

The Population Perspective: Review, Critique, and Relevance¹

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While many theorists using frameworks within the population perspective accept some fundamental assumptions, they debate two issues. Debates about appropriate units of analysis and definitions of terms and debates about selected processes continue. This paper reviews accepted assumptions and continued debates and offers alternative resolutions to these debates. The paper concludes by realistically identifying how the population perspective may enhance understanding of organizations.

INTRODUCTION

The population perspective, known as population ecology (Hannan & Freeman, 1977, 1984), organization ecology (Brittain & Freeman, 1980; Carroll & Delacroix, 1982; Carroll, 1984), natural selection (Aldrich, 1979; Weick, 1979), or the population perspective (McKelvey, 1982), has received increased attention in organization literature. Elsewhere, arguments can be found supporting and testing (Langton, 1984; Freeman & Hannan, 1983), critiquing (Bourgeois, 1984; Astley, 1985), and comparing and contrasting (Aldrich & Pfeffer, 1976; Aldrich, McKelvey, & Ulrich, 1984; Ulrich & Barney, 1984) the population perspective. This review summarizes core assumptions, identifies two major unresolved issues, offers suggestions for their resolution, and clarifies what the population perspective may add to an understanding of complex organizations.

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CORE ASSUMPTIONS OF THE POPULATION PERSPECTIVE

Three assumptions form the core of the population perspective and distinguish it from other ways to study organizations.

Assumption 1. The unit of analysis in the population perspective is the organization or a population of similar organizations, not individuals.

The population perspective highlights *organizational* changes which lead to survival or mortality. Theory and research focuses on why organizations, not individuals, change and survive. The mortality of restaurants (Freeman & Hannan, 1983) and newspapers (Carroll & Delacroix, 1982; Delacroix & Carroll, 1983) and the evolution of the British pottery industry (Brittain & Freeman, 1980), and organizational forms in ancient Mesopotamia (McKelvey, 1982) all focus on organizations and populations of organizations as the units of analysis. Individual decision-making styles and strategies, while influencing organizational change and survival, are excluded from the population perspective models.

Assumption 2. Theory and research within the population perspective assumes that explanations of why and how organizations change and survive should focus on environmental selection processes.

Organizational change occurs, all organization theorists accept this premise. Theory and research in the population perspective explains organizational change, or evolution, as a function of environmental selection. While recognizing that individuals in organizations make many choices over strategy, form, and goals, population perspective theorists rely on what Schwab (1960) called the rationalistic principle of inquiry: the behavior of an object can best be explained by factors external to the object. Environmental selection occurs as conditions external to an organization determine how the organization changes over time. Firms in the British pottery industry in the 1700's evolved toward bureaucracy as a response to environmental conditions of better living standards, growth of tea and coffee drinking, and the development of the nation's transportation and communication systems (Langton, 1984, p. 340). In the environment facing the pottery industry in the 1770's, the bureaucratic organizational forms gave Wedgwood a competitive edge by more efficiently allocating resources and producing goods or services desired by the environment. As a result, other pottery firms adopted this organizational form. Changes to firms in this industry resulted from environmental conditions favoring bureaucratic organizational forms.

Assumption 3. Theory and research from the population perspective assumes that organizational changes can only be investigated with longitudinal analyses of organizational evolution, emphasizing organizational birth and mortality.

Research using population perspective emphasizes how organizations change over time. To track organizational change, sufficient time must pass

to ensure that the organizational change is permanent and that the environmental conditions leading to those changes be specified. Organizational changes most often studied by population theorists include birth and mortality rates. Organizational birth or death provides a somewhat clear-cut statement of organizational change. Most population studies of newspapers, labor unions, and restaurants highlight environmental conditions which led to organizational birth or mortality.

UNRESOLVED ISSUES IN THE POPULATION PERSPECTIVE

While most population perspective theorists would accept the above assumptions, they would debate two unresolved issues: (1) clear definitions of the units of analysis, and (2) specification of selection processes. Lacking common acceptance of these two fundamental issues makes the population perspective landscape appear overgrown with research which addresses similar problems with different terms and concepts.

Definitions of Units of Analysis

The population perspective has become littered with a variety of concepts and terms related to levels of analyses. Levels of analyses can be placed into two general categories: definitions of individual organizations and organizational forms, and definitions of organizational environments. Population perspective theorists need to both clarify and operationalize key concepts and terms.

