DISRUPTIVE INTERACTION. EMERGING ISSUES AND RESEARCH PROPOSITIONS

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Abstract

The paper starts from the concept of "disruptive innovation" proposed within the innovation literature by Christensen in 1997. After a brief review on the diffusion of this concept in the management literature and of the types of interactions within the IMP literature, the paper points out a new construct: the "disruptive interaction". The paper describes this new conceptualization by exploring the effects that interaction generates for the actors in relationship. The paper defines the character of the concept of disruptive interaction and studies the implications for the company and the business network by defining some research propositions.

Keywords: disruptive interaction, business relationship, business network, innovation, change

2) Work in progress

Introduction

This article proposes the new construct "disruptive interaction" to analyze the relationship between two actors in a network context. The concept of "disruptive interaction" offers the vision of an interaction that generates processes of radical change in at least one of the two parties.

From the theoretical point of view, the paper, starts from the contributions that have dealt with the concept of "disruptiveness", namely a radical change that generates elements of irreversible change with the past. In particular, the paper analyzes the contributions that have emphasized this aspect with regard to the topic of innovation. Within this literature, in fact, the concept of "disruptive innovation" has been proposed to point out differences with the concept of "sustaining innovation", since the former generates change that creates new markets and radical change with the past (Christensen, 1997). Our literature review starts from the seminal book of Clayton Christensen, Professor at the Harvard Business School, "The innovator's dilemma: the Revolutionary Book That Will Change the Way You Do Business". This book since its release has sold over 200,000 copies (Danneels, 2004) and have been discussed in a variety of academic disciplines and topic areas (Klenner et al 2013).

The study of "disruptive innovation" is analyzed in the paper, emphasizing the relationship with the concept of interaction, proposed within the IMP literature (Ford and Håkansson, 2006). Interaction has recently received a renovate attention within marketing and purchasing literature and very is a growing interest among scholars in trying to categorize it according to new conceptual typologies (Håkansson and Waluszewski, 2013)

The main contribution of the paper is to highlight a different perspective of interaction. This paper extends prior research basically trying to answer to the following research questions: Is it possible to identify business to business interactions that could be "disruptive" according to the Christensen's approach? What kind of implications could emerge for the counterparts involved in this kind of business to business relationships? What kind of implications could emerge for the business to business network?

To address this aim, we formulate and discuss the concept of "disruptive interaction". The link between innovation and interaction is strong, as both by definition generate processes of change for the company. As it is possible to point out a "disruptive innovation" opposed to incremental innovation processes, in the same way, in the paper it is assumed that in addition to the interactive processes of an ordinary nature, there are cases of "disruptive interaction" with irreversible effects in the activities and resources at least of one of the actors in interaction.

The paper provides a conceptualization of interaction which is useful for understanding actor's change within the business network. The remainder of this paper is organized as follows: in the next section we review the concept of disruptive innovation according to the Christensen's view; the following section presents a discussion of the diffusion of this concept in management literature; after we describe how interaction has been categorized in recent IMP literature. The last section proposes and discusses the new construct of "disruptive interaction" and give some conclusion with directions for future research.

The disruptive approach to innovation

In his best-seller, Christensen (1997) analyzes the reasons for the failure of companies that were famous cases of success. Companies at the top of their respective industries fail as a result of radical changes in technology and market. To explain the reasons for this failure is proposed a theory of disruptive innovation through the study of some cases of companies that were leaders in their respective industries, with the reconstruction of the history of specific contexts such as the hard disk drive industry and mechanical excavator industry .

The reasons for the failure of leading firms, previously well-known as examples of good management, are not easy to explain. These organizations do not appear to present obvious weaknesses (for example, poor planning, resources and capabilities not adequate etc.). In the introduction of the original edition, Christensen remembers as emblematic examples companies such as Digital Equipment Corp. (DEC) or Sear Roebuck, for decades considered among the best managed in the world (Christensen 1997, xi).

These businesses fail because they have to deal with changes in technology and market structure. The adoption of good principles and management tools do not seem to be enough to prevent their failure. Paradoxically “good management was the most powerful reason they failed to stay atop their industries. Precisely because these firms listened to their customers, invested aggressively in new technologies that would provide their customers more and better products of the sort they wanted, and because they carefully studied market trends and systematically allocated investment capital to innovations that promised the best returns, they lost their positions of leadership” (Christensen 1997, xv). In other words, it is the decisions based on the information available on the market as it is today, along with the adoption of good practices management, to determine the failure. The same causes which are the basis of success at an early stage to lead business leaders to failure in a subsequent phase.

