Leaders of the Chinese Economy:
Cognitive and Motivational Analyses

Peter Suedfeld, Lindsy Grunert, and Bradford H. Morrison

The University of British Columbia

Executive Summary

In order to gain a quantified, evidence-based picture of decision-making tendencies of Chinese industrial, technical, economic, and political leaders, the UBC research group assessed the integrative complexity and motivational hierarchy of high-level figures in government and (ostensibly) private enterprise. We selected leaders who have been involved in developing and implementing the global commercial and political strategies of the People's Republic of China. We used thematic content analysis of open-source texts to assess two categories of psychological processes: (1) patterns of cognition that underlie information search and evaluation, flexibility, contextual monitoring and responding, information inclusivity, and perspective-taking bases of planning and strategizing; and (2) the relative strengths of three basic motives that guide those cognitive processes. The measures are related to planning, decision-making, goal-setting, and relations with other individuals and entities, as well as to strategies for coping with stressful conditions. Excerpts from texts by important figures in the Chinese economy were collected and analyzed. The texts concerned Chinese-American economic relations; the sources were leaders of four major sectors of the national economy: high-level political leaders discussing general economic issues, and top executives in the technology, space, and cyberspace areas.

The results showed high Achievement motivation among all four groups of leaders, indicating the desire to excel, progress, and succeed. Power motivation was relatively low among the political leadership, whose concern with influencing and controlling events may have been focused on areas other than the economy (e.g., international relations, domestic unrest). It was quite high among the executives of the other three areas, most notably in the technological sector. The third basic motivation, which is for Affiliation (warm, friendly relations with others), was very low across all groups. Low Affiliation motivation is not unusual among leaders in several areas of life and in many countries.

These results suggest that Chinese elites will respond flexibly to changing events, modifying policies and strategies to fit new circumstances; will maintain a strong competitive drive and act to exert increasing influence over events and other countries (whether friendly or adversarial); and will show little concern about non-pragmatic (i.e., traditional or emotional) relations with others.

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Introduction

In a number of earlier studies, thematic content analysis (TCA) has been used to study leaders and governments from around the world, sometimes tracking their psychological processes through developing events and changing fortunes, and sometimes to get a "snapshot" of those processes at one specific time. TCA is a useful methodology, with flexible and diverse applications. Furthermore, it is scientifically rigorous, minimizing possible research artifacts and biases and producing quantitative data whose reliability and statistical significance can be computed. It can be applied to almost any meaningful verbal text, potentially in any language or from any historical era.

To conduct a TCA study, a detailed scoring manual for the psychological variable of interest is created first. These manuals are often based on well-established psychometric instruments of known validity and reliability, which are converted from interview or questionnaire formats to the assessment of their various components as they appear in running text. Next, experts familiar with the psychological variable being measured are given the draft manuals for modification and correction, to establish the criteria's close equivalence to the original instrument. When a satisfactory level has been reached the draft manual as edited moves to the next step.

Selected passages from various texts, chosen to be diverse in topic, source, length, etc., are then scored using the manual and interscorer reliability is calculated. The goal is to create a final manual that is valid (i.e., can be used to generate scores that indicate the strength of the variable of interest in the selected texts) and reliable (produce closely similar scores across different expert scorers). When that has been achieved, the manual is used to train new scorers who are not already experts in this context. After training, which usually takes several days of intensive workshop discussion followed by independent scoring of sample materials, the new scorers' competence is assessed by having them independently score a standard set of test passages. If their scores match those of the experts who scored the same passages first, they are considered qualified to score for actual research purposes. Otherwise, they are offered further training and another set of test passages.

TCA scoring manuals have been developed for a variety of cognitive, emotional, problem-solving, motivational, interpersonal, and other psychological variables. Among those most frequently used in political psychology have been the measure of integrative complexity (IC) and measures of the appearance in the text of three basic motives (motive imagery, or MI). These are also the measures used in the current study.

Integrative Complexity (IC)

Integrative complexity (IC) is a characteristic of cognition focused on the complexity of information processing related to the structure, not content, of thought (Suedfeld et al., 1992). Used for the purpose of providing at-a-distance insight into an individual's decision-making and information processing, IC measures flexible thinking, responsiveness to changing circumstances or new information, ability to understand other people's perceptions or points of view, tolerance of uncertainty and lack of closure, and the making of nuanced decisions and judgments. It is scored by paragraph, on a 1-7 scale (for more details and examples, see the Methods section and Table 2).

The literature of research using IC is massive. Because the methodology can be applied to almost any kind of meaningful verbal material, from any era, any language, any source, it lends itself to many perspectives and topics. There have been articles using IC as a dependent variable in studies of business management, adjustment to unusual environments, scientific arguments, leadership and followership in small groups, judicial reasoning, etc. Published materials prominently include studies of political leaders and consultant groups, legislators and ordinary voters, and the cognitive process that precedes and accompanies political decisions at all levels. Many of these address IC in the context of prospective or actual conflict: for example, a number of studies have shown that the IC of national leaders and their close associates tends to drop prior to confrontations that lead to war, but not when the dispute is settled peacefully by negotiation (Suedfeld, 1988, 2010).

