

# Eastern Thought and Systems Thinking

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# Introduction

- [ **East Asians** and **Westerners**, respectively as a group, have kept very **different systems of thought** for thousands of years
  - [ In contrast to the mechanistic and analytic Western view
  - [ Eastern view of the world is said to be organic
- [ Aims to seek the profound relation between ancient **Eastern wisdom** and modern **systems thinking**
- [ Focuses on **thoughts** of Three Essences (time, space, man), *Yin-Yang*(陰陽) theory, *Taoism*, Confucianism, and Buddhism

# Difference of Thoughts between Easterners and Westerners ( )

Subject	 <b>Westerners</b>	 <b>Easterners</b>
Basic thought process in ancient China and Greece	<b>Syllogism</b>	<i>Tao (道)</i>
Social life and sense of self in the modern age	<b>Independent</b> "Going it alone"	<b>Interdependent</b> "Living together"
Envisioning and perceiving the world	<b>Simple, Controllable, Analytic, Separate, Stable / Linear movement, Advance</b> "Keep your eye on the ball"	<b>Complex, Not easily controlled, Holistic, Interrelated / Changing Cyclical movement, Reversion</b> "Eyes in back of your head"

Nisbett R.E., 2004, The Geography of Thought.

# Difference of Thoughts between Easterners and Westerners ( )

Subject	 <b>Westerners</b>	 <b>Easterners</b>
Perception of causality	<b>Internal Factors</b> <b>Personal attributes</b>	<b>External Factors</b> <b>Situational factors</b>
Organization Of knowledge Child-rearing practices	<b>Static object</b> <b>Categorization and Rules</b>	<b>Relationships</b> <b>Similarities</b>
Experience vs. Logic	<b>Logic</b> <b>Law of non-contradiction</b> <b>Correctness</b> <b>Either/or</b>	<b>Experience</b> <b>Dialectics,</b> <b>Middle way</b> <b>Both/and</b>

# Universe as a System

[ Universe 宇宙 (Yǔ-Zhòu)  
→ The Largest System

[ Huai Nan Tzǔ [淮南子]  
- 宇(Yǔ) ≡ 四方上下 (3D Space)  
- 宙(Zhòu) ≡ 古往今來 (Time Flow)

[ Universe is a frame containing Time and Space

## Huai Nan Tzǔ

A compilation of various schools of thought made by the around 3,000 guests attached to the court of Liu An(劉安), Prince of Huai-nan(died 122 B.C.), in the Former Han Dynasty

# Thought of Three Essences (三才思想)

- [ In addition to **Time** and **Space**, the ancient Easterners paid attention to **Man** as a representative of **entia** in the Universe
- [ **Three Essences in the Universe**



- [ **Three Jiān (間)s in the Universe**
  - **Time** (時間 Shí-jiān)
  - **Space** (空間 Kōng-jiān)
  - **Man** (人間 Rén-jiān)

# Genesis of the Old Testament

1st Day

TIME

2nd~3rd Day

Space

3rd ~ 6th Day

Man & entia

## Genesis

In the beginning God created the heaven and the earth... God called the light **Day**, and the darkness he called **Night**... *[the first day]*

... Let there be a firmament in the midst of the waters... divided the waters under the firmament... the waters above the firmament... God called the **firmament Heaven**... *[the second day]*

... God called the dry land **Earth**; and the gathering together of the waters called he **Seas**... **grass**...**fruit tree**... *[the third day]*

...God made two great lights... he made the **stars** also... *[the fourth day]*

... **moving creature**... **fowl**...**great whales**... *[the fifth day]*

... **cattle**, and **creeping thing**, and **beast** of the earth... So God created **man**... **male and female**... *[the sixth day]*

# The Harmony of Three Essences

- ☉ Three Jiāns(三間) should be the fundamental factors for a complete system
- ☉ Harmony Principle of Three Essences

A system can get **completeness**  
by unifying spatio-temporal-human  
integrated factors  
and ultimately seeks for  
the **Harmony of Three Jiāns**

# Approach to Construct A Three Jiāns(三間) Integrated System

**SD**

**System Dynamics**

**Time Based Approach**

**GIS**

**Geographic Information System**

**Space Based Approach**

**OCT**

**Optimal Control Theory**

**Human Based Approach**

# Principles of Eastern Cosmology : *Tao*(道)

- [☯] *Tao* is the all-embracing first principle through which all things are brought into Being
  - ➔ The ultimate reality which underlies and unifies the multiple things and events we observe
- [☯] *Tao* is one of the most important terms in Eastern philosophy
- [☯] Lao-tzŭ(老子) gave *Tao* a metaphysical meaning

