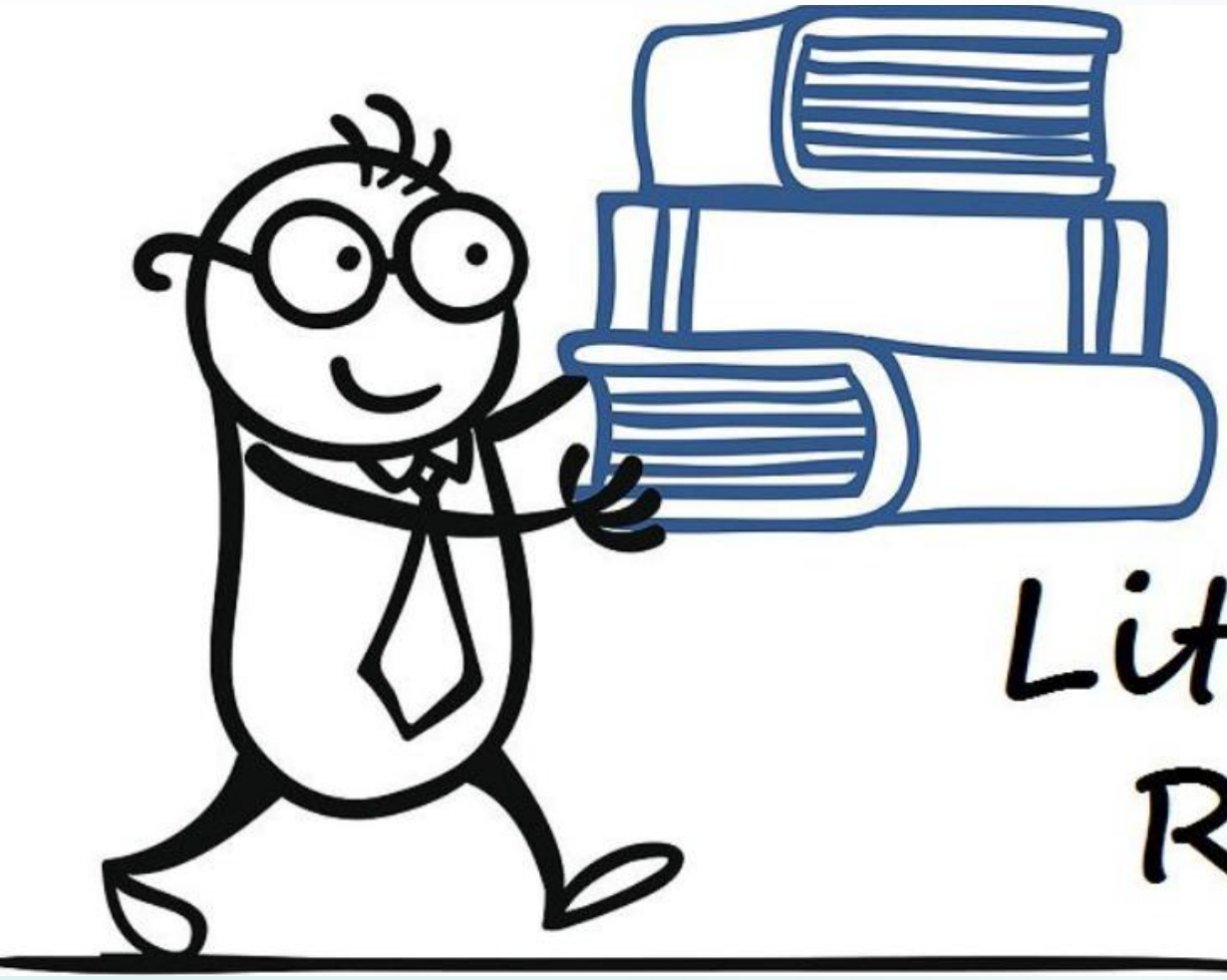
BACS2042 Research Methods

Planning and Designing a Research Study

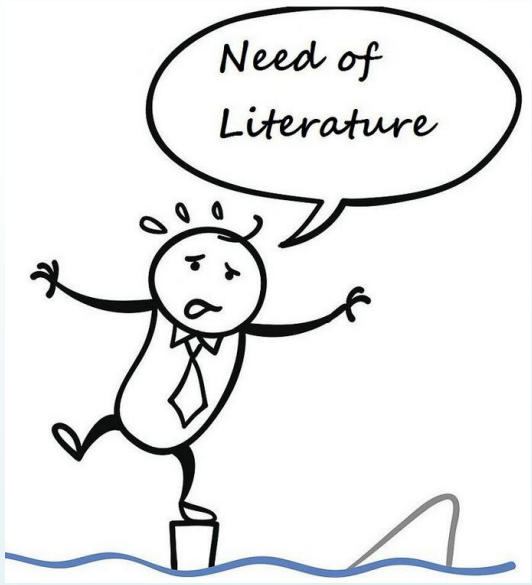
Contents

- Literature Review
- Research Problem Statement
- Research Hypothesis
- Research Design Parameters
- Basic Assumptions
- Tools and Technique of Research Planning



