafe from which customers can access the Internet. It refers also to a chatroom.

Database: A collection of data arranged for ease and speed of search and retrieval. Also called data bank.

Debriefing: The term refers to the act or process of debriefing or of being debriefed or the information imparted during the process of being debriefed.

Demographers: The word refers to persons who engage in the study of the characteristics of human populations, such as size, growth, density, distribution, and vital statistics.

Diachronic: The word is concerned with phenomena, such as linguistic features, as they change through time. The word is used to describe the study of a phenomenon as it changes through time.

Dialectic: The history of the term dialectic would by itself constitute a considerable history of philosophy. Briefly, the term "dialectic" owes much of its prestige to its role in the philosophy of Plato, where it figures as the logical method of philosophy in the Socratic dialectical method of cross-examination. The term was given new life by Hegel, whose dialectically dynamic model of nature and history made it, as it were, a fundamental aspect of the nature of reality (instead of regarding the contradictions into which dialectics leads as a sign of the sterility of the dialectical method, as Kant tended to do in his *Critique of Pure Reason*). In the mid-nineteenth century, the concept of "dialectic" was appropriated by Marx (see, for example, *Das Kapital*, published in 1867) and Engels and retooled in a non-idealist manner, becoming a crucial notion in their philosophy of dialectical materialism. Thus this concept came, for a time, to play a prominent role on the world stage and in world history. Today, "dialectics" can also refer to an understanding of how we can or should perceive the world (epistemology), an assertion of the interconnected, contradictory, and dynamic nature of the world outside our perception of it (ontology), or a method of presentation of ideas or conclusions. Basically, it is the art or practice of arriving at the truth by the exchange of logical arguments.

Dialog: Dialog refers to the first commercial online information retrieval system, created by Roger Summit in 1967 and launched as a service in 1972. For years, DIALOG has offered the largest single collection of information available online, claiming over 900 databases in areas such as business, science, finance and law. Searching is free, but there are fees for viewing the results. Access is available via the Web or by separate dial-up numbers as was the norm before the Internet became popular. DIALOG's searchable content is considered to be part of the deep Web

Digital mode: The word "digital" is commonly used in computing. A digital system is one that uses discrete values rather than a continuous spectrum of values: compare analog.

The word comes from the same source as the word digit: the Latin word for finger (counting on the fingers) as these are used for discrete counting.

The distinction digital versus analog can refer to data storage and transfer, the internal working of an instrument, and the kind of display. A system working with discrete values would be described as bring in digital mode.

Discourse analysis: Discourse analysis is any of a number of approaches to analysing language use beyond the sentence or clause level. The language in question can be written or spoken texts or systems of texts. The term discourse analysis first entered general use in a paper published by Zellig Harris in 1952.

The concept of discourse analysis has been taken up in a variety of disciplines, including linguistics, anthropology, sociology, and social psychology, each of which is subject to its own assumptions and methodologies. The following are some of the specific theoretical perspectives and analytical approaches used in linguistic discourse analysis:

- ❖ Interactional sociolinguistics
- ❖ Ethnography of communication
- ❖ Pragmatics, particularly speech act theory
- ❖ Conversation analysis, which is based on the theories of Harvey Sacks
- ❖ Variation analysis
- ❖ Discursive psychology, particularly as developed by Jonathan Potter.

Critical discourse analysis combines discourse analysis with critical theory (particularly that of the Frankfurt School and Michel Foucault, as well as literary, semiotic and psychoanalytic influences from Julia Kristeva, Roland Barthes, and Jacques Lacan), to create a politically engaged form of linguistic discourse analysis.

Although each approach emphasises different aspects of language use, they all view language as social interaction, and are concerned with the social contexts in which discourse is embedded. In the social sciences discourse analysis has come to occupy a significant place.

Elicitory: The word means to bring or draw out (something latent); *eluce*. It also means to arrive at (a truth, for example) by logic or to call forth, draw out, or provoke (a reaction, for example).

Ethnographer: Ethnographer is a person who engages with the branch of anthropology that studies the scientific description of specific human cultures.