# Dynamics of *Tao*(道)

## Principal characteristic of *Tao*

- cyclic nature of its ceaseless motion and change

## Chou I (周易) : 'book of Change'

- "Nothing goes away that does not return, i.e., No departure without a return" [無往不復]

## Lao-tzŭ(老子)

- "The movement of *Tao* consists in reversion, going far means return" [反者道之動 遠曰反]

## Chuang-tzŭ(莊子)

- "Things when they reach one extreme must return" [物極則反]

# Principles of Eastern Cosmology : *Yin-Yang*(陰陽)

- [ ] *Yin-Yang* is the female and male principles
  - [ ] *Yin*(陰) : force representing female principle
  - [ ] *Yang*(陽) : force representing male principle
- [ ] Interactions of *Yin-Yang* are generally supposed to produce universal phenomena

<i>Yin</i> (陰)	<i>Yang</i> (陽)
-	+
dark	light
soft	hard
cold	warm
inactive	active
quiet	movement

# Dynamics of *Yin-Yang*(陰陽)

- ⌈ Cyclic motion of *Tao* was given a definite structure by the introduction of the polar opposites *Yin* and *Yang*
  - ⌈ The *Yang* having reached its climax retreats in favour of the *Yin*
  - ⌈ The *Yin* having reached its climax retreats in favour of the *Yang*
- ⌈ All manifestations of the *Tao* are generated by the dynamic interplay of *Yin* and *Yang*
  - ➔ Theory and symbol of *Yin-Yang* became the fundamental concept of Eastern thought

# TàijíTú(太極圖) & Yin-Yang(陰陽)

☯ **Zhōu Tun-yi (1017~73), a Neo-Confucianist**  
[ Composed the 太極圖 (Diagram of the Supreme Ultimate)

“The Supreme Ultimate through movement produces the **Yang**. This movement, having reached its limit, is followed by quiescence, and by this quiescence it produces the **Yin**. When quiescence has reached its limit, there is a return to movement. Thus movement and quiescence, in alteration, become each the source of the other. The distinction between the **Yin** and **Yang** is determined, and their **Two Forms (兩儀)** stand revealed. By the transformations of the **Yang**, and union therewith of the **Yin**, water, fire, wood, metal, and earth are produced.



# TàijíTú(太極圖) & Yin-Yang(陰陽)

- ⦿ Dynamics of *Yin* and *Yang* is illustrated by *TàijíTú*(太極圖)
- ⦿ The diagram is a symmetric arrangement of the dark *Yin* and the bright *Yang*
- ⦿ The symmetry is not static but rotational.
- ⦿ The two dots in the diagram symbolize the idea that each time one of the two forces reaches its extreme, it contains in itself already the seed of its opposite.

## 太極圖 (Tài Jí Tú)

Diagram of the Supreme Ultimate



# National Flag of Korea (太極旗)



# *Tao Te Ching* (道德經) : ch. 42

"**Tao** produced Oneness.  
**Oneness** produced duality.  
**Duality** evolved into trinity,  
and **trinity** evolved into the ten thousand things["

**The ten thousand things** support the *yin*  
and embrace the *yang*.  
It is on the blending of  
the breaths of the *yin* and the *yang*  
that their **harmony** depends."

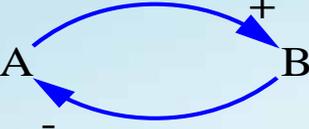
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[ Ten thousand things(萬物) means infinite number of things  
in the China, Korea and Japan.

# Correspondence : Eastern thought to System Dynamics( )

Tao Te Ching (道德經)	Eastern Philosophy	System Dynamics
Tao (道)	Tao (道)	Rule
Oneness (一)	Aether/Fluids (氣)	→
Duality (二)	Yin (陰)	-
	Yang (陽)	+

# Correspondence : Eastern thought to System Dynamics ( )

Tao Te Ching (道德經)	Eastern Philosophy	System Dynamics
Trinity (三)	Yin Aether (陰氣)	
	Yang Aether (陽氣)	
	Harmony Aether (和氣)	

# Correspondence : Eastern thought to System Dynamics ( )

Tao Te Ching  
(道德經)