Individual Organizations and Organizational Forms. A lack of clarity exists in distinguishing individual organizations, organizational forms, and populations. Carroll's (1981) early research on education systems relied on three global types of organizational forms: primary (elementary), secondary (high school), and tertiary (university). He then suggests that all educational organizations within a form compose a population of organizations. In subsequent work on newspapers (Carroll & Delacroix, 1982), the concept of organizational forms is abandoned and mortality of individual organizations is studied.

Hannan and Freeman (1977, 1984) begin their discussion of *population* ecology by discussing the importance of populations. They argue that "adaptation of organizational structures to environments occurs principally at the *population* level, with forms of organization replacing each other as conditions change" (1984, p. 149). However, as they develop their theory, the focus turns to inertial forces of individual organizations. An organization's form is defined by how the individual organization mobilizes resources

around (1) goals, (2) forms of authority, (3) technology, and (4) marketing. These four properties can be used, according to Hannan and Freeman (1984), to classify organizations into forms.

In their research, Freeman and Hannan (1983) acknowledge that populations of restaurants exist, e.g., fast food, ethnic, chain, and coffee shops. However, the unit of analysis in their research examines how the degree of specialism within an individual restaurant relates to environmental volatility and grain, not how populations of organizations respond. Likewise, Britain and Freeman (1980) examine the evolution of the electronics industry by focusing on individual organizations and the transfer of information from one organization to the next, with little discussion of organizational forms or populations.

Langton (1984) distinguishes between individual organizations and populations in the British pottery industry. He defines organizations as independent firms, e.g., Wedgwood, and suggests that organizational populations refers to all British pottery firms.

Aldrich (1979, p. 27) defines an organization on three dimensions: goals, boundaries, and activities. He then suggests that the population ecology model can be equally well applied to individual organizations as well as populations, although he never defines populations.

McKelvey (1982, p. 24) attempts to clarify the distinction between populations, organizational forms, and organizations. He defines populations, or species, as "a group of organizations that are similar in the competence needed to produce the product or service that is essential to their continued survival." He then proceeds to define organizational form as "those elements of internal structure, process, and subunit integration which contribute to the unity of the whole of an organization and to the maintenance of its characteristic activities, function, or nature" (p. 107). The distinction between population and organizational form is vague inasmuch as the internal structure, process, and integration may in fact be what leads to an organizations' competence.

The lack of agreement on organizational definitions creates difficulties for those trying to interpret population perspective research, i.e., does the selection process affect an organizational form or a population or an individual organization? These difficulties also make it difficult to aggregate research in different samples to develop population perspective theory, i.e., can the results found when studying individual organizations be coupled with results from studying organizational forms or populations? If selection models can be applied equally to individual organizations and organizational forms and populations, what is the value of adding population level analyses?

To begin to resolve the definitional dilemma of individual organizations, organizational form, and populations, we suggest the following defini-

tions. An *organizational unit* is the smallest possible unit within or constituting an organization where there exists (1) responsibility for marketing a product or service, including control and choice of channels of distribution, (2) responsibility for strategic planning and establishing goals for the organization unit, (3) responsibility for establishing and monitoring clearly defined and reported performance outcomes, e.g., profit and service, (4) responsibility for establishing and monitoring reporting relationships, and (5) responsibility for developing and employing unique technical processes to deliver a product or service.

This definition of organization unit differs from Hannan and Freeman's (1984) and McKelvey's (1982) in that it explicitly acknowledges that what we may traditionally consider an "organization" may in fact be many "organizational units." For example, Westinghouse Corporation could be defined as a legally distinct organization. However, if we used Westinghouse Corporation as the unit of organizational analysis, our information would be so aggregated as to be meaningless. Within Westinghouse in 1984 were 29 separate organizational units (called profit centers). Each unit adhered to the criteria we established. An ecological analysis using Westinghouse in a sample should identify these sub-units, then collect data on each organizational unit. When a legally distinct organization has only one organizational unit, then the organizational unit and organization are synonymous. While this definition seems obvious, it has not been applied in population perspective research, thus leading to confusion.