It should be noted that IC is not considered a personality trait that is exhibited in a stable fashion differing across individuals and time. It varies situation by situation, time by time, issue by issue. For example, the level of IC at which a person thinks at a given time may be decreased by stress, time pressure, informational overload or conflict, high emotional arousal, fatigue, danger, distraction, lack of knowledge about the topic, etc. People differ in their susceptibility to "disruptive stress," with some leaders being more able to maintain high levels of IC even in adverse circumstances – a characteristic that seems to be associated with long-term professional success (Suedfeld, 2014).

Operating at a high IC level does not guarantee optimal, or even sensible, decisions, nor necessarily ethical or moral ones. When a problem calls for creative, flexible, information-based, open-minded thinking, when time and resources are available for such thinking, and the individual is in physical and psychological state to engage in it, higher IC is likely to lead to better decisions. When firm decisions must be made, sometimes in a hurry, with competing demands on the leader's time and energy, clear and simple decisions are often preferable. The specific circumstances are important: for example, during elections or revolutions, leaders of the challenging group often speak at a relatively low level of IC but rise to a higher level if they ascend to power (Suedfeld, 2014). Challengers can limit their texts to criticizing the adversary in direct, adversarial or even insulting terms, whereas incumbents try to justify and explain policies and decisions they have made under complicated circumstances. A victorious challenger then inherits the complexities of high office; his or her success may depend on being able to adapt to this complexity.

Motive Imagery (MI)

Devising new scoring techniques for responses to the ambiguous pictures of the Thematic Apperception Test (Murray, 1943), social and political psychologists focused on the recognition of words and phrases related to one of three seminal motives: the needs for Achievement, Affiliation, and Power (nAch, nAff, nPow: McClelland, 1961).* More recently, a quantified method for scoring all three motives simultaneously has been developed and applied it to scoring political materials (Winter, 1991).

Achievement motivation is demonstrated by texts emphasizing success, personal bests, unique accomplishments, living up to a standard of excellence. Affiliation motivation refers to close, warm relationships: liking or loving another person or group, feeling sympathy, sharing their emotions, and nurturing them. Power motivation is the need to influence, convince, persuade, or compel another person or group to follow one's will, or to otherwise strongly impact other persons. It can be as gentle as offering unsolicited advice, or as brutal as threats of dire punishment for disobedience.

* These are capitalized in the text when the reference is explicitly to the three motives scored as MI.

Power motivation is usually expressed as obtaining a goal that the source values. That goal may be tied into Achievement motivation (e.g., urging workers to greater effort) or Affiliation motivation (e.g., keeping one's child from running across a street), or both (e.g., a coach advising a favorite player on how changing his batting stance might improve his performance).

Achievement motivation, the first focus of early MI research, was found to be associated with economic progress (McClelland, 1961). For example, increases in mentions of achievement-related themes in primers, children's books, songs, etc., preceded major economic advances when those children reached adulthood. High-level business executives were found to score high on measures of need for achievement. Eventually, a number of alternative measurement techniques were developed, including the analysis of graphic, artistic and artisanal creations. Although no such methodological versatility has been demonstrated with regard to the other two major motives, the applications of MI scoring and the resultant findings have been quite diverse. For example, we have found a frequent negative correlation between IC and Power motivation, such that the outbreak of intergroup violence is preceded and/or accompanied by decreases in IC and increases in Power references (e.g., Stewart & Suedfeld, 2012).

Each basic motive may function positively or negatively, depending on circumstances. Economic policies may lead to increases in industrial productivity but devastate the national agriculture, as in the early years of the USSR; foreign aid may lead to resentment, as also may the lack of it. Military power may be exerted to subjugate a peaceful neighbor, or to replace a genocidal dictatorship; its lack may lead to disaster in the face of better-armed adversaries.

The current study

The study reported here uses TCA to examine the IC and MI of some high-level leaders of the Chinese economy. With the growing involvement of the People's Republic of China in the global international community, and its decades of increasing economic, political, and military strength, the psychological structure and functioning of its leadership has become the topic of investigation on the part of many social scientists. One of our previous studies (Suedfeld & Morrison, 2016) applied TCA to the speeches and writings of 14 individuals who held high-level positions in various aspects of Chinese society. The subjects included top leaders in the national government and the Communist Party and/or the People's Liberation Army, and several individuals just below the top ranks who were identified by China experts as potential candidates for moving up in the hierarchy.

In response to an invitation from SMA, the current study was designed to expand the scope of the previous examination of Chinese leaders. The number, and especially the range of official positions, of the leaders have been increased. At the same time, the topic has become more focused. In the previous research, IC and MI were tracked through texts addressing many topics and through a wide range of events, with both domestic and international relevance. In the present work, texts were selected that dealt with the specific domain of each individual's career and position. The exception was the category of the general economy: there, two top-level leaders of the party and government (Xi Jinping and Li Keqiang) were the sources, but only their statements concerning the economy were selected and scored. Since the economy is only part of their individual portfolios, we expected that their utterances on that topic would differ from those coming from leaders whose expertise and career were concentrated in a specific sector of the economy. The four sectors we identified are shown in Figure 1.

Figure 1. Four Chinese Economy Sectors of Interest to the US

Method

The present study commenced with a collection of open source verbal material, from executive leadership in China, pertaining specifically to each category of focus: the economy, space, technology and cyberspace (see Table 1). The corpus of verbal material included speeches, written articles, interviews and policy papers authored by each of the leaders, found either in English or translated from Chinese sources. Previous studies have confirmed that texts as translated by experts (e.g., official UN and government translators) reach IC levels that are compatible with the same material scored in the original language (Suedfeld, et al., 1992, p. 399).