Literature Review

- Review of the published/ unpublished work
- Extensive survey on the existing works



- To gain background knowledge
- Give us knowledge on **WHAT** others have done. **HOW** they have done. Up-to-date info
- Not to replicate what others have done
- Identify the data sources
- How others structured their works/ reports

Literature Review

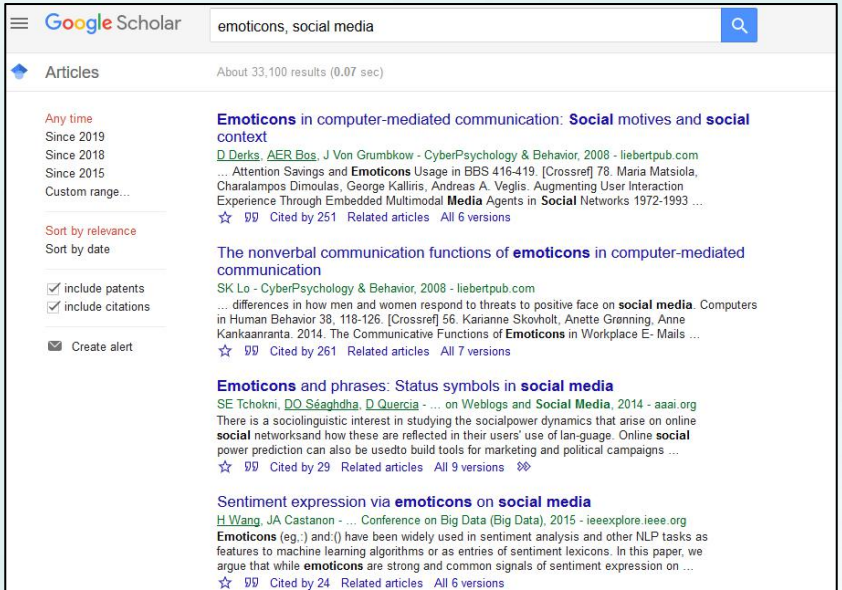
How to conduct the Literature Survey?

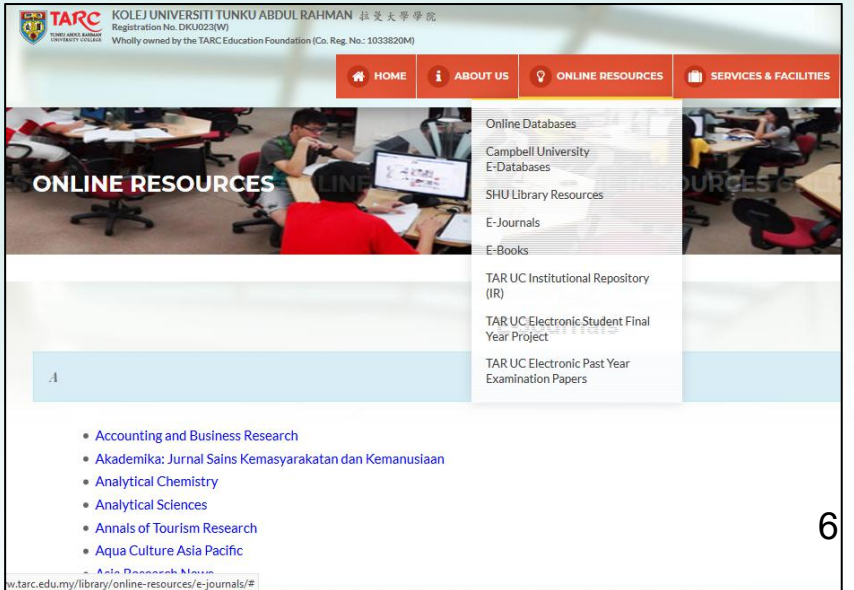
- Identify the relevant sources.
- Extract and Record relevant information.
- Write-up the Literature Review.

Literature Review

Sources of Literature:

- Books and Journals Electronic Databases
- Bibliographic Databases
- Abstract Databases
- Full-Text Databases
- Govt. and Industry Reports
- Internet Research Dissertations / Thesis





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How Do I Feel? Identifying Emotional Expressions on Facebook Reactions Using Clustering Mechanism

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Indian J. pure appl. Math., 32(4) : 581-587, April 2001

FUZZY CONNECTEDNESS

M. N. MU

Department of Pure Mathem
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R. P. CHAK

Department of Mathematics, Hijli C
Kharagpur 72

(*Received 2 July 2000; ac*

The intent of this article is to initiate a unified theory
allied forms, done already in a fuzzy topological space.
ultimately been possible to arrive at certain unified resul
in fuzzy topological spaces, provide results, already kno
revealed that different types of fuzzy connectedness, studi
a single proof.

