

A Social Psychological Perspective on the Forming of Path Dependence in Old Industrial Regions

—The Case of Shanxi Province in China¹

PERSPECTIVE SOCIALE ET PSYCHOLOGIQUE SUR LA FORMATION DE LA VOIE DE DEPENDANCE DANS LES VIEILLES REGIONS INDUSTRIELLES

—CAS DE LA PROVINCE DU SHANXI EN CHINE

Cao XuanWei² Xi Youmin³

Abstract: Among so many research literatures in industrial cluster, there lacks still exploration to the possible risks of industrial cluster. Path dependency, which is absolutely not only a phenomenon in technological development, existing not only in an organization but also in the process of cluster development, has been neglected at certain degree in developing regional cluster. The aim of the paper is to address the question of how the micro foundation of path dependence can be explained through a social psychological perspective. By referring to the two concepts from social psychology, selective attention and identity, this paper illustrates the psychological factors leading to the forming of path dependence in industrial cluster.

Key words: industrial cluster, path dependency, regional identity, selective attention, social psychology

Résumé: Parmi de nombreux documents de recherches sur le bloc industriel, il manque encore des explorations sur les risques possibles du bloc industriel. La voie de dépendance, qui n'est pas seulement un phénomène dans le développement technologique, existant non seulement dans une organisation mais aussi dans le processus du développement du bloc, a été négligée dans certaines mesures dans le développement du bloc industriel régional. L'objectif de cet article est d'exposer comment la micro-fondation de la voie de dépendance peut être expliquée dans une perspective sociale et psychologique. Se référant à deux concepts de la psychologie sociale-attention sélective et identité, cet article illustre les facteurs psychologiques qui conduisent à la formation de la voie de dépendance dans la bloc industriel.

Mots-Clés: bloc industriel, voie de dépendance, identité régionale, attention sélective, psychologie sociale

We should not take it for granted that regional clusters will always going along a well designed plan to stimulate the development of local region to be "innovative and competitive". There are also risks in the development of regional cluster, such as 'lock-in' resulted from path dependence (Grabher, 1993).

Regional cluster, as the "interactive results from economy and society", has a typical character of social embeddedness in its development. Though recently explanations to the dynamics of regional clusters "have increasingly turned from 'economic' reasons, such as external economies of scale, to 'social-cultural'

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² School of Management, Xi'an Jiaotong University, China.

³ School of Management, Xi'an Jiaotong University, China.

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reasons” (Regional Clusters in Europe), the micro-foundation of path dependence has been largely neglected (Heffernan, 2003). Especially clear evidence from many formerly successful but specialized old industrial areas were ignored in much of the cluster discourse (Chapman, 2005). Among the few literatures from the perspective of sociology, Seri (2003) pointed that selective attention is an important reason for the stagnation of regional development and path dependence. Some other concepts from social science were also introduced recently to the research of industrial cluster. For example, organizational identification is thought to be one of the influential factors to the development of regional cluster (Sammorra A. & Biggiero L., 2001). As a response to Storper’s initiative of re-focusing the investigation of regional industrial districts from the traditional structuralist and macro-founded approach to the behavioral basis of inter-firm relations, this paper would like to make an exploration about the risk in the development of regional cluster as a point of departure, instead of exploiting further the positive sides of cluster from a macro perspective.

In view of the social embeddedness of regional cluster, it would be a contribution from the perspective of social psychology to analyze the limitation and risk especially the path dependence of regional cluster.

1. PATH DEPENDENCE IN THE DEVELOPMENT OF REGIONAL CLUSTER

1.1 Definition of path dependence

The concept of path dependence can be tracked back to David’s illustration of the suboptimal of keyboard technology (David, 1984). Due to the increasing returns, scale economy and irreversibility, we were stuck to the suboptimal technology and excluded other technologies

with higher efficiency. Path dependence depicts the phenomena of the existence of suboptimal in spite of the principle of maximization of utilization. And the view of path dependence makes the “past events”, especially, small events, history, an influential factor to the final result. Athur(1988) regards that the evolution of many modern technologies follow the logic of increasing returns. And sunk costs, learning effect and coordination costs are all factors to the lock-in of organization to the special technological trajectory.