The capacity of organizations are seen to reside in two aspects: the organization's processes and values of the organization. But these are not flexible in the face of a changing environment. “A process that is effective at managing the design of a minicomputer, for example, would be ineffective at managing the design of a desktop personal computer. Similarly, values that cause employees to prioritize projects to develop high-margin products, cannot simultaneously accord priority to low-margin products” (Christensen 1997, xxvii).

Consequently, the principles of management are seen as valid not absolutely, but only as appropriate to specific situations. The change in these situations makes poor a system of heuristic rules or practices adopted (Guercini 2012). But under what conditions those considered best practice and rules to follow lose their validity? If the rules of good management are only situationally appropriate, how can we recognize the time of the change in the situation or context? What principles can be adopted to recognize the changing environment that requires a change in practices to be adopted? Since the practices and the heuristics used are fundamental to the organization of the actors, this is to recognize the time when it is essential to change the organization.

Christensen calls "disruptive innovation" the change in technology and market structure (business models) that renders obsolete the management practices adopted by companies leading up to that moment. The innovation is defined with reference to a broad concept of technology that “means the processes by which an organization transforms labor, capital, materials, and information into products and services of greater values”, whereby “all firms have technologies”, while “innovation refers to a change in one of these technologies” (Christensen 1997, xvi, 10).

New technologies are divided into "sustaining technologies" and "disruptive technologies". The distinction is based on the impact that technology has on the dynamics of actors rather than on the "pace of technological process". The sustaining technologies are new

technologies that fuel growth in the performance of the product. Instead, the "disruptive technologies" produce innovations that result in worse product performance, at least at first. These technologies produce a radical change in the rules of the competition between market players. The disruptive technologies "bring to a market a very different value proposition than had been available previously" (Christensen 1997, xviii).
It may seem a paradox that technologies that offer the worst performance of the product may be not only successful, but may even lead to the failure of the market leading companies operated on the basis of methods hitherto considered role models. For Christensen this is because "the pace of technological progress in products frequently exceeds the rate of performance improvement that mainstream customers demand or can absorb" (1997, xxvii).
Business leaders base their leadership on developing sustaining technologies, which provide the highest performance product. The followers in this case have technologies with performance similar to that of the leaders. These are the companies that have disruptive technologies that radically change the value proposition offered to the market. Particularly in "disruptive innovations, where we know least about the market, that there are such strong first-mover advantage" (Christensen xxvi). This is for Christensen "the innovators dilemma": doing the right thing or the wrong thing? This is because at the time of the disruptive change doing the right thing is the wrong thing.

The academic debate on the disruptive innovation approach

Since the concept of "disruptive innovation" was coined and then deeply analyzed by Christensen (1997) in his seminal work, many scholars have discussed potential implications within a variety of management fields (Daneels, 2004). It has been argued by Adner (2002), that this concept "has had a profound effect on the way in which scholars and managers alike approach technology competition and has prompted a reassessment of the ways in which firms approach technological threats and opportunities" (Adner 2002, p. 667).
One of the main area of further development of the Christensen's approach is how to define "disruptive innovation". In other words, the question of "What can be considered disruptive innovation?" has been considered only partly answered by the work and the subsequent articles by Christensen. In fact, it has been pointed out that the concept of "disruptive innovation" covers different meanings (Yu and Hang, 2011).
Markides (2006) for example proposed a finer categorization of disruptive innovation. He proposed three different "disruptive innovation" assuming that in each case it is possible to identify different competitive effects, diverse responses from incumbents and different ways in which the disruptiveness of the innovation emerges. A triadic categorization is then proposed. Markides (2006) pointed out that along with "*disruptive technological innovation*" namely the disruptive innovation proposed by Christensen in his book and articles, two other "disruptive innovations" could be identified. In particular, in his work Markides described "*disruptive business model innovation*" and "*disruptive product innovation*", and how they differ from "disruptive technological innovation" (Table 1).