We define *organizational form* and *population* synonymously. An organizational form or population represents a set of organizational units with common characteristics. Organizational units with similar internal structure, processes, and integration processes would have similar competences needed to produce a product or service. As such, the common forms would compose a population.

Having defined organizational forms, or populations, raises two further questions. First, what relevance do organizational forms have on understanding complex organizations? Second, how can organizational forms, or populations, be derived?

Since most of the research which predicts organizational change focuses on how organizational units respond to environmental conditions, few research results exist on the impact of populations or organizational change. Ulrich (1982) found that after individual organizations were classified into populations, population effects did occur as higher amounts of variance in firm prosperity were explained when studying populations rather than individual organizations. Similarly, Van de Ven and Ferry (1980) found that when studying similar work units (organizational forms), they were able to explain more variance in performance than when studying individual work

units. These two primary research efforts begin to identify the relevance of identifying organizational forms or populations.

The methodology for defining organizational forms or populations has been described in detail in McKelvey (1982). He suggests that evolutionary analyses be used to track the origins of individual organizations from common organizational forms or populations. A complementary procedure to evolutionary analysis for defining populations is numerical taxonomy (Sneath & Sokal, 1973). Using numerical taxonomy, many characteristics can be clustered to identify similar organization units. This approach has been applied to organizational analysis by Hall (1977), Goronzy (1969), and Ulrich (1982).

Environments. Just as the concept of organization and organizational form has caused confusion among population perspective theorists, so has the concept of environment. Environmental conditions, in the population perspective, constrain choices made by organization decision makers and influence how organizations change and survive. Such environmental constraints *select* which organizational units and populations survive over time. Environmental selection occurs as the external constraints cause organizational units and populations to adopt new internal structure or processes to survive.

Many characterizations of environments emphasize global, economic, and political conditions (Duncan, 1972). Carroll and Delacroix (1982) identified political legitimacy, industry, maturity, general economic conditions, and business cycle as environmental factors which influenced mortality of Irish and Argentine newspapers. Freeman and Hannan (1983) measured variance of restaurant sales in a city to assess environmental variability and seasonality of restaurant sales to measure environmental grain.

Others have focused less on general environmental conditions and more on specific, or task, environments (Osborn & Hunt, 1974; Hall, 1977). In the population perspective, similar distinctions can be made between milieu and niches (McKelvey, 1982; Ulrich & Kurke, 1985). Milieu³ represent conditions external to the organizational unit over which people in the unit have little control. The economic and political conditions Carroll and Delacroix (1982) and Freeman and Hannan (1983) examined would be examples of environmental milieu.

Niches would be represented by the set of transactions between an organization unit and actors from whom it directly receives or provides

³McKelvey (1982) divides environments into environments and niches. Following Ulrich and Kurke (1985), we prefer the term "milieu" to represent environmental conditions over which people in the organization have little control.

resources. For example, a restaurant's niche would be characterized by transactions with suppliers, financiers, employment agencies who provide employees, and customers. Expanding on Williamson's (1975, 1981) transaction cost framework, we suggest that transactions between an organization unit and actors in its niche can be characterized by breadth (the number of actors the organization unit interfaces with), depth (the history of the transaction and degree of shared values), and investment specificity (the degree of investment specific to the relationship). For example, a restaurant niche may be characterized by its breadth (does it have many or few customers, suppliers, financiers, etc.), depth (do customers, suppliers, financiers, etc. have long-term relationships with the restaurant), and investment specificity (does the restaurant depend exclusively on limited actors? For example, a restaurant in an office building services exclusively the office building). These niche analyses can focus on the transaction between an organization unit and its external actors.

Niche analyses occur at either a micro-level where the competition for resources occurs between organizational units within a population or at the macro-level where populations compete for resources. For example, in the transportation industry, a number of populations exist. Airlines, trains, buses, and automobiles, represent populations within the airline industry. At the micro-niche analysis, organizational units exist within the airline industry, e.g., airline companies or divisions of conglomerates in the airline business, compete for supplier, financial, and customer resources. Simultaneously, at the macro-niche level, airlines as a population of individual organizational units compete with trains and buses for environmental resources.