There are wide spread reflection of the view path dependence in social, economic and technological fields. For example, organizational routines in organization can influence potentially and guide the behavior of members. The economic system is embedded in the institutional context, in which it operates. This is what North (1993) pointed: the selection that people made in past to institution decides the possible selection set currently. History makes matter in the selection of path for the institutional change.

Following the logic of path dependence, we would define path dependence in industrial cluster as a process of presenting inertia in technological, institutional, cultural and cognitive aspects, which as a result of following the historical trajectory leads to lock-in finally in a specific region.

1.2 path dependence in the development of industrial cluster

Though much of researches in regional cluster aim to the analysis of successful clusters, it was identified since 1990’s by a few researchers that there may have risks in developing regional cluster. Grabher (1993) made a survey to the Ruhr region in Germany, pointed out that the stagnation and devolution of Ruhr region was suffered greatly from the ‘lock-in’ effect. Sydow (2003) abstracted the evolution process of path dependence from a view of organization science.

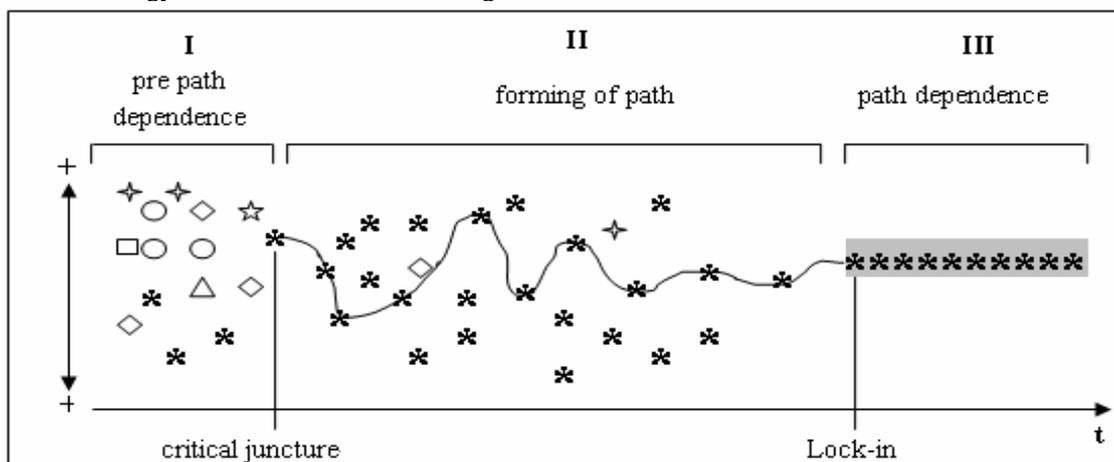


Figure 1: the forming of path dependence (adapted from Sydow, 2003)

Note: kinds of symbol in this figure represent different industries in a region. For example, steel, coal, machinery, electronics, and so

With the changing of environment and the change of resource allocation in organization, once a particular industry was identified, a specific industrial structure would be formed and at the same time lost the capability to develop other industries, resulting to the 'lock-in'. In the following sections, the case of Shanxi Province, an old industrial region in Northern China illustrates further the forming of path dependence. A seem research by Tödting and Trippel (2004) on the regional cluster in Styria, Austria notes that, those old industrial regions were at certain degree suffered from the 'institutional sclerosis' to be the sacrificer of the past success. The past success would bring some social psychological influence in the region.

According to the structuration theory by Giddens, industrial cluster can both the result of actors' action and the source for the action. Path dependence can also be the result from actors' decision and behavior, while at the same time, be a limitation to actors' behavior capability. So, the essential character of industrial cluster, social embeddedness, decides the social psychological influences on organizational path.