Table 1. Two other "disruptive innovations" according to Markides (2006)

	Disruptive business model innovation	***Disruptive radical product innovation***
Meaning	• Business model innovation is the discovery of a fundamentally different business model in an existing business	• Disruptive product innovation is a radical innovation which creates new to the world products.
Main aspects	• The new business model is disruptive if: (a) extend the economic pie by attracting new customers; (b) expand the existing market by convincing existing customer to consume more • Do not implies the launch of a new product or a new service, but the redefinition of what a product o service is and how it is provided to the customer • It requires a different and conflicting value chain from the ones of incumbent company	• New products are disruptive to consumers because they perturb prevailing consumer habits and behavior in a major way • Disruptive product innovation results from a supply push process rather than demand pull approaches; • The ear1y pioneers that create the radical product innovation are very rarely the ones that capture the market, while latecomers' products are general preferred by the average consumer
Level of disruptiveness	• For an incumbent is very difficult to make the two (new and established business models) coexist and herein the dilemma for them is whether to accept it or not	• The new product undermines the competences and complementary assets on which existing competitors have build their success
Main difference with disruptive technological innovation	• It is not true that, as in the case of technological innovation, the only way to face with disruption is to accept it and find new ways to exploit it. Rather firms may invest in their existing model to compete more aggressive with the new business model	• To exploit disruptive product innovations established companies should not attempt to create such innovation but should give the task to small or start up firms. In other words, established firm may consequently create and nurture a network of feeder firms
Examples	• No frills business models in airlines; Internet banking and Internet brookerage; Internet bookstores	• Car; Television, Personal Computers, Mobile phones

Source: elaboration on Markides (2006)

The academic debate developed also around the main critiques on the Christensen's conceptualization (Rao et al. 2006).
In fact, one of the main criticism is related to the fact that the concept is mainly referred to an ex-post perspective. This means that it is difficult to understand whether a technology could be disruptive before its launch and development within the market.
Adner (2002), studied the demand conditions that let answer to the following research question: "When are technologies disruptive?". In particular, the author proposed two new constructs looking at the demand side, rather than the technological side, of "disruptive innovation". He identified two customer preferences that give suggestions on the disruptiveness of a technology. The first, the *preference overlap*, refers to "the extent to which development activity that is valued in one segment is also valued in another segment", while the second, the *preference symmetry*, refers to "the symmetry of the preference overlap". By categorizing demand structure according to these two kinds of preferences, the

author pointed out the different market incentives that firms face as their technologies advance.
At the same time Rafii and Kampas (2002) proposed a decision making methodology identifying a *six stage model* that a disruptive innovation can pass. The model is developed to help incumbent in identify the potential disruptiveness of a technology early and formulate a response strategy. The stages are sequentially: 1) foothold market entry; 2) main market entry; c) customer attraction; d) customer switching; e) incumbent retaliation; f) incumbent displacement. In each of the stage the technology may fail or may develop and become a "disruptive technology".
As the disruptive potential emerge as a key aspect in studying the construct (Keller and Husing 2009), in a recent contribution Klenner et al. (2013) synthesized three main ex-ante approach studying the disruptive potential of new innovations: (a) scoring and analysis models; (b) economic models; (c) scenario and situation analysis. The authors in pointing out the importance of the analysis of the perspective of a potential threat of disruptive innovation proposes a new construct "disruptive susceptibility", to "analyze market readiness for a potential entry and successful market utilization of disruptive innovations" (p. 3) and to help "companies develop and early warning system to identify market utilization of these innovation" (p.11).
Husig et al. (2005), pointed out other criticisms to the Christensen concept to develop further the theory. They pointed out that criticisms can be categorized according to both the ex-post perspective and the ex-ante approach. Within the first type of perspective, he argued that one criticism refers to the likelihood of disruption that is not universal. Differently from the assumption of Christensen, it varies according to the firm, technologies and industries under investigation (Husig et al. 2005, p. 20). Moreover, they pointed out how in the literature authors argued that the initial perception of threat leads to firms overcommitting resources to disruptive technologies rather than starving from a lack of resources. It is also highlighted that the presence of high switching cost and lock in situations that may reduce the disruptiveness of a technology is only partly considered in Christensen's works. From the ex-ante perspective point of view it is then considered that the high market uncertainty, and, in particular, the difficulties related to the forecast of the rate of technological progress make very difficult to identify the disruptiveness. However, even Husig et al. (2005) then proposed a model that tried to asses technologies for their disruptive characteristics.
Moreover, other assumptions on "disruptive innovations", such as the fact they are always cheaper, simpler, smaller and more convenient to use needs further research (Klenner et al. 2013).
However, although some criticisms the "disruptive innovation" approach had an "enormous impact both in the business and academic communities (Tellis, 2006). For example, Tellis (2006) found that the term "disruptive innovation" in a search on Google had more entries with respect to other important terms such as "radical innovation" or "architectural innovation". Moreover, Danneels (2004) encouraged further research on disruptive innovation, as the concept's implications have not been yet revealed, he pointed out several themes and questions for disruptive research, where the definition of the concept of "disruptiveness" remains central.