Research assistants were issued stringent guidelines for collection. These guidelines included specifications, such as a date range of January 1st, 2014 to December 31st, 2018, the full names and positions of individuals for each category of interest, and a list of potentially useful sources for each sector, such as official government sites or reputable media outlets. Potential topics one might encounter for each sector -- such as launches and missions for the Space sector, and cyber warfare and cyber treaties for the Cyberspace sector -- were also included in the collection guidelines.

Table 1. Leaders Scored in the Study.

Sector	**Position**	**Leader's Name**
Economy (General)	President	Xi Jinping
	Premier	Li Keqiang
Space	Secretary General of CNSA	Li Guoping
	Director of China's National Space Administration (CNSA)	Xu Dazhe

	Director of China's National Space Administration (CNSA)	Zhang Kejian
	Deputy Director of CNSA	Wu Yanhua
	State Council Information Office, PRC	NA – published by office
Technology - Huawei	Huawei Founder	Ren Zhengfei
	Huawei Chairman of Board of Directors	Liang (Howard) Hua
	Huawei Deputy Chairman, Rotating CEO	Xu Zhijun (Eric Xu)
Technology - ZTE	ZTE Founder	Hou Weigui
	ZTE Chairman and President	Zhao Xianming
	ZTE President	Shi Lirong
	ZTE Chairman	Yin Yimin
Cyberspace	Director of Cyberspace Administration of China	Lu Wei
	Director of Cyberspace Administration of China	Xu Lin
	Director of Cyberspace Administration of China	Zhuang Rongwen

The search began with a narrow focus on the relevant Chinese leaders' discussions about their organizations' competitive, cooperative or conflictual interactions directly with the United States or United States representatives regarding their sectors' topic only. When these initial searches turned up insufficient material, the search was widened to include interactions between the Chinese sector representatives and organizations of which the US is a member (excluding international organizations or events like BRICS, ASEAN, China-EU business summit etc.). The search was then further widened to include instances where Chinese leadership spoke of interactions with the entire world or humankind as a whole. All final paragraphs were reviewed by a research assistant to ensure that the guidelines were followed and any paragraphs not adhering to these guidelines were removed from the corpus. The remaining paragraphs were divided into four groups of 100 paragraphs per sector (including 50 from each political leader in the Economy sector and 50 from each company in the Technology sector), randomly sampled and scored using two Thematic Content Analysis (TCA) methods: integrative complexity (IC) and motive imagery (MI).

Integrative Complexity (IC)

IC scoring is done by qualified scorers, defined as those who have completed the training process described in the Introduction and have obtained a correlation of 0.80 or higher between their scores and those of a group of expert scorers. All texts are scored by at least two qualified scorers to assess reliability.

The unit used for scoring IC is the paragraph. In the present study, scorable paragraphs were defined as those containing more than one sentence and no more than three hundred words. Before scoring, paragraphs were stripped of individual identifying information and randomized by sector to limit any potential scorer bias before being compiled into packages for distribution. As a further precaution, scorers were not told sector information before being assigned packages.

IC is scored on a scale of 1-7 (low to high), representing various degrees of differentiation and integration. A score of 1 is assigned when a text indicates that the source perceives only one legitimate opinion about a topic, accepts only one correct judgment or viewpoint about it, and explicitly or implicitly judges all alternatives to be wrong, unsuccessful, or evil. A score of 3 indicates the presence of

differentiation, the source's recognition that a topic or situation has several characteristics or dimensions, that there may be different legitimate opinions or ways of perceiving it, and that different approaches may be appropriate for dealing with it. The score of 5 identifies evidence for *integration*, the recognition that different legitimate dimensions or perspectives may interact, be linked, or be combined. The highest level, a score of 7, indicates that the integrated components themselves fit into a superordinate "integration of integrations," in which they are described as part of an overarching pattern such as a natural law, or a philosophical or religious system. Scores of 2, 4, and 6 are transitional, meaning that the text shows some evidence of the next higher score, but not clearly enough to reach that level (Baker-Brown et al., 1992).

Table 2. Examples of IC Scoring.

1	The company takes the US ban seriously and has immediately set up a crisis team, with every division analysing and coming up with measures to deal with the crisis. We need the combined strength of [TELECOM COMPANY]'s 80,000-strong staff in this tough time. I would like to appeal to all employees to maintain a state of calm, to man one's post and do one's job well. The company is actively communicating and giving its all to resolve this crisis.
3	Space resources can serve national security and the economy, and therefore we integrate military and civil development into our strategy. We use space resources for preserving world peace and safeguarding China's national defense; this is an understandable pursuit. I think, on this subject, China is more and more open. I hope our friends in the United States will notice this so that we may cooperate with our American colleagues in developing astronautic technologies.
5	The development of China's Internet over the past 20 years resulted in mutual benefit, a win-win situation and integration with the United States. Between China and the U.S. Internet industry, there are differences in terms of market volume, operational mechanisms, technology and training. These differences should not be obstacles. It is precisely through these differences that we can complement each other and create all kinds of possibilities for cooperation and mutual benefits.