Ethnomethodology: It is the branch of sociology that deals with the codes and conventions that underlie everyday social interactions and activities.

Fieldwork: Fieldwork is the work done or firsthand observations made in the field as opposed to that done or observed in a controlled environment. In the context of the units of MSO 002 the word refers to the collecting of sociological or anthropological data in the field.

Folklorist: The word means a person who engages in the study of traditional customs, tales or sayings preserved orally among a people. Folklore is a comparative science that investigates the life and spirit of a people as revealed in their folklore.

Footnote: Footnote is a note placed at the bottom of a page of a book or manuscript that comments on or cites a reference for a designated part of the text. It is something related to but of lesser importance than a larger work or occurrence: for example, a political scandal that was but a footnote to modern history. As a verb it is used to denote furnishing with or comment on in footnotes.

Foucault: Foucault, Michel (1926-1984) was a French philosopher and historian who explored the role played by power in shaping knowledge. His works include *Madness and Civilization* (1961) and the multi-volume *History of Sexuality* (1976-1986). He was

professor at the Collège de France (1970-84).

Gatekeepers: The word refers to those in charge of passage through a gate. In the context of the units of MSO 002, it refers to those who monitor or oversee the actions of others and are therefore important persons of the community (proposed to be the subject of study by a sociologist/ anthropologist).

Glacier: The word refers to a huge mass of ice slowly flowing over a land mass, formed from compacted snow in an area where snow accumulation exceeds melting and sublimation.

Grounded theory: It is a general research method for behavioural science developed by two sociologists. One was Barney Glaser (b. 1930), who was trained in quantitative sociology by Paul Lazarsfeld. The other person was Anselm Strauss (1916-1996), who was trained in symbolic interactionism by Herbert Blumer. The successful collaboration of Glaser and Strauss in research on dying in hospitals evolved into the “constant comparative method”, or grounded theory (GT). The name underscores the generation of theory from data.

GT is the most quoted method by researchers doing qualitative data analysis in the world according to database searches (Google, Medline, CINAHL, PsycLit, Econlit).

Most chapters in the first GT methodology “The Discovery of Grounded Theory” (Glaser & Strauss, 1967) were written by Glaser, trained in methodology generation. Glaser alone wrote the second methodology “Theoretical Sensitivity” (Glaser 1978) and has since written five more books on the method and edited five readers with a collection of GT articles and dissertations. The Grounded Theory Review is a peer-reviewed journal publishing grounded theories and articles on different aspects of doing GT.

Strauss and Juliet Corbin (Strauss and Corbin 1990) took GT in a different direction from what Glaser had outlined in Theoretical Sensitivity and the 1967 book. There was a clash of ideas between the discoverers and Glaser in 1992 wrote a book arguing against the Strauss and Corbin book chapter by chapter. Hence GT was divided into Strauss and Corbin’s method, and Glaser’s GT with the original ideas from 1967 and 1978 still in operation.

Hardware and software: Though in general hardware refers to metal goods and utensils such as locks, tools, and cutlery, in Computer Science it refers to a computer and the associated physical equipment directly involved in the performance of data-processing or communications functions. Software refers to the programs, routines, and symbolic languages that control the functioning of the hardware and direct its operation.

Histogram: It is a bar graph of a frequency distribution in which the widths of the bars are proportional to the classes into which the variable has been divided and the heights of the bars are proportional to the class frequencies. It is a charting format that displays horizontal or vertical bars. The length of the bars is in proportion to the values of the data items they represent. Many digital cameras use histograms to display the brightness of the image. Using 256 vertical bars to represent brightness levels from 0 to 255, the bar on the leftmost side of the chart is the darkest pixel level (0), and the rightmost bar is the lightest (255). The height of the bars represents the relative number of pixels in the image that contain that brightness level.

HTML: HTML is a markup language used to structure text and multimedia documents and to set up hypertext links between documents, used extensively on the World Wide Web. It is an acronym for Hyper Text Markup Language.

Imponderabilia: The term refers to that cannot undergo precise evaluation: imponderable problems.