Interactions and change within the IMP literature

Within the network approach, interaction becomes crucial to understanding the effects that a relationship may have on the firm and the entire business network. Two main dimensions have been analyzed in depth through the IMP approach (Håkansson and Snehota 1995): on the one hand, (a) “what” is affected (substance) and, on the other, (b) “who” is affected

(function). Considering such dimensions, the ARA model has been proposed and debated in all its details within the IMP Group. In the market-as-network approach, the interaction among actors – mainly, though not exclusively, customers and suppliers – is regarded as crucial for obtaining information to be used by the firm, for example, to achieve innovation, but it is also seen as a resource to lever in order to obtain competitive advantage.

Within the IMP approach, interaction has been associated to some issues that may help provide a key to understanding it, amongst which "relativity" (Ford and Håkansson, 2006) plays a relevant role. According to Ford and Håkansson (2006), relativity refers to the fact that "…interaction creates a relative and dynamic structure over time…. every actor in a network has a specific position…In the short term these positions provide the multiple and relative contexts for interaction. In the long term, continuing interactions successively change these positions and this structure" (page 13). The study of network dynamics and change has attracted increasing attention from IMP scholars, even though "dynamic interaction between single actors and how this relates to the development of the total structure of a network is not a theme that has been focused in many areas of research" (Håkansson and Ford 2006, page 13).

The definition of potential *types of interactions* has been addressed within IMP literature by several scholars and many categorizations have been proposed (Håkansson et al. 2009).

Starting from the two extremes of short-term episodes and long term processes, Homlund (2004), for example, proposes a novel categorization of aggregation levels of interaction, where interactions are categorized into five types of that are on five different aggregation levels, namely *action*, *episode*, *sequence*, *relationship*, and *partner base*.

Medlin (2004), focusing on interaction in a time perspective, has underlined the distinction between "*exchange interaction*" and "*adaptive interaction*" (Medlin 2009, p. 10). *Exchange interaction* takes the form of a discrete transaction in which the counterparts propose and agree on the "best" time. Regarding instead *adaptive interaction*, time is the dimension of the interaction that defines what we can produce. In other words, time has a central role as an element within which interaction occurs, while in the "exchange" view time has a central role as an attribute to be exchanged in the transaction.

However, as stated by Håkansson and Waluszewski (2013), "there are a wide variety of industrial marketing and purchasing interactions. Sometimes they involve a few people representing a narrow supplier–user interface, where what is going to be delivered and how it is going to be used is easily solved; many of these types of processes are highly standardised and routinised. Other interactions are more complex and require intense problem-solving, including involvement of a set of managers and specialists related to both sides of the supplier–customer interfaces" (p.1). In other words, the two authors pointed out how it is difficult to define what kind of interactions could be in the empirical world, as they are multifaceted and covers a wide spectrum of situations.

By intertwining interactions with the effects on the four resources (products, facilities, business units and business relationships) identified in the very well know 4R model within the IMP literature, Cantillon and Håkansson (2009) proposed a six type of interactions. The two authors discussed how interaction affects resources, and how changes in the resources are related both to the single party and the network level. Table 2 shows the main features of each type of interaction identified by Cantillon and Håkansson (2009), which have been then deeply discussed in Håkansson and Waluszewski (2013).

