



The Purpose of Research: Clarifying Aims, Goals, Objectives, and Targets

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Abstract

Introduction: Research is a purpose-directed activity. Although aims, goals, objectives, and targets are interrelated statements of purpose, they differ in hierarchy, scope, measurability, timeframe, and significance. This brief review clarifies these terms and describes the characteristics of a good research objective.

Methods: Relevant papers were analyzed to delineate the definitions, interrelations, and distinctions among aims, goals, objectives, and targets in research projects.

Results: The apparent purpose of a study (objectives and goals) addresses specific research questions, whereas its deeper purpose (aim) represents the underlying reason for conducting the study. Aims express ideals and long-term direction; goals outline the primary intent and problem to be addressed; objectives link intention to action by specifying how the research question will be answered; and targets indicate desired values of outcome indicators. A strong objective should be SMART (specific, measurable, achievable, relevant, and time-bound).

Conclusion: Clear articulation of research purpose facilitates translation of findings into practice and enhances the overall quality of research.

Keywords: Aim, Goal, Objective, Target, Purpose

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Introduction

Science is a purpose-directed activity,¹ and purpose is the end toward which effort is directed.² Aristotle described four causes of an artifact—for example, a table: (1) efficient cause (who makes it, e.g., the carpenter), (2) material cause (what it is made from, e.g., wood), (3) formal cause (what defines it as a table, e.g., a raised flat surface supported by legs), and (4) final cause (its intended use, e.g., placing objects on).^{3,4} In research, the final cause represents the study's purpose, the reason the study is undertaken and the end it seeks to achieve it.^{3,5}

The research process begins with identifying a problem and its underlying need,^{5,8} followed by formulation of a research question,^{9,10} which must be aligned with the study's purpose.^{5,8} Research purpose mediates the relationship between the problem and research question: how a question is framed depends on the underlying purpose.⁶ A clear purpose expresses the study's intention, highlights its importance, and provides the rationale for conducting it.^{5,8}

“Research purpose” is an umbrella term that includes research aims, goals, objectives, and targets, which are often used interchangeably and inconsistently in the literature.^{5,11-14} The apparent purpose (i.e., objectives and goals) of the study specifies how research questions will be answered, whereas the deeper purpose (i.e., aim) captures the fundamental reason for carrying out the study that drives the study question itself.⁸ Clarity about the study's purpose promotes effective translation of research findings into practice,¹⁵ whereas lack of clarity, common in many health care projects,¹⁶ can lead to serious consequences, such as confusion between exploratory and confirmatory research, where preliminary findings are misinterpreted as definitive evidence, resulting in poor science.¹⁷ This review defines the research aims, goals, and objectives, and outlines the characteristics of a good research objective.

Research Aims, Goals, Objectives, and Targets

Aims, goals, objectives, and targets are interrelated concepts for statements of purpose^{2,18} yet they differ in



hierarchy, scope, measurability, timeframe, object, and significance (Table 1). Generality decreases from aims, which occupy the highest level and have the broadest scope, to targets, which occupy the lowest level and have the narrowest scope.^{2,18,19} Moving from aims to objectives, therefore represents a shift from abstract ideas to concrete and measurable actions.¹⁹ Aims articulate the broad, long-term direction of a study, are not directly measurable, and usually lack a specific timeframe.¹⁴ Goals translate aims into primary intents, are indirectly measurable through the achievement of objectives, and typically have an intermediate timeframe.¹⁸ Targets represent the desired quantitative value of an indicator to be reached at a defined date or time point and form the most concrete level of purpose.^{12,14} Evaluation follows the same hierarchy: aims provide the basis for judging goals, goals provide the basis for judging objectives, and objectives provide the basis for judging targets, and objectives themselves can be viewed as a progressive list of targets.^{2,12,18} Aims describe where the research will go, goals indicate what the research tries to do, objectives itemize what the research will examine, and targets represent the desired value of an indicator.¹⁹ Table 2 provide two examples of expressing purpose in the form of aim, goal, and objective in mathematics²⁰ and medicine.