Institution: In the context of the units of MSO 002, the term refers to a custom, practice, relationship, or behavioural pattern of importance in the life of a community or society, for example, the institutions of marriage and the family.

In general terms, the word means an established organisation or foundation, especially one dedicated to education, public service, or culture.

Interpretative social science: The second theme of Schutz's theory of the cultural sciences is the clarification of the categories or "basic concepts" of the sciences. To show what this is about, it is most efficient merely to quote the list on the first page of Schutz's *Aufbau* of the basic concepts of interpretative sociology that he then attempts to clarify in his book: "the interpretation of one's own and others' experiences, meaning-establishment and meaning-interpretation, symbol and symptom, motive and project, meaning-adequacy and causal adequacy, and, above all, the nature of ideal-typical concept formation." Investigation beyond Schutz's work should pursue similar concepts in other disciplines, beginning from the science-theoretical reflections of the scientists themselves while always being prepared to go further.

Interpretative sociology or verstehen: Interpretative Sociology (or *verstehen*, a German word for understanding, pronounced as though it rhymes with fair-stain) was used by Max Weber to describe a process in which outside observers of a culture (such as anthropologists) relate to an indigenous people on the observer's own terms. This concept has been both expanded and criticized by later social scientists. Proponents laud this concept as the only means by which researchers from one culture can examine and explain behaviours in another. While the exercise of *verstehen* has been more popular among social scientists in Europe such as Jürgen Habermas, *verstehen* was effectively introduced into the practice of sociology in the United States by Talcott Parsons, an American follower of Max Weber. Parsons incorporated this concept into his 1937 work, *The Structure of Social Action*.

Critics of *verstehen* such as Mikhail Bakhtin and Dean MacCannell counter that it is simply impossible for a person born of one culture to ever completely understand another culture, and that it is arrogant and conceited to attempt to interpret the significance of one culture's symbols through the terms of another (supposedly superior) culture.

IP address: IP address is an acronym for Internet Protocol address, which is the address of a device attached to an IP network (TCP/IP network). Every client, server and network device must have a unique IP address for each network connection (network interface). Every IP packet contains a source IP address and a destination IP address.

An IP network is somewhat similar to the telephone network in that you have to have the phone number to reach a destination. The big difference is that IP addresses are often temporary.

Each device in an IP network is either assigned a permanent address (static IP) by the network administrator or is assigned a temporary address (dynamic IP) via DHCP software. Routers, firewalls and proxy servers use static addresses as do most servers and printers that serve multiple users. Client machines may use static or dynamic IP addresses. The IP address assigned to your service by your cable or DSL Internet provider is typically dynamic IP. In routers and operating systems, the default configuration for clients is dynamic IP.

IP addresses are written in "dotted decimal" notation, which is four sets of numbers separated by periods; for example, 204.171.64.2. If you knew the IP address of a Web site, you could enter the dotted decimal number into your browser instead of the domain name (which is why we have DNS!).

Although the next version of the IP protocol offers a virtually unlimited number of unique addresses, the traditional IP address (IPv4) uses a 32-bit number that defines both the network and the host computer. The network class determines how many of the 32 bits are used for the network address, leaving the remaining bits for use as the host number (note the numbers of networks and hosts in the table below). The host number can be further divided between subnetworks and hosts.

Iterative-inductive research: The word iterative means 'involving repetition'. Inductive refers to application of logical validity. Iterative-inductive research is a research that applies scientific methods or processes, which are considered fundamental to scientific investigation and acquisition of new knowledge based upon physical evidence by scientific communities. Scientists use observations and reasoning to propose tentative explanations for natural phenomena, termed hypotheses. Predictions from these hypotheses are tested by various different experiments, and an hypothesis so verified is considered a theory and new predictions are based upon it. Any erroneous predictions, internal inconsistencies or lacunae, or unexplained phenomena initiate the generation of new hypotheses, which are themselves tested, and so on. Any hypothesis which is cogent enough to make predictions can be tested in this way.

Notably, an unverified hypothesis may gain considerable currency among specialists based on its elegance or some intuitive sense of its validity or anticipation of its verification, though it is not formally accepted until convincing experimental proof. An example is the theory of general relativity.