**Key Words : Fuzzy Operator System; Γ-Separated Fu
Quasi-coincidence; Fuzzy Topological Sp**

1. INTRODUCTION A

It is well known that after the introduction of the
by Chang[4] in 1968, a large number of mathematic
extending different concepts of set topology into fuzzy setting. The concept of connectedness along with some of its allied forms is one of the directions that have hitherto been ventured with meticulous attention. However, the results obtained in connection with different contexts like fuzzy connectedness[10], semi-connectedness[6], δ-connectedness[5] etc. in an fts are seen to be quite parallel and analogous. This is chiefly due to the fact that the study of these variations of the concept of fuzzy connectedness has been effected only by replacing the fuzzy closure operator by fuzzy semiclosure operator or fuzzy δ-closure operator or the like. It can thus be conjectured that the use of a suitable generalized type of operator should unify all these different but similar results. This article is aimed at showing that the conjecture is indeed true.

We shall start with a set and an arbitrary operator on the class of all fuzzy sets on X, satisfying certain conditions; and thereby develop a generalized notion of fuzzy connectedness. Certain

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Can fuzzy entropies be effective measures for evaluating the roughness of a rough set?

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Roughness
Fuzzy entropy
Granular computing

ABSTRACT

The roughness of a rough set arises from the existence of its boundary region. In such a boundary region, each object has a non-zero rough membership degree. When an object's rough membership degree is regarded as its fuzzy membership degree, a rough set can induce a fuzzy set. This relationship motivates us to assert that there may exist some inherent relations between the roughness of a rough set and the fuzziness of the fuzzy set induced from the rough set. This assertion leads us to the question: Can the existing fuzzy entropies be used to evaluate the roughness of a rough set? To answer this question, we first analyze how the boundary region varies when the partition of the universe becomes coarser, and then exploit this analysis in the introduction of a more appropriate definition on the roughness of a rough set. To determine whether a fuzzy entropy can be used to evaluate the roughness of a rough set or not, we develop three methods for estimating the ability of a fuzzy entropy to measure the roughness. The experiments show that these methods are very effective and can be applied to select a fuzzy entropy as a measure of the roughness of a rough set.

1. Introduction

Proposed by Pawlak in [36], rough set theory is based on the assumption that every object of the universe is associated with certain information (data, knowledge). The main goal of rough set theory is to synthesize the approximation of concepts from the acquired data [19,39]. Fuzzy set theory was introduced by Zadeh in [58], which provides an effective tool for representing vague concepts by allowing partial memberships [53]. It addresses the ill-defined boundary of a class through a continuous generalization of set characteristic functions. As a generalization of classical set theory, both rough set theory and fuzzy set theory have been used to model uncertainty [16]. As pointed out in [59], a fuzzy set characterizes the uncertainty that results from a class with unsharp boundaries, whereas a rough set describes the uncertainty generated from coarsely describing a crisp set.

On the connections and differences between rough set theory and fuzzy set theory is a fundamental question [37]. There have been many studies on this topic. Most researchers generally accept that the two theories are related but distinct [1,6,16,30,37]. Therefore, it is very significant to integrate the two theories in terms of the construction of models and measures of uncertainty. To date, many relevant papers have been published in the literature. First, we review several represen-

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l Fuzzy-Connectedness-Based ion in Extraction of Multiple esions

Ewa Pietka

of Technology, Department of Biomedical Engineering, Gliwice,

current study, a fuzzy-connectedness-based approach to fine segelination lesions in Multiple Sclerosis is introduced as an enhanceg 'fast' segmentation method. First a fuzzy connectedness relation a short overview of the 'fast' segmentation method is presented. Fimated segmentation approach is described. The combined method ntation of clinical Magnetic Resonance FLAIR Images.

ion

(MS) is an inflammatory demyelinating disease of the central t is characterised by multiple plaques of demyelination in the he brain and spinal cord.
segmentation of Multiple Sclerosis (MS) demyelination plaques nance (MR) images is a subject of many studies. Algorithms on of the normal and abnormal white matter [1], as well as esions in MS [2, 3, 4] employ supervised and automated, both zzy approaches.
space fuzzy c-means clustering method is used for the segmenof the Fluid Light Attenuation Inversion Recovery (FLAIR) approach employs features extracted from the entire MR vols the processing time, yet the method tends to undersegment sence of local inhomogeneities. In the current study, an en- 'fast' method is presented, based on the fuzzy connectedness

nnectedness

dness (FC) is a fuzzy 2-ary relation in the image spel set. efinition [6] bases on the 2-ary affinity, adjacency, and κ-net fined within a fuzzy digital scene on $\mathbf{Z}^n$ space. In this paper a simplified, graph-based view for $\mathbf{Z}^2$ is used. Let $\mathbf{z_i} = (z_{i1}, z_{i2})$ denote an image