7	China is in a state where we must rely on the transformation and upgrading of the economy in order to sustain healthy development, so it is very important to coordinate in pushing forward stabilizing growth, restructuring, and promoting reform. Stabilizing growth can create effective space and conditions for restructuring, while restructuring can boost economic development, so the two are mutually complementary. Breaking through institutional barriers through reform can add new impetus to stabilizing growth and restructuring. Macro control must base itself on the present and set its sights on the future so as to make sure that the economy run within a reasonable range, and that the economic growth rate and employment level do not fall below the "lower limit" while price rises and others do not exceed the "upper limit." Within that reasonable range, we must focus on restructuring, promoting reform, and pushing forward the transformation and upgrading of the economy. In coordination, we must form a reasonable policy framework for macro control, and organically integrate restructuring and promoting reform with stabilizing growth, ensuring employment, or the policies of keeping inflation under control and preventing risks. The measures we take must serve multiple purposes, namely being able to achieve both stabilizing growth and restructuring with sights on both the present and the future so as to avoid drastic ups and downs in the economy. [1]

Motive Imagery (MI)

Another TCA method used in this study is Winter's (1991) method for scoring motive imagery (MI). This method of scoring verbal material at a distance focuses on goals and goal-directed actions in the form of three important human motives: achievement, affiliation-intimacy, and power. *Achievement* imagery is marked by a concern with performance excellence, competitive behavior emphasizing quality, and unique accomplishments. *Affiliation* imagery reflects warmth in interactions with others, companionate activities, and a concern with maintaining, or sadness at disrupting, relationships. *Power* imagery is evident in forceful or impactful behavior toward others, attempts at influence or control, and concerns about prestige (Winter, 1991).

As with IC, for MI we sample paragraphs, and assign these paragraphs to scorers. However, unlike IC, MI is scored as a count of how many times each category of motivation occurs within a paragraph. So, for instance, if the speaker mentions the desire to perform excellently in three separate clauses of a paragraph, then that paragraph would be given an Achievement motivation score of 3. In order to prevent the length of paragraphs from affecting the reported values, the counts are converted to the frequency with which each motivation appears per 1,000 words. This frequency per 1,000 words is what we report for the MI variables.

Table 3: Examples of MI Scoring.

[1] Since there were no scores of 7 assigned in the present study, an example was used from UBC's previous contribution to the SMA effort *Drivers of Conflict and Convergence in the Asia-Pacific Region in the Next 5-25 Years*, p. 57.

nAch	We need to keep challenging ourselves and aim for excellence as we look ahead, because we need to surpass our competitors, and not merely follow in others' footsteps.
nAff	First of all, let me thank you for calling me recently to express sympathy over the missing Malaysia Airlines flight and for instructing relevant U.S. agencies to join the search for the missing plane, and for sharing information with the Chinese side.
nPow	In order to widely popularize space knowledge, promote space spirit, spread space culture, and encourage the whole society to actively participate in and support space science education, the National Space Administration will establish a space science education base nationwide in 2017.

Results

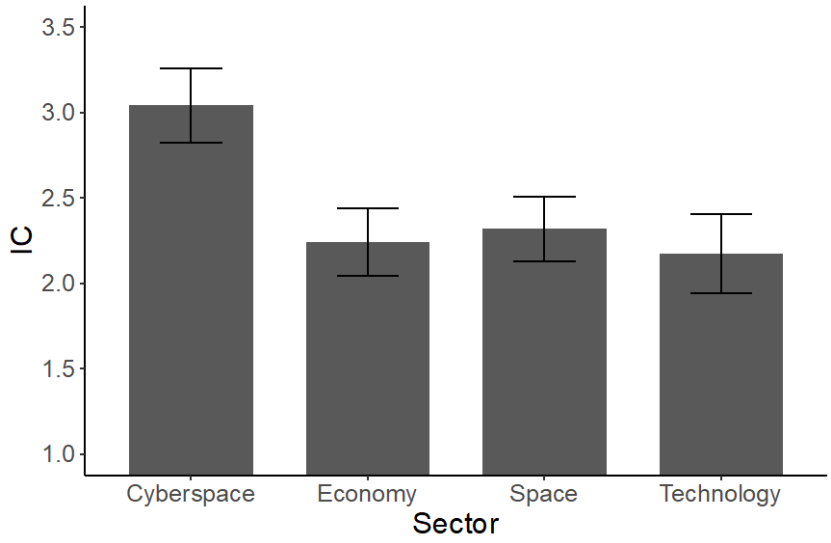
Table 4. Mean IC and MI scores for all sectors.

	Complexity	Achievement	Affiliation	Power
General Economy	2.24	7.27	1.16	1.26
Space	2.32	8.57	0.11	3.32
Technology	2.17	7.72	1.40	5.14
Cyberspace	3.04	5.70	1.12	2.24

In our statistical analyses, for each variable we first did a one-way analysis of variance (ANOVA) across the sectors. If the results were significant, we next did a Tukey HSD analysis to identify which specific pairs of sectors were significantly different. Summarized, the ANOVAs show statistically significant differences across sectors, for Integrative Complexity [$F(3,384) = 14.22$, $p<.001$] and Power motivation [$F(3,394) = 7.56$, $p<.001$] and an almost significant difference for Affiliation motivation [$F(3,394) = .2.47$, $p=.06$). Achievement motivation did not differ significantly across the sectors [$F(3,394) = 1.32$, NS].