Aims

Aims occupy the highest level in a hierarchy of purposeful action and represent the overall intent of the research.²⁰ They are broadly stated purposes expressed with the highest level of generality¹⁸ and are not very specific or action-oriented.⁶ Because aims are conceptual rather than operational, they cannot be directly pursued or measured;¹⁸ instead, they are unattainable but approachable within limits.²¹ Aims typically have no fixed timeframe,¹⁴ serve to remind us of ideals and values,¹⁸ embody underlying principles,¹⁴ and stimulate people to action.²² They provide the foundation for the evaluation of goals and objectives,¹⁸ reflecting the direction in which the research ultimately seeks to proceed.¹⁹

The fundamental aim of science is understanding, to describe and explain the world,²³ and the ultimate aim of research is to produce valid knowledge.²⁴ Scientific aims can be grouped into two broad categories: (1) factual aims: to extend human knowledge by removing errors, filling gaps, and understanding both the form (interpretation of the world) and the contents (specific phenomena) of the universe, that is, to understand the physical, biological, or social world beyond what is already known. (2) Technological aims: to extend human control over the universe in order to improve the world.^{8,25,26} In clinical research, the overarching aim is to enhance patient care,²⁷ by delivering safe, beneficial, and cost-effective healthcare services.²⁸

Goals

Aims are translated into goals, which express the primary intent of a study to address a defined problem.^{18,29} Goals are more concrete than aims but remain broader than objectives; they are indirectly measured through the achievement of objectives.¹⁴ Setting and achieving goals is a basic expectation of every human activity.²² Goals are set to reflect the desired changes or outcomes that are expected from research²² and are established through a systematic analysis of the problem. One structured approach is the RAID process, which involves Reverviewing the problem, Agreeing on solutions and goals, Implementing the solutions, and Demonstrating changes by measuring objectives.²² Goals, sometimes referred to higher-order objectives,¹⁴ serve as the basis for evaluating objectives¹⁸ and indicate what the research tries to accomplish.¹⁹

Research goals can be classified into three categories (Figure 1): exploratory, descriptive, and confirmatory (explanatory, predictive, and evaluative). Exploratory research refines or clarifies an unfamiliar problem about which little is known;^{11,30-32} descriptive research characterizes the problem;³³ and confirmatory (hypothesis-driven) research tests a prespecified hypothesis to solve the problem. The goal of exploratory and descriptive research is to generate hypotheses but the

Table 1. Comparisons of research aims, goals, objectives, and targets according to different themes^{2,14,18,19}

Purpose	Hierarchy	Scope	Timeframe	Measurability	Object	Significance
Aim	High order	Broad	Long-term	Not measurable	Goal	Represents ideals and values, and describe where the research will go
Goal	Intermediate	Intermediate	Intermediate	Indirectly measurable	Objective	Provides a basis for assessment and point to what the research tries do
Objective	Low	Narrow	Short-term	Directly measurable	Exact target	Itemizes what the research will look at
Target	Very low	Very narrow	A specific date in the future	Directly measurable	Numeric value of an indicator	Represents the desired value of an outcome indicator

Table 2. Examples of expressing purpose in the form of aim, goal, and objective in mathematics and medicine

	Mathematics	Medicine
Aim	To enhance students' mathematical understanding	To improve patient care in diabetes mellitus
Goal	To grasp the concept of fractions by students	To improve glycemic control in patients with diabetes mellitus
Objective	Students will be able to successfully add fractions with different denominators, achieving at least 80% accuracy on a paper-and-pencil test that includes denominators up to 12	To compare blood glucose levels measured by a glucometer with those obtained by the standard method in patients with type 2 diabetes mellitus

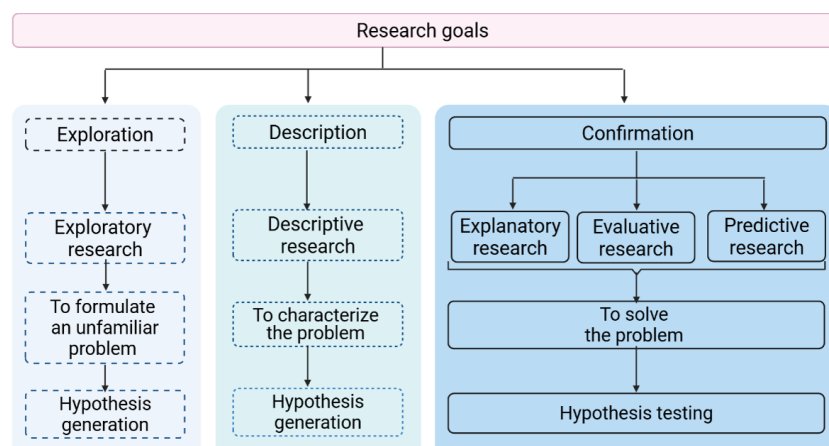


Figure 1. Research goals and their characteristics. Created in <https://BioRender.com>

goal of the confirmatory research is to test a prespecified hypothesis.^{11,15,30–32,34–37} In the health sciences, goals can be further divided into cognitive goals (i.e., identifying disease mechanisms) and action-oriented goals (i.e., diagnosis, prevention, and treatment).^{28,38}