E. Pietka and J. Kawa (Eds.): Information Tech. in Biomedicine, ASC 47, pp. 149–156, 2008.
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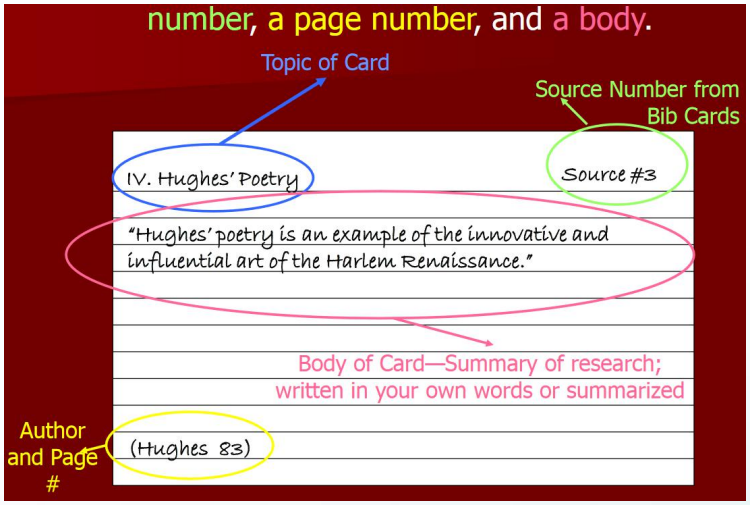
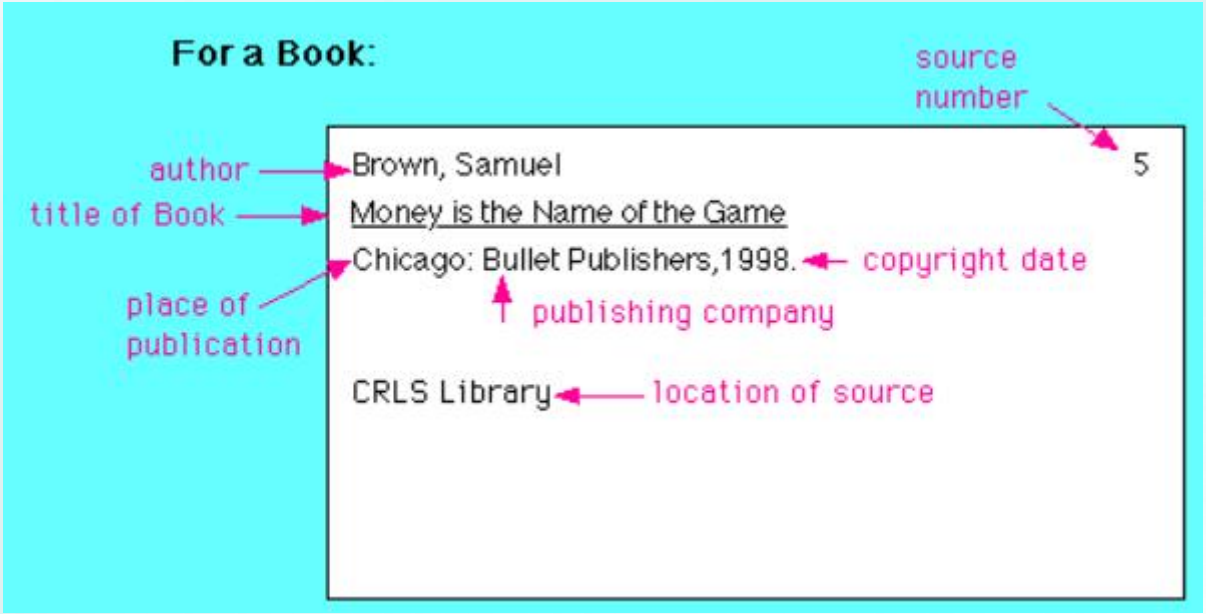
communication through professional marketing techniques (Kozinets et al. 2010). This is not to be seen as a replacement for the traditional marketing techniques but rather as an additional marketing channel that could be integrated with the traditional ones as a part of the

Literature Review

Recording the Literature:

- The most suitable method of recording notes is the card system. The recording system involves use of two sets of cards:
  - *Source cards (3”x 5”) – used for noting bibliographic information.*
  - *Note cards (5”x 8”) – used for actual note taking.*
- Purposes: Provide documentary information for foot notes. It is used for compiling bibliography to be given at the end of the report.





http://www.crlsresearchguide.org/04_Making_Source_Cards.asp
https://1.cdn.edl.io/PX6MmqBb8e5vXRI6ost12s1pwCBecdKLqrUzAOxJkWDq4UGE.pdf