Qualitative and internal (Tukey HSD) analyses show the following differences within the overall ANOVAs.

Figure 2. Cross-sector differences in IC and MI (the whiskers indicate 95% confidence intervals).



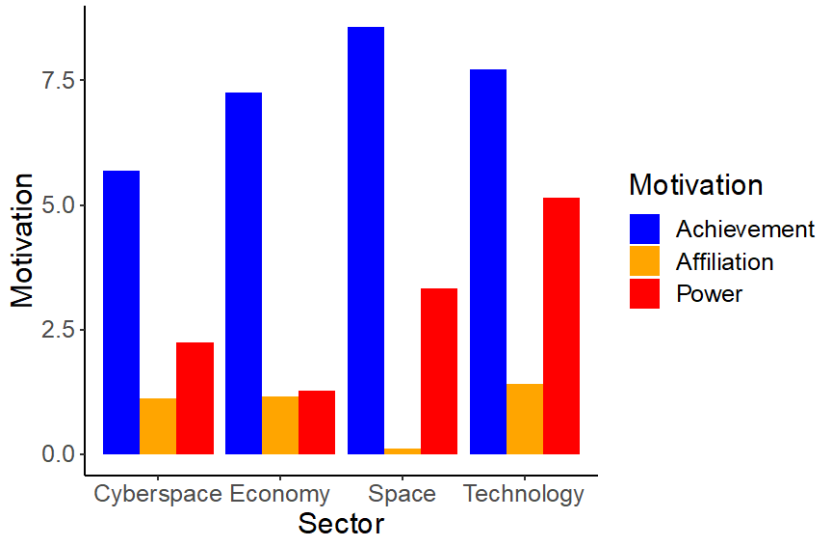
Integrative Complexity (IC)

The complexity level of leaders of all sectors are in the range of transitional (in the case of the Cyberspace group, clear) differentiation. These levels are within the norms for leading national government officials and military officers. Scores of the Cyberspace sector are significantly higher than each of the other three (all $p<.001$), and somewhat higher than the usual range for international counterparts.

The leadership of the four sectors exhibited relatively high integrative complexity (mean = 2.44). This relatively high integrative complexity indicates a tendency to take into account more information, strategic flexibility, and some recognition of alternative perspectives.

This mean integrative complexity of 2.44 is higher than the integrative complexity that we found for Chinese civilian leaders (mean = 2.02) in a previous study (Suedfeld & Morrison, 2015). This difference is largely driven by the high integrative complexity in the cyberspace and space sectors. In this current study, the integrative complexity of the general economic sector (mean = 2.24), which sampled only from the leaders Xi Jinping and Li Keqiang, is very close to the previous study's finding of the integrative complexity of Xi Jinping (mean = 2.10) and Li Keqiang (mean = 2.21) (Suedfeld & Morrison, 2015). So, the findings in this study are consistent with the previous study, and suggest that Xi and Li think about economic issues at roughly the same level of complexity as they do in general.

Figure 3. Motive Imagery



Motive Imagery (MI)

The leadership of each of the four sectors exhibited the same hierarchy of motivations, in which the motivations ranked from highest to lowest were Achievement (mean = 7.32), Power (mean = 2.99), and Affiliation (mean = 0.95). This is the same order of ranking that we found, in a previous study, was most common among Chinese political leaders (Suedfeld & Morrison, 2015), so this appears to be the most common hierarchy of motivations among economic and political elites in China.

It is common among political leaders for Affiliation motivation to rank lowest (Suedfeld & Morrison, 2016, 2019; Suedfeld, Morrison, & Cross, 2014), so this should not be interpreted to mean that the Chinese leaders in this study are unusually uncooperative. They, like most political elites, are not motivationally oriented towards warmth, love, and nurturance, but this does not preclude co-operation. For instance, their high Achievement motivation is consistent with co-operation, if that co-operation helps them to achieve success, such as rapid economic growth.

Achievement Motivation: No statistically significant differences were found across sectors. It is worth noting that this was by far the highest-ranked motive for every sector, with a particularly high score among Space leaders.

Affiliation Motivation: The Space sector was unusually low in Affiliation compared to the others, although all four showed it as their lowest-ranked motive. The difference between Technology and Space was close to significant by the Tukey test, p=.08, although the Technology average was only slightly above the other two. Affiliation is typically the lowest of the three motives in studies of both individual political and governmental leaders and leadership groups.

The particularly low Affiliation motivation of the Space sector is counter-intuitive, given that Space research and exploration are often seen as shared undertakings that encourage a sense of common humanity. A possible explanation is that the Chinese government has historically been dependent on the United States and the USSR/Russia for access to human spaceflight. More recently, it has been starting to develop the capacity to go it alone, and to demonstrate to the world that it can do so. It may therefore currently lack the motivation to use the Space sector to build friendly relations with other states.

Power Motivation: (a) The General Economy group was unusually low in Power motivation, considering it is composed of the top-ranking political leaders Xi Jinping and Li Keqiang. We elaborate on this in the discussion of the leadership of the General Economy, below.