The development of new technologies is enmeshed in the development of knowledge according to the scientific method, and can serve both as a further test of the validity of the underlying ideas and a source for new tools with which to advance the acquisition of knowledge, by broadening the scope of the observable or improving the quality of observations. Moreover, the need to understand or exploit some natural phenomenon in developing a technology can motivate scientific inquiry into the nature of that phenomenon.

A common viewpoint is to take scientific methods as the underlying logic of scientific practices, e.g., Karl Popper. However, the emphasis on underlying logic is disputed by those emphasising sociological aspects. Scientific methods are means used by scientific communities for building supportable, evidence-based understandings of our natural world. There is often controversy in scientific communities about various aspects of these understandings.

Kurtosis: Kurtosis refers to the general form or a quantity indicative of the general form of a statistical frequency curve near the mean of the distribution.

Legends: The word means an unverified story handed down from earlier times, especially one popularly believed to be historical. It means also a body or collection of such stories or a romanticized or popularised myth of modern times. It is also used for one that inspires legends or achieves legendary fame. In the context of the unit in which this word has occurred, it means an explanatory caption accompanying an illustration or an explanatory table or list of the symbols appearing on a map or chart.

Logbook: The word means the official record book of a ship or an aircraft. In the context of the unit in which this word has occurred, it means a record book with periodic entries.

Lupus erythematosus: It refers to any of several connective tissue disorders, especially systemic lupus erythematosus, that primarily affect women of childbearing age, have a variety of clinical forms, and are characterized by red scaly skin lesions.

Metadata: It means the data that describes data. The term "metadata" is widely used to refer to "data about data,"

Modus operandi: The phrase means a method of operating or functioning or it refers to a person's manner of working.

Monograph: The word refers to a scholarly piece of writing of essay or book length on a specific, often limited subject.

Multivariate: It means having or involving more than one variable, for example, multivariate statistical analysis.

Ndembu: Ndembu is the name of a Central African society of Zambia. Victor W. Turner conducted extensive fieldwork among the Ndembu during 1950-1954.

Output: It means the act or process of producing; production and it refers to an amount produced or manufactured during a certain time. For example, intellectual or creative production can be described as literary output; artistic output. In Computer Science the term refers to the information produced by a program or process from a specific input.

As a verb it means to produce or manufacture (something) during a certain time.

Pane: It means a framed section of a window or door that is usually filled with a sheet of glass or other transparent material or the transparent material used to fill such a section.

It refers also to a panel, as of a door or wall or one of the flat surfaces or facets of an object, such as a bolt, having many sides.

Peer: The word refers to a person who has equal standing with another or others, as in rank, class, or age, for example, children who are easily influenced by their peers.

Pie charts: Pie charts are circular graphs having radii dividing the circle into sectors proportional in angle and area to the relative size of the quantities represented. They are also called circle graphs. Such charts are graphical representations of information in which each unit of data is represented as a pie-shaped piece of a circle.

Precision: It refers to the quality or state of being precise or exact.

Prestroika: The term refers to the restructuring of the Soviet economy and bureaucracy that began in the mid 1980s.

Primary data: The primary data is gathered through questionnaire, schedule, observation or interview or by using two or more of these methods.

Questionnaire: This refers to a form containing a set of questions, especially one addressed to a statistically significant number of subjects as a way of gathering information for a survey.

Quixotic: It means being caught up in the romance of noble deeds and the pursuit of unreachable goals; idealistic without regard to practicality.

Rapport: The term refers to the relationship, especially one of mutual trust or emotional affinity.

Repeatability: It refers to the quality of making, doing, or performing again

Robot: It is a mechanical device that sometimes resembles a human and is capable of performing a variety of often complex human tasks on command or by being programmed in advance. This machine or device operates automatically or by remote control. The term refers also to a person who works mechanically without original thought, especially one who responds automatically to the commands of others.

Secondary data: Secondary data can be defined as previously gathered or gathered by someone else. This data should be collected first and often such data will not answer all questions. Such data evaluate the original study and data in terms of their purpose, source, time period and method.