1	computer-aided diagnosis of human brain tumor through MRI	2014	single spectral		
2	Automatic brain tumor detection and neovasculature assessment	2015	FLAIR and T1 and CE-T1	F LAIR to get Peritumoural and WM. Then	
				Halved the T1 image and mirror it and compare	
			Basically it only detect the enhanced-region.	with the tumor region, to confirm its	
			Enhanced region > threshold (rRCBV) is tumor,	existence.	
			else not tumor.	Similar to " 3D multimodal"	
3	Fully automated tumor segmentation based on improved fuzzy connectedness	2011	single spectral		
4	Prioritization of brain MRI volumes using medical image perception	2013	single spectral		
5	Improved fuzzy c-means based PSO initialization and outlier rejectic	2015	single spectral brain tissue segmentation		
6	3D brain tumor segmentation in multimodal MR images based on	2013	multispectral	2 classifiers. One from samples features. One from seed points.	
			1. difference between T1, T2, T1C and FLAIR	Combine the two (weighted add) and get the likelihood map.	
			(T1 - T2), (T1-T1C), (T1-FLAIR),(T2-T1),	Graph cut performed on the likelihood map.	
			(T2-T1C), (T2-FLAIR) - 6 kinds of subfeatures.		
7	3D variational brain tumor segmentation using Dirichlet priors on a	2012	multispectral	Kmeans clusters the multi feature maps (vectorized clustering)	P1=capture the distribution of values
	(Popuri et al)		1. difference of T1 and T1C	But tumor and surrounding tissue is not clearly	(prior knowledge, not classification tr
	(Lit. Review table from this paper)		2.symmetry feature of T2	seperated. Thus, use prior knowledge that better	segmentation is done in the learned
			(T2 left hemi minus right hemi)	disambiguates the two regions. (supervised the	
				prior knowledge) - supress the prob. Of one pixel	
				belongs to the the tumor in the clustered image. Fig. 3.	
8	3D multimodal MRI brain	2015	T1C for high grade tumor	Halve the image, tumor and non-tumor region	
			T2 for low grade tumor	KDE the non-tumor region and run distrubution matching with	
			FLAIR for edema	the tumor region. Extract the tumor region there.	
			Single spectral for tumor		
9	A low cost approach for brain tumor segmentation	2015	T1 and T2 (FCM to get WM, GM, and CSF)		Global and local
	(generative)		healty regions. (vectorized FCM)		seeds sensitivity experiments
	(compare results with Brats Proc.)		Then extract abnormality (include edema) from T1 and FLAIR		
			by comparing with the T1 and T2 clustered		
			image. Cluster on T1C		
			to extract only the active tumor (ET) from edema.	(vectorized RW) random walks on T1C, T1, and Flair	
10	Brain tumors detection and segmentation in MR images: Gabor	2015	Single spectral		
11	An unsupervised learning method with a clustering approach for tum	2016	Single spectral		
	Brats 2013			Enhanced version of Grouping Artificial Immune Network	

Literature Review

How to write the Review?

- If you are referring the major influencing factors in the Sheth's model of Industrial Buying Behaviour, it can be written as:
  - *Sheth (1973) has suggested that, there are a number of influencing factors ……..*
  - *According to Sheth (1973) model of industrial buying behaviour, there are a number of influencing factors……..*
  - *In some models of industrial buying behaviour, there are a number of influencing factors (Sheth, 1973).*

Bibliography:

Sheth J.N (1973), A Model of Industrial Buying Behaviour, Journal of Marketing, 37(4), 50-56.

Literature Review

Expressing and recognizing emotions is, however, an important skill for social performance [6], and therefore the recognition of emotions in face-to-face interaction is widely studied [7]–[11]. However, few studies have shown how much this experience of expressing emotions can actually be transposed into the interactions that occur in social networks [12] such as Facebook or Twitter, which are now the most widely used media. There are about 2.07 billion active users of Facebook [13], who spend most of the day online, making the virtual environment a rich source of data about what users think and feel [14]. In this type of interaction users often adopt the use of emoticons in posts, messages and comments to increase the meaning of these messages and express emotions with symbols without the need to write. Emoticons are small images or combinations of diacritical symbols, intentionally developed to replace non-verbal components of communication, suggestive o expressions [12], [14].

List of References:

[7] K. R. Scherer, "What are emotions? And how can they be measured?" *Social Sci. Inf.*, vol. 44, no. 4, pp. 695–729, 2005. doi: 10.1177/0539018405058216.

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Literature Review

- Remember:
  - *Read relevant literature.*
  - *Refer original works.*
  - *Read with comprehension.*
  - *Read in time.*
  - *Index the literature.*

Research Problem Statement

- Problem definition or Problem statement is a clear, precise and concise statement of the question or issue that is to be investigated with the goal of finding an answer or solution.

Research Problem Statement

- Problem definition or Problem statement is a clear, precise and succinct statement of the question or issue that is to be investigated with the goal of finding an answer or solution.
- There are two ways of stating a problem:
  - *Posting question / questions*
  - *Making declarative statement / statements*

Research Problem Statement

Processes:

- Statement of the problem in a general way
- Understanding the nature of the problem
- Surveying the available literature
- Developing the ideas through discussions
- Rephrasing the research problem

Expressing and recognizing emotions is an important skill for social performance [1-5] (general problem Statement). Problem intended to solve

Few studies, however, have shown how much this experience of expressing emotions can be transposed into the social networks [6]. (research gap)

Research Problem Statement

Criteria of good research problem:

- Clear and Unambiguous
- Empirical Verifiable
- Interesting Novel
- Original Availability of Guidance

Research Objectives

- Research Objectives are the specific components of the research problem, that you'll be working to answer or complete, in order to answer the overall research problem.
- The objectives refers to the questions to be answered through the study. They indicate what we are trying to get from the study or the expected results / outcome of the study.

Research Objectives

Establishment of Research Objectives:

- Generally, they are written as statements, using the word "to".
- E.g., 'to discover …', 'to determine …', 'to establish …', etc.

Research Objectives

Establishment of Research Objectives:

- Research Objectives should be clear and achievable, as they directly assist in answering the research problem.
- The objectives may be specified in the form of either statements or questions.
- Generally, they are written as statements, using the word “to”.
- E.g., ‘to discover …’, ‘to determine …’, ‘to establish …’, etc.

Research Objectives

What are the key features to prepare a good presentation power point?