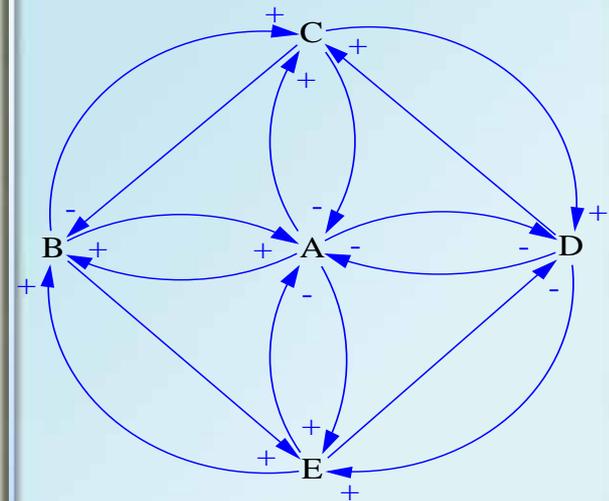
Eastern  
Philosophy

System  
Dynamics

Ten thousand  
things  
(萬物)

All  
things  
(萬物)

**SYSTEM**

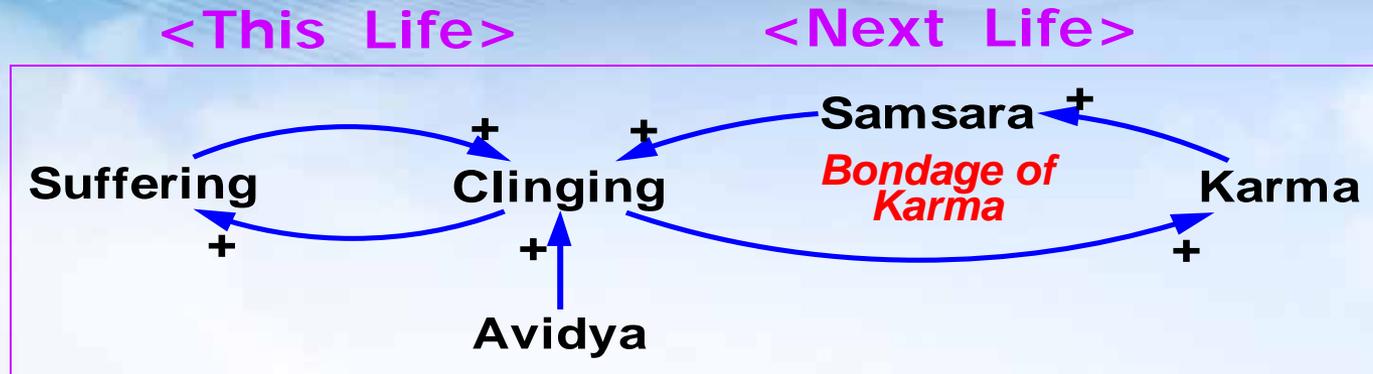


# Central Theme of Buddhism

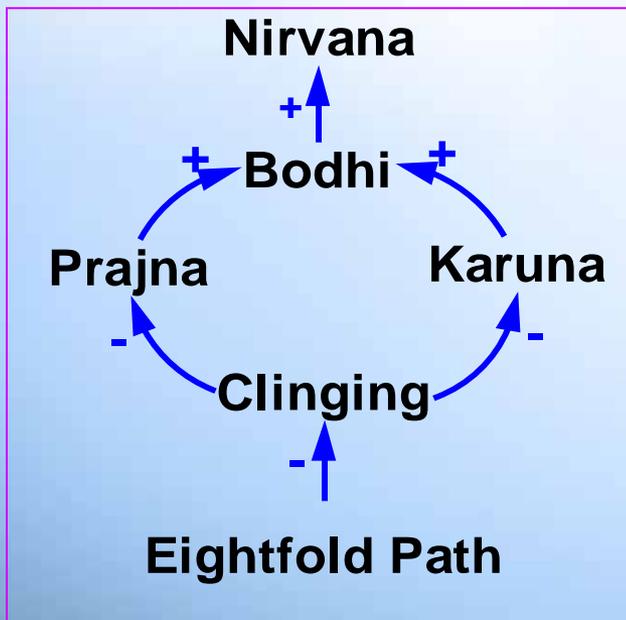
- ☯ **Central theme of the Buddhism**
  - ☯ Unity of all things and events
  - ☯ Interrelation of all things and events
- ☯ **Buddhism stresses on Causality**
  - ☯ All things arise and pass away by causality
- ☯ **Spatial Causality and Temporal Causality**
  - ☯ All things are linked one another by a cosmic web  
[諸法無我]
  - ☯ All things are impermanent and variable vanity  
[諸行無常]
- ☯ **All life is the oneness**
  - ☯ We should have **love and compassion** on all life