(b) Relative to the General Economy group, we found high Power motivation among the specific economic sectors, particularly the Technology sector. The Technology sector was significantly higher than the General Economy group (p<.001 by Tukey's test) and Cyberspace (p<.03). An explanation is that, unlike the General Economy group (Xi Jinping and Li Keqiang), the leaders of the technology companies Huawei and ZTE *do* feel that the United States poses a threat to their power and control.

The Space sector was close to significantly higher in Power motivation than the General Economy group (p=.08). This may be for the same reason as the low Affiliation motivation in the Space sector – the Chinese government is currently using the Space sector to project national independence, power, and prestige.

Discussion

A Closer Look at the Leadership of the General Economy

The paragraphs that we sampled on the topic of the General Economy were from two top-level leaders: President Xi Jinping and Premier Li Keqiang. As such, the results discussed here reflect the cognitive structure and motivations of President Xi and Premier Li, when they are discussing the Chinese economy and how it relates to the United States and other foreign actors.

The General Economy group was unusually low in Power motivation, considering it is composed of the top-ranking political leaders Xi Jinping and Li Keqiang. In previous studies, top-ranking political leaders tended to be high on this motive, although the Chinese political leadership is generally quite high in Achievement motivation as well (Suedfeld & Morrison, 2016). In the 2016 study, we concluded that the PRC leadership emphasized Power when events seemed to jeopardize internal tranquility or the supremacy of the Communist Party. There was no analysis by domain in that research (i.e., expressions of Power in the economic versus political realms). But it is possible that the current low scores, obtained from texts focusing exclusively on the economy and in a relatively short time span, reflect the leadership's concentration at that time on controlling domestic unrest or dissent. Along the same line of reasoning, it may be that the two top political leaders do not consider the United States to be an economic threat to the domestic supremacy of the Communist Party.

Whether this pattern will change if the Chinese economy falters in the face of American tariffs and sanctions. The impact of these goes beyond a slowdown in exports and imports, with what these mean for the industrial sector. For example, both consumer sales and tourism are far below expectations and below the standing of the recent past (Xin & Tang, 2019). In the same time frame, political protests in Hong Kong, which began in March 2019, have grown larger, more (on the part of both the protesters and the government), creating the worst crisis since Hong Kong was returned to Chinese control in 1997 (Master & Pomfret, 2019). The Hong Kong stock market has lost $500 billion in value since the demonstrations started, China's international trade usually conducted through Hong Kong has dropped, and the reputation of Hong Kong as having a stable business climate has suffered.

The protests have not only interfered with the economy and domestic tranquility but have also posed a conundrum for the central government. If the protests continue, the stability of the political and social system may be seen by conservative Chinese as well as by rebellious youth as endangered by a weak government; on the other hand, a deadly crackdown à la Tiananmen Square would be a disaster for

China's standing in world diplomatic and public opinion, possibly leading to even more stringent trade barriers (Kelly, 2019).

Based on our findings in the 2016 study, we expect a rise in Power motivation if the sanctions, economic slowdown, and protests -- and their negative consequences for the Chinese leadership -- continue or even accelerate. If, as is currently the case, these events reach the level of destabilizing the leadership of the Communist Party, the need to exert whatever power is necessary to rectify the situation may well result in a drop in the cognitive complexity of decision-making and problem-solving, a concomitant drop in focusing on Achievement rather than Power, and a crackdown that could not only restore peace and quiet but also lead to major changes in Chinese policy.

A Closer Look at the Technology Sector

The executives of the two technology companies, Huawei and ZTE, exhibited Achievement motivation that was both high, and that ranked highest of the three motivations (see Table 5). This is not surprising, given that this is the common pattern of the Chinese leaders, and given that these companies are Chinese national champions and international business successes that have expanded very rapidly.

We found one unexpected difference between the leaders of the two companies in the Technology group. Achievement motivation was significantly higher for the ZTE leadership group than for Huawei, $F(1,98)=3.79$, $p=.05$. Otherwise, the scores of the executives in the two companies were remarkably similar.

Table 5. IC and MI data for Technology Sector Organizations

Organization and leaders	Position	IC	Achievement	Affiliation	Power
Huawei (Ren Zhengfel, Xu Zhijun, Liang Hua)	Founder and top executives	2.22	5.99	1.61	5.29
ZTE (Hou Weigui, Shi Lirong, Zhao Xianming, Yin Yimin)	Chairman and top executives	2.12	9.51	1.19	4.99

This difference in Achievement motivation may explain differences in the behaviors (and outcomes) of the two groups of executives. The leaders of Huawei exhibit relatively balanced Achievement and Power motivation, while the leaders of ZTE exhibit Achievement motivation that far surpasses Power.

Background

Both companies have faced penalties for violating international, and specifically American, rules of commerce. ZTE claimed to have complied with penalties imposed in 2017 for having illegally traded with Iran and North Korea. The company was fined an enormous US $1.19 billion and was required to fire several top executives (statement of US Commerce Secretary Wilbur Ross, March 7, 2017). In 2018, ZTE was found to have lied about having complied with these demands. As a result, its profits dropped by more than a billion US dollars (Shi, 2019) The chairman, Yin Yimin, described the situation as a crisis, and exhorted ZTE's employees in a classic Achievement-oriented message, including the following:

"We need the combined strength of ZTE's 80,000-strong staff in this tough time. I would like to appeal to all employees to maintain a state of calm, to man one's post and do one's job well. The company is actively communicating and giving its all to resolve this crisis" (Quoted in Tao & Yang, 2018).