1. To identify the important practices in applying color.
2. To identify the important practices in applying images.
3. To identify the important practices in applying video.
4. To identify the important practices in power point slide structure.

Soc. Netw. Anal. Min.
DOI 10.1007/s13278-013-0098-8

ORIGINAL ARTICLE

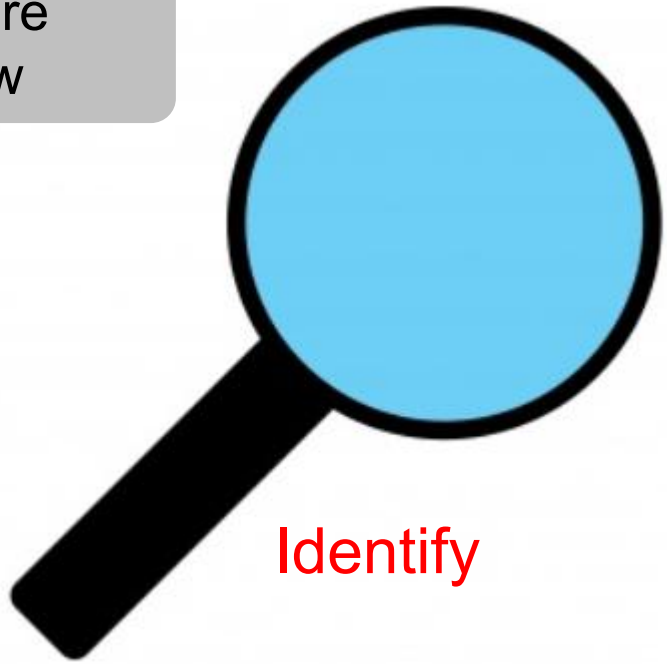
Online engagement factors on Facebook brand pages

Irena Pletikosa Cvijikj · Florian Michahelles

Online engagement factors on Facebook brand pages

Irena Pletikosa Cvijikj · Florian Michahelles

Literature Review



Identify

Research Problem

Research Objective

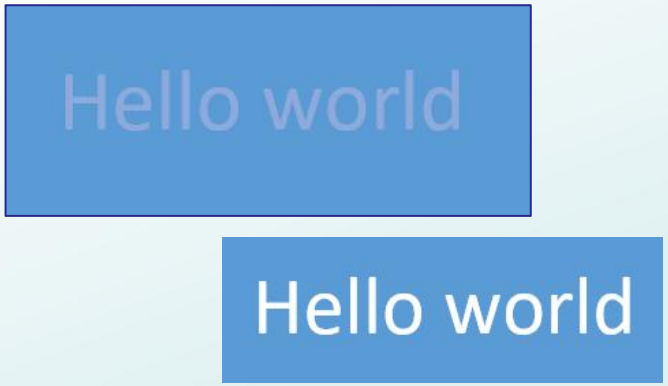
Research Hypothesis

- The research hypothesis is a predictive statement that relates an independent variable to a dependent variable.
- Usually a research hypothesis must contain, at least, one independent and one dependent variable.
- Normally constructed in quantitative research.
- Hypothesis is an assumption, that can be tested and can be proved to be right or wrong.

Research Hypothesis

Objective:

1. To identify if color combination (between font and background) affects legibility.



Independent var.
Dependent var.

Research Hypothesis:

1. Color combinations with higher level of contrast will have better legibility

Process of Hypothesis Testing

Hypothesis Formulation → Data Collection → Data Analysis

Conclusion about the hypothesis (True/ False)