Table 2. Six types of interaction according to Cantillon and Hakansson (2009)

Type of interaction	Affected resources	Main aspects
Pure exchange	• Products: no change • Facilities: no change	• There are no changes in any resources involved in the relationship • It is considered to be a exception in the

	• Business units: no change • Business relationships: no change	real world and more coherent with the neoclassical vision of the market • It can be considered as "thin interaction"
Exchange with some social elements	• Products: no change • Facilities: no change • Business units: *minor change* • Business relationships: *single*	• Interaction affects only the two parties involved in the relationship • They have both advantages (because they can be considered the starting point for other kinds of interaction), but at the same time can have disadvantages (because they may affect negatively both efficiency and productivity) • It can be considered a "light cooperation"
Buying and selling	• Products: *change* • Facilities: no change • Business units: *minor change* • Business relationships: *single*	• Interaction affects the product, which is not given, rather, it is the result of the interaction between the two parties • This kind of interaction involves both the joint development of the design of the product and the negotiation concerning the economic compensation
Producing and using	• Products: *change* • Facilities: *change* • Business units: *minor change* • Business relationships: *single*	• Interaction affects all resources. • It does not imply necessarily a close interaction/relationship between a buyer and a seller. Instead it implies that one of the two parties realize the importance of being related with the counterpart
Cooperation	• Products: *change* • Facilities: *change* • Business units: *change* • Business relationships: *single/multiple*	• Interaction affects all resources, but differently from the previous types of interaction, it involves changes of some importance for direct and indirect counterparts related to the actors in interaction • Multiple business relationships are involved and this may change the network structure
Networking	• Products: *change* • Facilities: *change* • Business units: *change* • Business relationships: *multiple*	• Interactions are aimed at generating networking effects, in order to change not only the two counterparts but their relationships • While in the other kinds of interaction (especially the fifth) the networking effect is indirect, here the actors' aim is to generate network forces to support the interacting parties

source: elaboration on Håkansson and Waluszewski (2013)

Starting from this categorization, in fact, Håkansson and Waluszewski (2013) in their comprehensive and conceptual article on interaction typologies, tried to discuss further the differences among interactions by identifying factors influencing them and outcomes of the different interaction types. They described three factors which influence the emergence of different types of interaction: (a) earlier interaction patterns; (b) strategies of interacting companies; (c) basic social, political and technological context. Moreover, one of the main result of the work is the discussion of three potential outcomes of the different interaction patterns. According to Håkansson and Waluszewski (2013) in fact the interaction patterns'

outcomes may be considered in terms of innovative effects, namely the innovation process that is embedded in the interaction pattern, productivity effects, due to the interdependency in the interaction pattern, and power, namely the distribution of power and the consequences in terms of profit.
But as the authors suggested, interaction is a never ending story and there may be spaces for future research aimed at studying "much more precise ways to describe, characterise and analyse single interactions as well as patterns of interactions, and above all, their consequences for single companies, for the larger business landscape.." (p.10).
In the next section, we will try to address this quest on interaction by proposing a new construct that will help to understand the outcomes of the interaction according to a different perspective, that of "disruptive innovation".

From disruptive innovation to disruptive interaction: research questions and propositions

The concept of "disruptive innovation" proposed by Christensen (1997) is defined both in terms of product performance (disruptive product technology) and new value proposition to the market (disruptive business model).
In the IMP approach to the study of interaction types, different interaction patterns are distinguished on the basis of the different potential outcomes that may result from them (Håkansson and Waluszewski 2013).
In this article we propose a concept of "disruptive interaction" based on the type of outcome that results from the interaction, consistent with the principles set out in the recent IMP literature. According to the construct we propose, the interaction is disruptive when it produces actor's learning in completely new fields and the formation of competences of new kind. The disruptive nature of the interaction does not permit a continuation of a previous learning process, but the beginning of a new path with new criteria for evaluating the performance for at least one of the two actors involved in the interaction. The interaction is disruptive because it modifies the criteria for assessing the progress of the actor and the interaction.
This work in progress article introduces the construct of "disruptive interaction", but it requires further research. Emerging research questions include the followings:

1) How can the disruptive interaction concept be defined?
2) How the disruptive interaction is different from other types of interaction already discussed in the IMP literature?
3) What are the outcomes of disruptive interaction?
4) What are the effects on the actor in the interaction?
5) How does disruptive interaction emerge?
6) What are some examples of disruptive interaction?