Objectives

Goals are translated to objectives,¹⁴ which are “predetermined results towards which effort is directed”.⁵ Objectives are more specific than goals, and often a goal summarizes the intent of several related objectives.^{5,20,39} each contributing to the same overall purpose.¹² In this sense, sometimes, an objective can be viewed as a sub-goal.¹⁶ Objectives are not merely a list of experiments; instead, they are a thoughtful, progressive list of targets,¹² that state the specified level of a measurable indicator.¹⁶ They connect intention with reality, detailing how the research question is answered or how the hypothesis will be tested, specifying what will be done to achieve the purpose,^{12,39,40} and identifying the factors or relationships to be examined.¹⁹

SMART Criteria for Objectives

The SMART framework for writing objectives was introduced by George T. Doran in 1981¹³ to provide a clear direction for actionable planning.¹⁶ According to this framework, a research objective should be specific, measurable, achievable, relevant, and time-related.^{5,6,13,39,41} To be *specific*, research objectives should not be vague⁶ and should clearly state the area of improvement,²² focusing on an outcome.¹⁶ Outcomes are measurable endpoints of the objectives that are measured in the study.^{9,14,16} *Measurable* means that the outcome can be evaluated;⁶ an objective must include a quantitative indicator of the outcome.^{16,22} *Achievable* implies that the objective can reasonably be met at the desired target level of the indicator with the available resources in a particular time.^{16,42} The *Relevancy* of research objectives means that they address the research problem.⁶ *Time-related* tasks require a defined timeframe or deadline for completion.^{6,16,22,42}

Objectives are typically written as a single infinitive sentence beginning with “To,” using action verbs

(specific verbs) rather than generic verbs. Specific verbs (e.g., determine, describe, identify, compare, measure, list, demonstrate, classify, and explain) can be directly evaluated and leave little room for interpretation. In contrast, generic verbs (e.g., know, appreciate, understand, learn) are open to ambiguity.^{2,9,16,41} Well-constructed objectives specify the key components of outcome, indicator, target, and time.^{16,43}

Conclusion

Research is not an end in itself and must have a purpose, which, is expressed in descending generality, as aims, goals, objectives, and targets. This hierarchy can be visualized as a ladder (Figure 2), in which targets—the desired values of

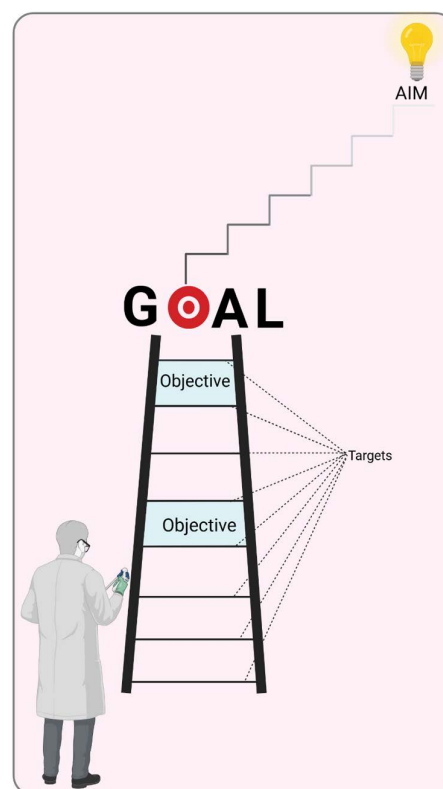


Figure 2. Ladder approach of purpose hierarchy. In this model, targets are rungs of the ladder. A progressive list of targets is an objective, and a set of objectives provides us with our goals. Aims remind us our immeasurable but approachable ideals. Created in <https://BioRender.com>

indicators—form the rungs. A thoughtful and progressive list of targets fulfills an objective; a set of objectives defines the goals, which represent the primary intents of the study that address the problem. At the highest level, aims embody our broad ideals and values. Although aims are not directly measurable, they inspire action and provide the ultimate direction for research.

Artificial Intelligence Use

ChatGPT (OpenAI) was used to improve language fluency and clarity. The tool was not used to generate content or draw conclusions. The authors are solely responsible for the integrity and accuracy of the manuscript.

Authors' Contribution

Conceptualization: Asghar Ghasemi.

Software: Parsa Ghasemi.

Supervision: Khosrow Kashfi, Asghar Ghasemi.

Validation: Asghar Ghasemi, Khosrow Kashfi.

Visualization: Parsa Ghasemi, Asghar Ghasemi, Khosrow Kashfi.

Writing—Original Draft: Parsa Ghasemi.

Competing Interests

The authors declare that they do not have any conflict of interest.

Ethical Approval

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