Hypothesis

Kumar R. (2005). Research methodology. SAGE Publications

Research Design Parameters

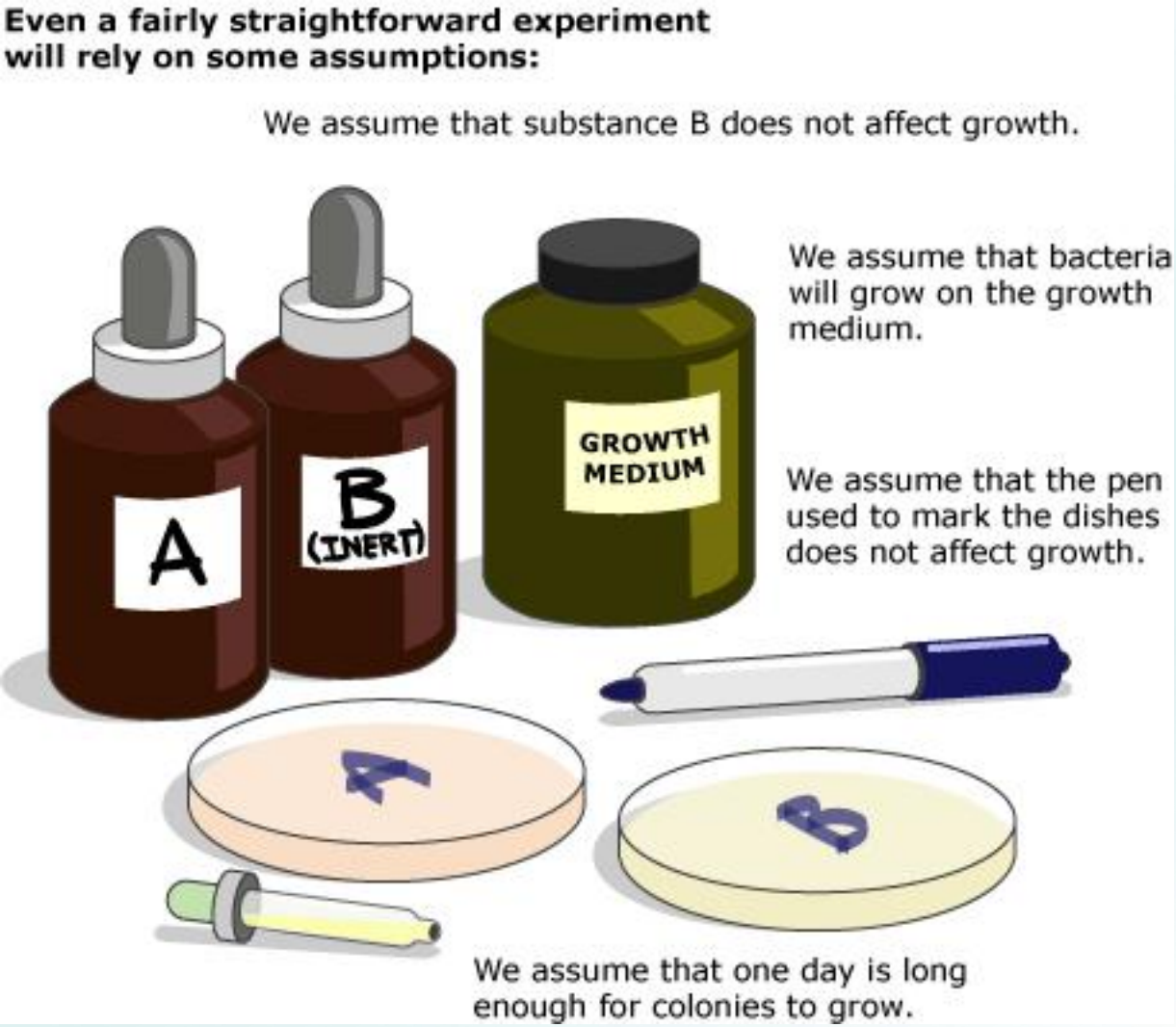
- Type of respondent
  - *e.g., students*
- Length of the survey
  - *e.g., 10 minutes – 2 hours*
- Number of questions
  - *e.g., 5 - 10*
- Data collection method
  - *e.g., online, telephone, in-person, focus group*

Research Design Parameters

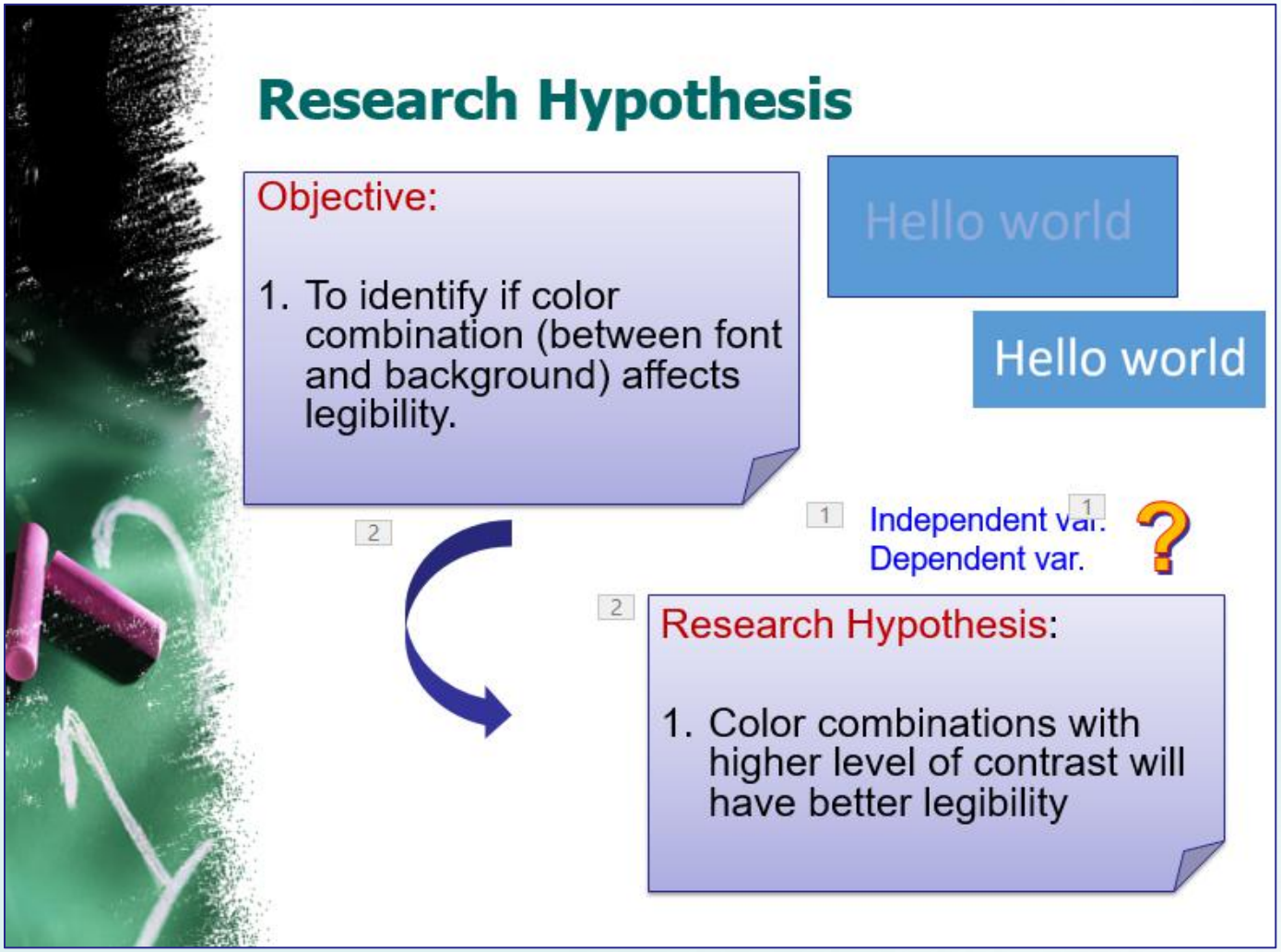
- Geographic scope
  - *e.g., N. America, Europe, World Wide*
- Total sample size
  - *e.g., less than 100 or several thousand*
- Analysis requirements
  - *e.g., descriptive, predictive, market weighted, multivariate*
- Type and scope of the deliverables
  - *e.g., executive summary, presentation, report, webcast, white paper, cross tabulations or banners*