2. INFLUENCE OF SOCIAL PSYCHOLOGICAL FACTORS ON PATH DEPENDENCE IN INDUSTRIAL CLUSTERS

2.1 selective attention

2.1.1 definition

In their research about the change of institution to economic performance, North and Denzau (1996) have pointed that shared 'mental model' has a connection with the influence from collective structural, persistent forms of behavior. And they pointed also, these psychological concepts, for example, mental model and schema can be the core of micro basis for the forming of institutional inertia.

Such a constructed mental model would in turn be a device for directing selective attention process (Anderson, 1990. Chap 5). Selective attention refers to the phenomena, that when facing complex sight stimulation, selective attention would make the concentration on those stimulations with relative tasks, while ignoring unrelated stimulations.

According to the view of Austrian Schools in psychology, the basic process of human brain and mind lies in receiving, interpreting and giving significance to external stimuli (information) and "reality is selectively perceived, cognitively rearranged, and interpersonally negotiated" (Garud, Rappa, 1994). Rizzello (1997) points out the path dependence features of this process at the neural level: 'human brain organizes external stimuli by classifying them in the previous neuronal

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structures, which citoarchitectonics results from the innate neuronal characteristic and the previous classifications of other external stimuli, depending on the subject's previous experience'. The so constructed 'mental model' works as an evaluating function in the human mind. It re-shapes and selects the stimuli coming from the environment forming a mental 'image' of the state of the world that, in turn, define behavior.

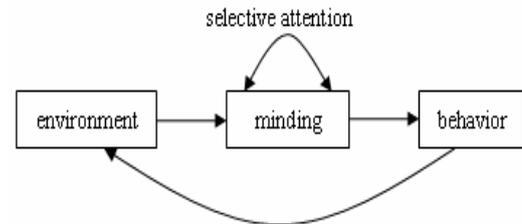


Figure 2: The process of minding

The existence of selective attention equals to a filter in our mind, which make people concentrate on "what they wan to see" and "what they could see", while deviating completely the true situation of a thing. From the cognitive perspective, this kind of mental model, focusing long time on a certain local point, belongs to a deviation in cognitive anchoring. In his studies on organizational learning, March (1981) noted "managers rely on the learned response mode, instead of exploring new effort. And these modes are self reinforcement structurally and cognitively" and "more emphasis on exploitation would exclude the exploration to new things, incapable of developing new capacities". Giddens (1984) explained this phenomenon from the structuration theory to be a self reinforced blindness (we don't see what we couldn't see). Under the positive feedback loop, this self reinforced blindness trap organization reflexively into path dependence.

2.1.2 Selective attention in developing industrial cluster---the case of Shanxi Province

Shanxi, situated in the north of China, is the largest and the most important of China's energy supply region and one of the industrial heartlands of the national economy during planning economy.

Within the context of a national strategy to promote the "modernisation" of the Chinese economy in 1980s, Shanxi was designed the "base of energy, heavy and chemical industries" by the central government due to its abundant coal resources and other natural resources.

Until 1998 the price of coal was controlled by central government. In order to cater for the development of the national economy, China's coal industry adopted the so-called "Letting the large, medium and small size coal mines develop simultaneously" policy. This policy caused huge increases in coal production and coal supply and consequently resolved the coal shortage problem that had fettered the development of China's economy for a long time, with state-owned coal mines, provincial coal mines and small township coal mines setting up at the

same time. Under this policy, encouraging investments from all of sides, Shanxi was trapped deeper into the mono coal industry structure. During the first 3 years of the “7th five-year plan (1986-1990)”, more than 70 percent of industrial investment in Shanxi was put into the energy infrastructure construction. This resulted not only to the further “lock-in” into mono coal industry but also to a serious suffocation of other prosperous industry branches. At that time, Shanxi had in fact some powerful industry branches, such as hydraulic component, textile machinery, electronics, and mechanical manufacturing. But due to this “selective attention” by policy makers, Shanxi was deemed to the “lock-in”.