Skewness: It is a statistical term used to describe a situation's asymmetry in relation to a normal distribution. A positive skew describes a distribution favoring the right tail, whereas a negative skew describes a distribution favoring the left tail.

Snowballing: It refers to causing to increase or multiply at a rapidly accelerating rate.

Spreadsheet: It refers to a piece of paper with rows and columns for recording financial data for use in comparative analysis. In Computer Science it refers to an accounting or bookkeeping program that displays data in rows and columns on a screen.

Structuralist model: In his Structuralist Model, Etzioni (1964) argues that Weber and Marx together form the basis for the structural synthetic model. In this view, workers and managers are inevitably in conflict, and all workers are alienated from their labour (they don't own the means of production). Control is central to the concept of organisations. Etzioni sees the rational theorists like Weber contribute to this view by focusing attention on the distribution of power among organizational positions. Natural theorists like Barnard insist that power alienates unless the control structure is acceptable to the subordinates. Etzioni also proposes that his structural model gives equal weight to both formal and informal structures, social and material rewards, and the interaction between the organization and its environment. Still, it acknowledges the inevitable strains between management and workers, personal and corporate needs, rationality and non-rationality, etc. (Scott p. 97). Overall, the structuralist view sees both natural and rational systems as two sides of the same truth. They are in conflict because the elements they describe are in conflict.

Subjectivity: Subjectivity refers to proceeding from or taking place in a person's mind rather than the external world, for example a subjective decision. In Psychology, it refers that exists only within the experiencer's mind. In Medicine, it relates to, or designates a symptom or condition perceived by the patient and not by the examiner. It also expresses or brings into prominence the individuality of the artist or author.

Swap: It means to trade one thing for another or to exchange (one thing) for another.

Symbolic interactionism: Symbolic interactionism is a sociological perspective which examines how individuals and groups interact, focusing on the creation of personal identity through interaction with others. Of particular interest is the relationship between individual action and group pressures. This perspective examines the idea that subjective meanings are socially constructed, and that these subjective meanings interrelate with objective actions. Noted symbolic interactionists are Herbert Blumer and Erving Goffman. George Herbert Mead is seen as a predecessor to symbolic interactionism.

Synchronic: Synchronic relates to the study of phenomena, such as linguistic features, or of events of a particular time, without reference to their historical context.

Tabula rasa: The phrase refers to the state of the mind before it receives the impressions gained from experience or to the unformed, featureless mind in the philosophy of John Locke.

Transcripts: It refers to something transcribed, especially a written, typewritten, or printed copy, for example the transcript of court testimony; an academic transcript. In

Biology it refers a sequence of RNA produced by transcription.

Triangulation: It refers to the measurement of the elements necessary to determine the network of triangles into which any part of the earth's surface is divided in surveying. This method has been used in sociology for finding a position by means of bearings from two fixed points a known distance apart.

T-test: It means student's t-test. A t-test is any statistical hypothesis test in which the test statistic has a Student's t-distribution if the null hypothesis is true.

A statistical test of the null hypothesis is that the means of two normally distributed populations are equal. All such tests are usually referred to as Student's t-tests, though strictly speaking that name should only be used if the variances of the two populations are also assumed to be equal; the form of the test used when this assumption is dropped is sometimes called Welch's t-test. There are different versions of the t-test depending on whether the two samples are independent of each other (e.g., individuals randomly assigned into two groups), or paired, so that each member of one sample has a unique relationship with a particular member of the other sample (e.g., the same people measured before and after an intervention, or IQ test scores of a husband and wife).

If the t value that is calculated is greater than the threshold chosen for statistical significance (alpha conventionally equal to 0.05), then the null hypothesis that the two groups do not differ is rejected in favour of the alternative hypothesis, which typically states that the groups do differ.

Twice-blessed: Blessed means enjoying happiness and twice-blessed is the same in a heightened manner.

Univariate: It means having one variable.



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(Please note that the list of references includes all the sources that the authors of the units have cited in the text. It includes also the books mentioned as Further Reading at the end of each unit of Book 2.)

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