Given the link between these questions and the current state of our research, in this section we will try to develop some reflections of the whole rather than responding to each question.
An interaction is disruptive because of the effects it has on at least one (or both) of the actors involved in the interaction. It is related to the actor and it is defined by the effects it has on it. Disruptive innovation takes into consideration the effects on the incumbent of the new technology without a focus on the effects of new interactions. In fact, the disruptive interaction is an interaction that completely changes the rules of the game for the players

involved. The disruptive interaction changes the actor, by changing its criteria for evaluation of its performance and that of the interactions it has. This leads it to act differently in the network of actors.
In other words, it is not possible to go back after a disruptive interaction. The organization changes its way of acting in the network, by changing the resources, activities, and actors with which it is related. Conversely, interactions that are not disruptive, as in the case of sustaining innovation, lead to change (incremental or substantial) along the same path and following by the same criteria.
The study of the history of the disk drive industry offers two types of technological change. The technologies of the first kind "sustained the industry's rate of improvement in product performance", those of the second type "disrupted or redefined performance trajectories - and consistently resulted in the failure of the industry's leading firms" (Christensen 1997, 9-10).
The disruptive innovation focuses on the product. It involves worse product performance than sustaining innovation relative to the criteria used until then, establishing new criteria for evaluation of product performance. The disruptive interaction focuses on the actor. It involves worse actor's performance then sustaining interaction with respect to the criteria used so far, establishing new criteria for evaluating the performance of the actor and the interaction.
The construct of disruptive innovation has implications on product and business model. The construct of disruptive interaction has implications on actors, resources and activities.
The IMP categories proposed by Håkansson and Waluszewski (2013) highlight the effects of interactions on resources. They do not highlight the intensity of effects on the actors, which are mentioned but not specifically addressed in their study. The classification proposed in this paper examines the change at the level of the individual actor in interaction and the disruptive effects on the behavior of the actor. The disruptive interaction changes the rules of the game for the actor in a non-reversible way. As the industry after the disruptive innovation is different, the actor after the disruptive interaction is different. In the IMP approach each actor is the result of the interaction and all the times that interacts the actor changes. But there are also strategic interactions that do not change the path of evolution and the parameters to assess the performance of the actor and that of the interaction. With the construct of disruptive interaction we highlight the role of those interactions that break the rules of the game for the single player.
The disruptive interaction doesn't only increase the performance of an organization, but makes it able to do anything else, to offer a different value proposition, to organize activities and resources to relate with other actors, in an area not previously experienced.
In this sense, the disruptive interaction is an interaction that leads to a radical change for the organization. The point is not how much the actor can learn in interaction but if the new learning path in interaction is related or not with the learning path emerging from previous interactions. . It may present less complexity than the previous interaction that, by analogy with the terms used in the disruptive innovation theory, we call sustaining interaction.
Because the interaction is disruptive, the change that defines it must regard at least one of the two actors, but may not necessarily be related to both. This suggests a further distinction between disruptive "symmetrical" interaction (where both actors are affected by the change in the fields of learning and criteria for assessing their performance and interaction performance) or "asymmetric" interaction, when the interaction is disruptive for an actor, but it is not for the other.
Examples of disruptive interaction are frequent in interactions between the acquiring and the acquired organizations in the acquisition process. Other cases may regard the interaction between a small business and a supplier or a client company with completely different set of

characteristics from those of previous suppliers or customers. In this case, the interaction can generate disruptive changes such as those defined above.
The outcome of disruptive interaction may not affect only the single actor or the two actors in the interaction, but its implications can affect the network and innovation. Surely the profound change of the evaluation criteria and performance induced by disruptive interaction radically changes the way the actor behaves in the network, and then the network itself. Finally, the disruptive interaction can generate disruptive innovation. In fact, the interaction can lead to new disruptive technologies, products, business models that have the characteristics of disruptive innovation defined by Christensen.
This produce a final consideration on the relationship between disruptive innovation and disruptive interaction.
What kind of relationship can be imagined between the constructs of disruptive innovation and disruptive interaction? In our interpretation, it is possible to consider an analogy relation and an implication relation. According to an analogy relation, disruptive interaction is a construct created by analogy from the disruptive innovation, but it is a concept distinct from it, because the presence of disruptive interaction does not imply the coexistence of disruptive innovation. According to an implication relation, the disruptive interaction is an interorganizational side of disruptive innovation. In this case the two constructs correspond to phenomena that coexist and are linked together.

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