In clearly defining organizational environments, three levels of environmental analysis can be examined. First, environmental milieu conditions exist as economic, political, technological, demographic, and industry conditions which constrain population and organizational unit choices and determine which organizations will survive over time. These milieu conditions are generally beyond the control of managers. Organizational units and populations respond to these conditions, For example, the aging population in the United States has lead many organizations to respond in dramatic ways, e.g., universities have established adult education, hospitals have modified services, and new products have entered the marketplace. Second, macro-niches represent sets of transactions between populations and stakeholders who hold key resources for a population's continued survival. Third, micro-niches exist within populations. Organizational units compete to attain resources from stakeholders in their micro-niche. Targets of investigation in the population perspective can be divided into environmental and organizational issues, then further divided into specific types of environments and organizations (see Table I).

Table I. Targets of Investigation in Population Perspective

Environmental level of analysis	Organizational level of analysis
Milieu Environmental conditions over which organization members have little direct control, e.g., economic, political, social, and technological changes.	
Macro-niche Stakeholders in organization environments whose influence is felt across individual organization units, e.g., trade associations, unions, market demands, and legislation.	Organizational form/population Organizational units with similar characteristics around market, technology, internal structures, processes, and integration processes.
Micro-niche Stakeholders in organization unit environments who interface directly with members of the organization unit and over which organization units have some degree of flexibility in governing the relationship, e.g., specific customers, suppliers, financiers, parent corporations, etc.	Organizational unit The smallest possible unit within or comprising an organization where there exists responsibility for marketing, strategic planning, reporting outcome measures, and using technological services.

Specification of Selection Processes

In addition to defining units of analysis, a second challenge within the population perspective is to specify how selection occurs. Selection refers to the process whereby environmental conditions cause organizational unit and population changes. Classical biological studies by Kettlewell (1956) and Cook, Askey, and Bishop (1970) studied the Biston betularia (a moth in Britain) and found that pre-industrial England white moths were most likely to be selected for and survive over time because they blended with light bark on trees; the darker variants were more easily seen and eaten. Due to the greater protection afforded the lighter moths, the species, over time, became whiter. However, with industrialization and pollution, tree bark turned dark. The darker variants were now more able to blend with the protective trees and thus more likely to survive. The species slowly evolved to a darker color. Cook, Askey, and Bishop (1970) have more recently found that with population-abatement procedures, light-colored moth forms are again becoming more plentiful. For organization studies, selection implies that changes in environmental conditions (both milieus and niches) predict how organizational forms and organizational units change and survive.

As Campbell (1969) and Weick (1979) note, two challenges face theorists applying selection theory to organizations. First, amid all the factors which may change an organization and affect its survival, how can measurable selection processes be specified and assessed? Second, for an organization to sur-

vive, it must be selected, to see if it is selected, it must survive. This tautology may keep selection theorists from specifying selection processes.

As a result of these two challenges, selection theory and research has generally focused on single variable models. Freeman and Hannan (1983) examined a univariate model of selection, the fit between degree of generalism in restaurants and environmental variability and seasonality. They found that specialists are favored in high variation, fine-grained (nonseasonal) environments and that generalists are favored in high variation, coarse-grained (seasonal) environments. Carroll and Delacroix (1982) examined newspaper age as a selection criteria. Newer newspapers faced an increased liability of newness in economic and political turbulence. Brittain and Freeman (1980) suggest that a critical organizational dimension which leads to favorable selection is *r* vs. *K* strategy. *R* strategists move quickly to exploit resources as they become available and are favorably selected in more turbulent environments. *K* strategists compete for efficient use of resources and are favorably selected in densely settled, less turbulent environments. Current research examines fit between organizational activities and environmental conditions by characterizing organizations based on only one or two dimensions (Lawrence & Lorsch, 1969; Drazin & Van de Ven, 1985).

To move beyond single variable selection models, we suggest two steps. First, a general theory of selection needs to be explicated. This theory needs to go beyond a discussion of selection as "fit" between an organization and its environment and discuss *why* the fit occurs. Second, the theory of selection must identify selection processes for both organizational units and organizational forms in micro- and macro-niches and milieus. While the selection processes may overlap across these levels of analysis, a framework for understanding selection processes needs to be identified.