After a re-imposed trading ban with the US, the replacement of ZTE's top management (including Chairman Yimin himself), the imposition of additional fines, and the creation of an internal oversight committee, the penalties were lifted. These interactions established that the company could not successfully play a power game against the United States, and reinforced the existing emphasis on Achievement motivation in its corporate *Zeitgeist*. The prolonged argument over the penalties, and the demonstration of US power over even individual executives, could have led to the recognition that external forces – namely, the United States – could severely limit the company's actions and its future. This may have motivated management to avoid further power struggles and instead to try to regain the high standing, competitive edge, and profitability of the company through better economic and technical performance. Recent financial statements indicate that this is happening (Shi, 2019); thus, achievement-oriented efforts may be succeeding. Positive reinforcement of this sort is likely to lead to a maintenance or even increase of achievement as the dominant motivating force of the organization.

Huawei is a much larger corporation than ZTE, with close ties to the CCP and, reputedly, the PLA, and with a considerably greater presence and impact in the global economy. Although it, too, suffered sanctions from the US, the impact was not as devastating as for ZTE. In the first half of 2019, Huawei posted a 23% increase in revenues over the previous year. Its founder, Ren Zhengfei, has repeatedly referred to the company's ability to survive sanctions, maintain good relations with individual American businesses, and continue without serious damage its trading with other Western entities. For instance, he has said that:

"Our 5G base stations, our customers in Europe can reduce their engineering costs by 10,000 euros per site…. Europe will not follow in the footsteps of the US, and the majority of US companies are communicating closely with us" (Quoted in Interview with Chinese Media, 2019).

As a very large, global company, with a powerful government close behind it, Huawei has been more confrontational with the US and the West than has ZTE. Where ZTE tried to maneuver around problems with American trade, Huawei's leaders consider the company's (and their) status to be secure, and speak accordingly. Here is an excerpt from Ren Zhengfei's recent interview with Bloomberg News (May 31, 2019): "The U.S. has never bought products from us, so how can they negotiate with us? Even if the U.S. wants to buy our products in the future, I may not sell to them. There's no need for a negotiation." Elsewhere in the interview, the interviewer refers to the suspicion that Huawei engages in industrial espionage in the West. Ren's response is that Huawei's technology is so advanced that the West is more likely to steal secrets from his company than *vice versa*. These statements are consistent with a motivational profile that is relatively balanced between achievement and power – rather than one dominated by achievement as was the case with ZTE.

Implications for Future Behavior and Outcomes

Previous research has found that the outcomes associated with high Achievement and low Power motivation depend on the extent to which the person's ability to exert control is subject to checks and balances (Winter, 2010). If the person's control is subject to few checks and balances, as is often the case for private entrepreneurs in America, then high Achievement and low Power motivation is associated with success. However, if their control is subject to a great deal of checks and balances, as is the case for politicians in America, then high Achievement and low Power motivation is associated

with frustration. The reasoning that Winter gives is that, with respect to Achievement motivation, checks to one's control are frustrating obstacles preventing the execution of one's vision, but with respect to Power motivation, checks to one's control are motivating opportunities to exert social influence. As a result, people who are high in Achievement motivation excel when there are few checks to the execution of their vision, but become frustrated in the presence of these checks. Conversely, people who are high in both Achievement and Power motivation are more likely to excel in the presence of checks to their control.

Internally, ZTE and Huawei likely both face few domestic checks and balances. The Communist Party can clear the path for their success. This is consistent with ZTE's corporate success, even given its preponderance of Achievement motivation. More broadly, this is consistent with the finding that Achievement is highest in the motivational hierarchy for the leadership of the Chinese Communist Party, and of the leadership of the cyberspace, space, and technology sectors. There are few checks to the control of the party, and people high in Achievement motivation can succeed and rise through the ranks as a reward for service to the party.

The United States presents a non-domestic check to the Huawei and ZTE. The executives of Huawei, given their balanced Achievement and Power motivation, are likely to attempt to exert control, or at least to influence, the United States in order to achieve corporate success. On the other hand, the executives of ZTE are especially motivated by Achievement. As such, they would be more likely to either become frustrated and disengage with the United States, or to accede to its demands in order to regain access to American markets, in the interest of achieving further corporate success. In other words, Huawei is more likely to butt heads with the American government, or to lobby the American government, while ZTE is more likely to disengage from political interaction, in order to focus on technological and market success. One approach is not inherently more ethical than the other – focusing on market success could include corporate espionage, or other forms of cheating.

In order to appease the United States government, ZTE replaced its high-level management. This is consistent with ZTE choosing to accede to the demands of the United States government, rather than to attempt to attempt to influence it. It is also consistent with the executives of ZTE choosing to step down to serve the best interests of the company, rather than engaging in an internal power struggle. If the corporate culture of especially high Achievement motivation continues under the new management, then we should expect ZTE follow one of two courses. They could accede to the demands of the American government, and to focus on technological and market success, perhaps including through corporate espionage and other forms of cheating. Or, they could become frustrated, and quit the American market.