During the planning economy time, it is not wonder, the result of such a “lock-in” would be that the more coal was produced, the more lost Shanxi Province had to burden and the wider distance exists between Shanxi Province and the national average development. After more than 20 years development, the economy of this region had been transformed from a booming core in the 1980’s to a marginalised periphery by the end of the 20th century. In fact, Shanxi Province ranked at the initial time of Reform and Opening-up in 1978 the 16th in national wide comparisons in terms of Per Capita GDP performance. After 20 years development, in 1999 and 2000, the average income of Shanxi citizens was even listed as the lowest in China.

Table 1 and Table 2 illustrate the results of this “selective attention” policy.

Table 1. GDP Per Capita performance of Shanxi in comparison with China

	China	Shanxi	Lag
GDP per capita in 1978	379 Yuan	365	-4%
GDP per capita in 1990	1634	1528	-6.5%
GDP per capita in 2000	7078	5137	-27%
GDP per capita in 2004	10533	9150	-13%

Source: Shanxi Statistical Yearbook, 2001.

China Statistics Press 2001.

In 2004, the industrial added value from the four industrial branches in coal, metallurgy, coking and power generating occupied a ratio of 79.9% in the total industrial added value, and 47.4% provincial finance income were provided by these four branches. After two decades development, the economy structure in Shanxi presents still a higher ratio of heavy industry branches than national average level. It lacks still reasonable multiple dynamic economic sources.

Apart from the economic backward, Shanxi has to suffer the bitter of environment pollution and ecology destruction. According to the official bulletin in Bureau of Environment Protection of Shanxi Province on April 14, 2004, Shanxi Province ranked at the 30th position among all together 31 Provinces and regions in China in

terms of living support system, environment support system, economic development quality and environment quality. It is a terrible fact for the people in Shanxi Province.

Table 2. Growth performance of Shanxi in comparison with China

unit: billion Yuan

	China	Shanxi	Ratio
1980	4517.8	108.76	2.41%
1985	8964.4	218.99	2.44%
1990	18547.9	429.27	2.31%
1995	60794	1076.03	1.77%
2000	99215	1845.72	1.86%
2005	182321	4121.20	2.26%

Source: Shanxi Statistic Bureau, 2006

Due to the lacking of energy in 2004, Shanxi has achieved a recordable development in this year with GDP growth 14.1%, ranking as the 5th rapidly development region in China. And this trend seems not stopped in 2005. In this year, a remarkable achievement for local government is that, the provincial financial income reached 74.7 billion Yuan(RMB), accounts for 8.9 billion US\$. And that is an increase of more than 39% than the previous year, the highest increasing ration in China in this year. But in fact, it was only a virtuous spiral of path-dependent growth. Further analysis would disclose that this figure was contributed from the high ratio of coal, chemical, metal, etc industries, with a 68% in total GDP growth. So it is still nothing. A black humor among people reflects the special influence of selective attention on Shanxi’s economic structure.

‘Since the Reform and Opening-up, three kinds of people in Shanxi have been emerging: the first one, who dig coal mine; the second one, who wash the coal; and the third one, who make coking’.

2.2 Regional identity

2.2.1 Definition of regional identity

The concept of identity was put forward initially in psychology to illustrate the individual or collective actors, who present the character of self definition and categorization. In recent years, identity has been extended to the field of management and organizations. And organizational identity was identified as a central character of organization (Albert and Whetten, 1985). And according to the understanding of organizational ecologists, identity obtains not only from the personal identifications of individuals, which affect their perceptions of similarity or membership in groups, organizations, or other social entities (Polletta and Jasper 2001), but also from the shared understandings of

audiences, especially external audiences, about key features of the social entities (Pólos et al. 2002, Hannan et al.2004).

Regional identity is set up through the shared understanding of residents and external audiences to the region's characters. Häuszer & Frey (1987) regarded regional identity as a phenomenon where people identify themselves with the social system of a certain region (with its people, culture, traditions, landscape, etc). Eisenstadt (1998) described the development of shared understandings a collective identity.