Theory of Selection. We suggest that selection of organizational units or organizational forms occurs because an organization's activities are reinforced by niches or milieus. The principle of reinforcement suggests that organizational activities which receive reinforcement from external stakeholders are likely to continue, while those activities which do not receive reinforcement will not (Bandura, 1977). As applied to selection, reinforcement theory suggests that organizations which perform activities which lead to favorable consequences as defined by environmental conditions will continue and survive. We suggest that organizational units or forms survive because they are selected; they are selected because they offer to the milieu and niche activities which meet an existing need, therefore they are reinforced. Using the concept of reinforcement, the population perspective becomes more explicit. The environmental conditions offer a stimulus to which organizational units or populations respond. Reinforcement is determined by the environmental conditions being satisfied by organizational responses. The study

of selection processes then focuses on the specification of how reinforcement occurs.

The particular reinforcers may differ by the primary beneficiary of the organization (Blau & Scott, 1962). For business concerns, reinforcers would follow activities which help firms become more competitive. Organizational activities which increase efficiency, effectiveness, profits, and stability may be reinforced, leading to fit, selection, and survival. Commonwealth organizations which are favorably selected engage in reinforced activities such as performing public service, e.g., education, or meeting public needs, e.g., highways. Activities which allow these organizations to better meet public needs through gaining political support and acquiring public assistance become keys to these organizations being reinforced, selected, and surviving over time. Service organizations such as hospitals, churches, or social groups are reinforced as they provide individuals value for their participation in the organization. These organizations are more likely to be reinforced, selected, and survive as they engage in activities which meet the needs of their client group (health care, personal growth, and social support).

Applying this theory to previous research helps explain why selection occurs. Restaurants (Freeman & Hannan, 1983) or pottery firms (Langton, 1984), being business organizations, are selected if they operate efficiently in their environments. Wedgwood was able to operate more efficiently as a bureaucracy. This more efficient operation leads the firm to be reinforced through higher profits. As Wedgwood received increased reinforcers, other pottery firms recognized the reinforcement and evolved toward bureaucracy. For newspapers in volatile political and economic conditions, age becomes a critical reinforcer (Carroll & Delacroix, 1982). Newer papers are unable to receive reinforcement from the environment in the form of subscriptions. Lacking this reinforcement, the newspapers are more likely not to fit environmental conditions, be selected against, and fail.

Framework for Selection. Having identified levels of analysis and a reinforcement rationale for selection, we suggest a framework for thinking about the selection process facing organizational units and organizational forms within micro- and macro-niches and milieus. As indicated in Table I, within micro-niches, organizational units compete for reinforcers which lead to selection and survival. Within macro-niches, organizational forms or populations and organizational units face selection pressures. Within milieus, organizational forms and organizational units face selection pressures. For example, while dark moths (the analogue to organizational form) were more favorably selected with pollution-covered trees, individual moths (organizational units) had to eat to survive. Likewise, organizational forms must respond to milieu conditions as must organizational units. Individual restaurants must respond to volatility and seasonality as must restaurant forms.

Having identified the levels of environmental and organizational analysis, we can begin to specify selection processes within micro- and macro-niches on organizational units and forms. As indicated in Table II, selection processes differ according to level of analysis of environments and organizations. For organizational units, selection processes must be dealt with at the micro- and macro-niche and milieu levels of environmental analysis.

Within micro-niches, organizational units work to be reinforced. Reinforcement for the organizational unit comes as people in the organizational unit attempt to efficiently manage transactions with key actors. This requires identifying key actors, then assessing how those transactions can be efficiently managed (Williamson, 1981). Within the micro-niche, key stakeholders might include customers, suppliers, investors, competitors, or the parent organization. Transactions with each actor may be managed in a variety of ways. Ouchi (1981) defines market, bureaucracy, and clan governance mechanisms as means of managing transactions. If customer transactions, for example, are managed efficiently, the organizational unit receives reinforcement by increasing its customer base. Individual restaurants, for example, compete within their micro-niche. A local fast food restaurant competes with other

Table II. Selection Processes for Organizational Units and Forms in Micro- and Macro-Niches and Milieus