Unlike ZTE, Huawei only replaced a few of its high-level executives in response to pressure from the US government. As described in the previous section, it has also shown more signs of seeing its interactions with the US government as a confrontation in which each party seeks to influence the other. When questioned recently about the potential to discuss issues such as the detention of his daughter, Meng Wan Zhou and a US government export ban on Huawei, Ren Zhengfei retorted, "I don't have private access to them. Can anyone give me Trump's phone number?" (Huawei, 2019). This kind of response about the prospect of negotiations with the US government, coupled with the filing of a civil lawsuit against the United States's ban in June, 2019, certainly does not project an image of cooperation or compliance. With the addition of a further 46 non-US affiliates of Huawei added to the United States Department of Commerce Entity List at the end of August, it seems the US government has responded in kind (Nikakhtar, 2019).

Which approach is more successful in the US market would depend, to a large extent, on two questions. The first is whether attempts to influence the US government work. If they do not work, then the second question is whether the US government denies the companies access to the US market. If the answer to both questions is "no," then ZTE's approach should be more successful – its Achievement motivation would orient it towards technological improvement and market growth. If attempts to influence the US government work, then Huawei's approach should be more successful – its balanced Achievement-Power motivation would orient it towards influencing the US government to enact policies that enable Huawei to be competitive. If the US government denies both companies access to the US market, then of course neither would be successful in that market.

A Closer Look at the Space Sector

The Space sector's Affiliation motivation was close to being significantly lower than the Technology group's (p=.08). Its Power motivation was close to being significantly higher than the General Economy group's (p=.08). The Space sector's low Affiliation and higher Power motivation may be for the same reason: the Chinese government is currently using the Space sector to project national independence, power, and prestige. The drive is for a free-standing, all-Chinese enterprise. China stands aloof from the International Space Station operated by five space agencies (the American, Russian, European, Canadian, and Japanese). Instead, China sponsors its own station, the Tiangong series, the third of which is scheduled to launch in 2020. Similarly, the Chinese mission to the far side of the Moon, and its plans for a manned landing within ten years, were independent of the other spacefaring nations or the current plans for a human return to the Moon's surface by 2024. Some observers have interpreted this pattern as a new space race, in which the Chinese government hopes to outdo the United States (Davenport, 2019).

This situation fits well with the very high Achievement score of the leaders of the Space sector. China is going ahead with a strong research program to support its space program, a strong program of scientific exchanges, space-oriented conferences and publications, and six space-oriented universities among its assets. A drive for excellence, new accomplishments, and success are all in harmony with the high scores in Achievement.

The Space sector is unlikely to be an area in which the US government can successfully promote mutually beneficial co-operation with China. This is with the qualification that co-operation that promotes China's technological advancement, or that enables it to project national power and prestige, would appeal to the Achievement and Power motivation of the leaders of their Space sector. Unfortunately, co-operation in Space that meets these criteria is unlikely to promote US interests.

A Closer Look at the Cyber Sector

This sector shows the highest Integrative Complexity, coupled with low-moderate scores on the three motivational measures. The IC result is evidence of the kind of thinking that creating new cyber technology: flexible, comfortable with – and enjoying -- new ideas, oriented toward novelty and open-ended information search and utilization. It may also indicate the kind of thinking that could design ways for surreptitiously obtaining new cyber hardware and software developed elsewhere and then modifying it to obscure the original source. The fact that Achievement motivation is low in comparison to the other sectors is surprising, given the cutting-edge nature of the field. It may also imply something about the originality and creativity of how the Chinese cyber sector generates as opposed to how it acquires new tools. Comparing the scores with those of cyber enterprise leaders in other nations would be an interesting enterprise.

One explanation for the above patterns is that many of the sampled texts are about the political or bureaucratic management of cyberspace, especially with respect to control of the flow of information, rather than about the development of new technologies. In particular, the speakers emphasize that they seek to strike a balance between, on the one hand, enabling access to information, and on the other hand, national security, and the ability of the state to do propaganda and "public opinion work." They also emphasize that each state should have the right to independently decide how to strike this balance, and to independently exercise sovereignty in this area.

This is cognitively complex thinking, in that it recognizes more than one legitimate dimension, and attempts to strike a balance between them. There is recognition of different legitimate perspectives on how to strike this balance (Lu, 2019). These texts approach the Cyber sector from quite a bureaucratic perspective, rather than focusing primarily on technological development, which may explain why scores for the three motivations are generally low.

The Cyber sector is an area in which the Chinese government is likely to agree to engage in mutually beneficial cooperation with the US government. The Chinese government does recognize that the United States can legitimately take a different perspective from China on how to manage the flow of information in cyberspace (Lu, 2015). In the Cyber sector the Chinese government is also not particularly motivated by Achievement, and even less so by Power, so it is likely to be willing to agree to eschew, or reduce, attempts to control or influence the United States in this domain.

However, there is an important qualification with respect to the prospect of mutually beneficial cooperation in the Cyber sector. The Chinese government considers itself to have the right to regulate the flow of information in cyberspace within China, so much so that it conceives of censorship, propaganda, and "public opinion work" in cyberspace as a routine bureaucratic task (Zhuang, 2018). It is extremely unlikely that the Chinese government would agree to co-operation that would undermine its ability to censor or direct domestic Internet operations. This attitude limits mutually beneficial cooperation to areas such as combating cyberattacks, cybercrime, terrorist networks, and to protecting minors; and perhaps to developing technology and improving infrastructure.

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