2.2.2 Regional identity and path dependence

Regional identity will influence the development capability of a region through influencing the understanding of external observers and their choice for investment objective. A specific regional identity was formed through the interaction of regional history, culture, politic and industrial structure. For example, Pearl River Delta is regarded as the camp for manufacturing industries in China; while Shanghai is a location for international finance, trade and high technical industries; and Shanxi Province is an energy base for the development of China. Different regional identity solidifies further the industrial structure and economic development. This kind of positive feedback loop of regional identity will reinforce the cognitive and understanding of individual actors to this region, forming inertia in mind and producing behavior path dependence.

2.3 Selective attention, regional identity and path dependence

Selective attention would influence the choice to "path" by having an influence on decision-maker's thinking model; regional identification plays his roll in

influencing the action of "grass roots" at the cognitive and cultural levels and may strengthen the "dependence" of the chosen "path". From the objectives of their influences, the aim objective of selective attention can have influence on the objective of regional identification. In the shaping of path dependence, both decision-makers and actors can have their influences.

Among selective attention, regional identification and path dependence, it is a positive feedback. Selective attention is itself a judgment based on the review and summary to historical experiences. The "backward-looking logic of experience" from Gavetti & Levinthal (2000) demonstrated the forming of organizational routine on the basis of experience learning and local search. In this process of routine forming, the selective attention from decision-makers will have a direct influence on the actor's perception to surroundings and tasks. The result of the selective attention to established path strengthens further the regional structure and positioning, making the identification of actors to the region to be solidified continuously and thus forming a direction for their later action. After long-term accumulation, the social community presents path dependence at cognitive and cultural aspects. In turn, it is not easy to free from path dependency. The established path dependence will promote further organizational routinisation and modulisation of thinking from decision-makers, which helps decision-makers make further a local search (search at the neighboring fields of the current branch or knowledge realm) and solidifies the preferential selective attention of decision-makers; while path dependence will have influence to actors. Those routines and pathways from actors will make the actors lack of rethinking capabilities, under the roll of "routine drives out thinking", following or even strengthening the original identification. Figure 3 illustrates the relationship between the three items.

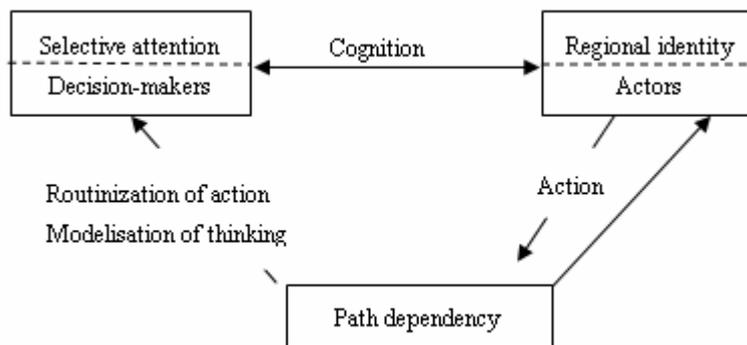


Figure 3 : selective attention, regional identity and path dependence

Both selective attention and regional identity play their role in contributing path dependence under the influence of social psychology. Following the research agenda of Grabher in studying Ruhr region's lock-in, this paper identifies four factors from structural, functional, cognitive and cultural aspects, which contribute to the forming of path dependence.

Selective attention would determine a region's industrial structure and function mainly through influencing policy makers; while regional identity is formed through the shared understanding from residents of this region and external observers and the historically accumulated culture influences. What kind of an identity from most of people will determine at a certain degree the regional cognition, and also the development

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THE AUTHORS

Cao Xuanwei, Xi Youmin, School of Management, Xi'an Jiaotong University, China.

Postal Address: No. 28, Xian'Ning W.Rd, School of Management, Xi'an Jiaotong University, Xi'an, Shannxi Province, 710049, P.R. of China.

Address: Institute of Management, c/o Prof. Jörg Sydow, Boltzmannstr. 20, 14195, Berlin, Germany.

Tel: 0049-30-838 56555 Fax: 0049-30-838 56808 E-mail: caoxw2002@hotmail.com

Xi Youmin, Prof. Ph.D, School of Management, Xi'an Jiaotong University, Xi'an, Shannxi Province, 710049, P.R. of China.