Environmental level of analysis	Organizational level of analysis	
	Unit	Form/population
Micro-niche	<p>Selection occurs as actors reinforce activities by the organization unit.</p> <p>Reinforcement comes by the unit being efficient, profitable, and offering goods and services of use to the actors.</p>	
Macro-niche	<p>Selection occurs as actors who influence across individual organizational units reinforce activities.</p> <p>Reinforcement comes by the unit delivering valued outcomes to the macro-niche actors.</p>	<p>Selection occurs as actors in the macro-niche reinforce activities of populations within the macro-niche.</p> <p>Reinforcement comes by the population/form delivering valued outcomes to the macro-niche actors.</p>
Milieu	<p>Selection occurs as environmental conditions reinforce particular organizational units.</p> <p>Reinforcement is evidenced by the unit's continuing to respond to the milieu conditions.</p>	<p>Selection occurs as environmental conditions reinforce populations or forms.</p> <p>Reinforcement is evidenced by forms of populations continuing to receive resources from the milieu conditions.</p>

fast food restaurants for customers who will reinforce the restaurant. If the restaurant owner makes accurate choices about its operations, customer reinforcement should follow in the form of increased business. Within the micro-niche, organizational units compete for resources from key stakeholders. Receiving these resources allows for favorable selection and survival.

Within the macro-niche, organizational units also compete for resources. Macro-niches are occupied by stakeholders who provide resources or constraints for populations of organizational units. Selection of organizational units within macro-niches occurs as actors in the macro-niche make decisions which impact organizational units. Organizational units which respond to these macro-niche changes receive reinforcement and favorable selection. Legislation which requires cleanliness of restaurants exemplifies macro-niche selection. Restaurant managers who do not respond to these legislative changes are negatively reinforced by health inspector sanctions. Such negative reinforcement may lead to unfavorable selection.

Within the milieu, organizational units also face selection pressures. As studied by Freeman and Hannan (1983), when environmental (milieu) conditions change, individual restaurants who do not fit environmental demands may face higher probabilities of unfavorable selection. For example, restaurants in areas of seasonal demand, e.g., tourist areas, face selection pressures. Selection occurs as these restaurants are unable to attract resources in the face of changing milieu conditions. Reinforcement comes from making decisions about restaurant operations which are lucky enough to fit changing milieu conditions.

Organizational forms face selection pressures from macro-niches and milieus. Within macro-niches, organizational forms must acquire resources. Selection occurs as organizational forms fail to be reinforced by garnering critical resources. In the restaurant industry, the fast food restaurant population (an organizational form) must acquire resources from key actors. As customer tastes change and turn away from fast foods to ethnic cuisine, fast food restaurants as a population do not receive reinforcements from the macro-niche, and begin to face increased likelihood of mortality. Selection within the macro-niche occurs to organizational forms as the resource demands from actors comprising the macro-niche are modified.

Within milieus, organizational forms also face selection pressures. Economic, political, technological, and cultural transitions may lead to different forms being favorably selected. As disposable personal income increases and as more families have dual careers, the money spent on dining out may increase. Such economic and cultural transitions affect the restaurant forms which receive reinforcement. Upscale restaurants meeting the expectations of the changed milieu conditions may be more favorably selected than restaurant forms emphasizing cheap, low quality food.

We have illustrated a framework for understanding selection processes. Selection occurs by external activities setting conditions which affect the survival of organizational units and forms. External activities may be clustered in micro- and macro-niches and milieus. Selection processes occur within each of these cells.

RELEVANCE OF THE POPULATION PERSPECTIVE

While debates about defining units of analysis and selection processes continue in the population perspective, we should highlight the relevance of such debates for skeptics of the population perspective. Most of the concepts in organization science evolve from other disciplines, e.g., sociology, economics, political science, and psychology (Astley & Van de Ven, 1983). As the concepts from these disciplines have been applied to understanding organizations, promises generally exceed results. Disciples of each discipline often argue that the concepts from that discipline will revolutionize and integrate organizational science. In fact, each discipline adds pieces of understanding of how organizations behave and helps complete an organizational puzzle. Like blind people feeling different parts of an elephant, no one discipline can fully describe the complex organizational phenomenon.

In a similar vein, the long-term relevance of population perspective models to organization science rests more on promises than fact. Implicit promises that the population perspective will reorient organizational science rest more with hope than reality. However, the population perspective may supplement existing theories and frameworks and add pieces to the organizational puzzle by emphasizing how environmental constraints lead to the survival of organizational units and populations over time. The definitions we suggest above should help in developing research agendas for studying selection process on organization units and forms in niches and milieus.

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