Basic Assumptions

Unexamined Belief



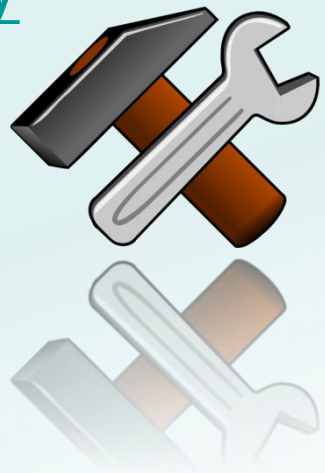
Basic Assumptions



What are the possible assumptions we can make?

Tools and Technique of Research Planning

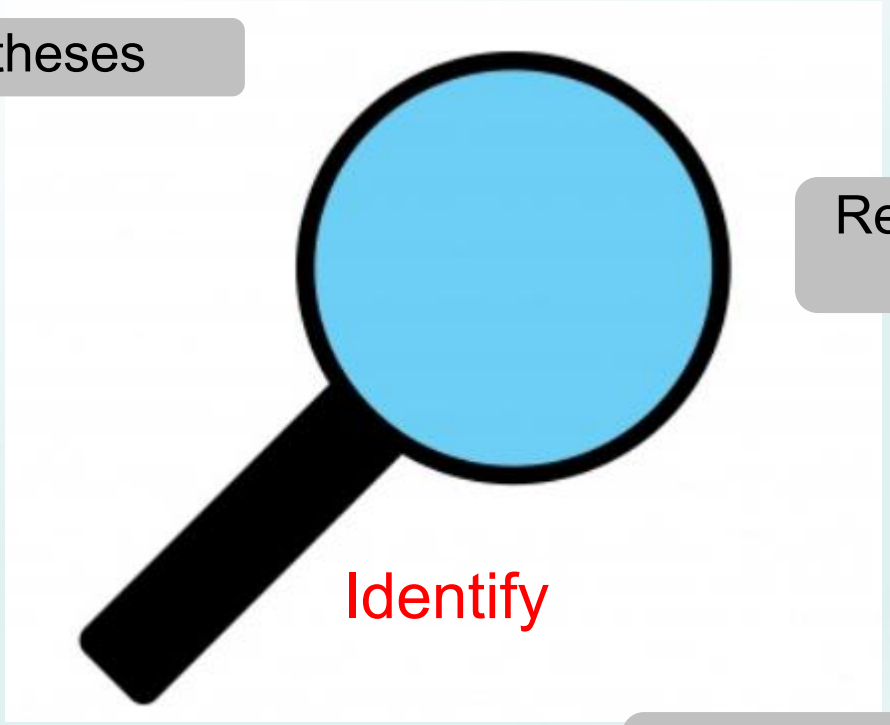
- Reference Management System: BibTex
- Calendar
- Planning sheet: e.g. Company Proprietary Planning Tool
- Note-taking methods: pre-designed web, graphic organizer, note cards



Online engagement factors on Facebook brand pages

Irena Pletikosa Cvijikj · Florian Michahelles

Hypotheses



Research design parameters

Basic assumptions

What have you learned in Chapter 2?

- Literature Review
- Research Problem Statement
- Research Hypothesis
- Research Design Parameters
- Basic Assumptions
- Tools and Technique of Research Planning
- http://www.phrasebank.manchester.ac.uk/