# Buddhism

## Vicious Circle vs. Total Liberation



### <Eternal Life>



### <Terms>

- Avidya : Ignorance
- Duhkha : Suffering
- Trishna : Clinging
- Karma** : Never-ending chain of cause and effect
- Samsara : Round of birth-and-death
- Eightfold Path : Buddha's prescription to end all suffering and to lead to state of Buddhahood
- Prajna : Transcendental wisdom
- Karuna : Love or Compassion
- Bodhi : True enlightened wisdom
- Nirvana : A state of total liberation

# Types of Systems Thinking by Criterion ( )

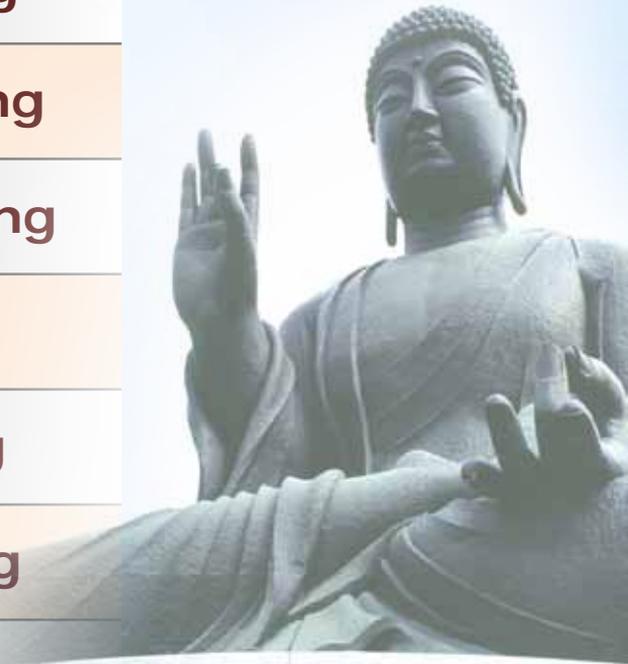
Type 1	Criteria	Type 2
Static Thinking	<i>Time</i> 	Dynamic Thinking
Structural Thinking	<i>Rate of Change</i>	Functional Thinking
Linear Thinking	<i>Direction</i> 	Cyclical Thinking
Open-loop Thinking	<i>Boundary</i> 	Feedback Thinking
Deterministic Thinking	<i>Randomness</i> 	Stochastic Thinking

# Types of Systems Thinking by Criterion ( )

Type 1	Criteria	Type 2
Binary Thinking	<i>Valence</i> $A+B=?$	Fuzzy Thinking
Broken Thinking	<i>Connectivity</i> 	Causal Thinking
Mechanistic Thinking	<i>Vitality</i>	Organic Thinking
Analytic Thinking	<i>View</i> 	Holistic Thinking

# Thinking Types of Buddhism by Criterion

Criteria	Buddhism
<i>Time</i>	Dynamic Thinking
<i>Rate of Change</i>	Functional Thinking
<i>Direction</i>	Cyclical Thinking
<i>Boundary</i>	Feedback Thinking
<i>Randomness</i>	Stochastic Thinking
<i>Valence</i>	Fuzzy Thinking
<i>Connectivity</i>	Causal Thinking
<i>Vitality</i>	Organic Thinking
<i>View</i>	Holistic Thinking



# Chuang-tzŭ (莊子)

夏蟲不可以語於冰者 篤於時也

井蛙不可以語於海者 拘於虛也

曲士不可以語於道者 束於教也

# Chuang-tzŭ (莊子)

夏蟲不可以語於冰者 篤於時也

The **summer insect**  
doesn't understand the **ice**  
because it is bound to **TIME**

# Chuang-tzŭ (莊子)

井蛙不可以語於海者 拘於虛也

The **frog in a well**  
doesn't understand the **sea**  
because it is bound to **SPACE**

# Chuang-tzŭ (莊子)

曲士不可以語於道者 束於教也

The **stupid scholar**  
doesn't understand the **truth**  
because he is bound to  
**PREDECESSOR's dogma**

# Welcome to Seoul, Korea





**Thank you**

