Individualism–collectivism and the quantity versus quality dimensions of individual and group creative performance

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ABSTRACT

Using experiments, this research examines the effects of individualism–collectivism (I–C) on creative performance in solitary and group brainstorming contexts. Affirming the individualistic and collectivistic character of the Canadian and Taiwanese samples, the quantity of ideas generated was substantially higher for Canadians whereas the quality (originality) of ideas generated was higher for Taiwanese, within both independent/interdependent contexts. Canadians were more confident in their creative abilities (in both solitary/group settings), and had a greater propensity to voice disagreement (both quantity/intensity of negative verbalizations uttered) within group contexts.

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1. Introduction

Increased competition has propelled companies to source managerial and technological knowhow globally. As cross-border business activities continue to intensify, and as workforces become increasingly diverse, understanding culture's impact on group performance is crucial to the conduct of multinational firms. Research into these issues is especially pertinent, with the rise of Asian-based multinational juggernauts, and as the globe's economic center of gravity shifts towards East Asia. In 2002, China supplanted the USA as the largest recipient of foreign direct investment, and in 2009, China superseded Germany as the world's biggest exporter (The Economist, 2010). Beyond its attraction as a manufacturing base, China is an important R&D center for many Western firms (e.g., *Microsoft Research Asia*, *Siemens Mobile*); demonstrating that firms are decentralizing creative management tasks, particularly within the high-technology sectors.

Perhaps the biggest obstacle for foreign firms seeking to benefit from establishing operations in Asia is the profound cultural gap between Western and Eastern societies. Many studies examine how cultural values shape thoughts, emotions, and behaviors (Chen, Chen, & Meindl, 1998; Markus & Kitayama, 1991). None has received more attention than what Triandis (1995) calls the most prominent facet of cultural variation, individualism–collectivism (hereafter, *I–C*). Western and Asian cultures are primarily distinguishable by their individualistic and collectivist orientations, respectively. This study seeks a greater understanding of how I–C influences creative performance. A long-held stereotype is that whereas Asians excel in the logical/scientific domains, they are weaker in the abstract domains requiring creativity. For example, some have portrayed the Japanese as copyists and adaptors rather than truly original thinkers (Torrance & Sato, 1979), and Japanese companies as focusing on incremental improvements rather than on radical innovations (The Economist, 2007). Others assert that Asians are no less—and perhaps more—creative than their Western counterparts (Erez, 1992). Regarding the interdependent character of Asian societies, Pye (1985) argues that individuals "…who are secure in their immediate settings, and who have supportive superiors, can be boldly aggressive and creative in their risk taking" (p. 335).

Despite voluminous I–C research, there is a scarcity of investigations into how I–C impacts creative task performance. Concerning the few existing studies, the task nature or character of the contrast groups limits generalizability of the findings. Niu and Sternberg (2001) assess I–C influences on creativity, from the perspective of subjective judgments on the creativity of artworks produced by American/Chinese students. Jung and Avolio (1999) study I–C under the contexts of leadership and individual vs. group task performance, however their contrast of Asian/Caucasian students living in the United States compromises generalizability. Goncalo and Staw (2006) examine the IC's role on group creativity;

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however all subjects are American, and assigned to conditions whereby I–C salience was manipulated via priming. The latter study also does not vary the task environment—i.e., contrasting I–C across individual vs. group problem solving. The paucity of group (vs. individual) creativity research (Nemeth, Personnaz, Personnaz, & Goncalo, 2004) is curious, since firms rely heavily on groups for problem-solving.

This study considers quantitative and qualitative indicators of spontaneous creative performance, comparing collectivist Taiwanese and individualist Canadians. Are individualists and collectivists equally more productive and creative within independent vs. interdependent problem-solving settings, or vice-versa? Insights into how culture impacts decision-making is valuable for firms' internal/external conduct. Companies can harness this knowledge to foster cooperation among culturally-diverse workforces and for decentralized organizations, among units scattered across countries. An appreciation of the culture-bound properties of decision-making can help to optimize inter-firm negotiations, and to predict the strategies of international competitors (Tse, Lee, Vertinsky, & Wehrung, 1988). The intention is not to establish that any one culture will categorically be more creative, but rather, to elucidate indicators of creative performance manifesting within brainstorming contexts.

2. Theoretical background

2.1. Creativity and brainstorming

The importance of creativity cannot be overstated. Progress—of which creativity is so often the impetus—is essential for corporations, if not all forms of social organization. Yet defining and operationalizing creativity is thorny. Achieving measurement consensus is elusive, due to the subjectivity of creativity and whether its nature and subsequent definition is truly cross-culturally invariant (Eysenck, 1994; Niu & Sternberg, 2001). Simonton (1999) invokes a Darwinian perspective, arguing that since a creative idea must prove to be adaptive, "…the creative act may approximate a variation-selection process" (p. 21). Many definitions have emerged over six decades. Stein (1953) defines creativity as that process resulting in a novel work that is acceptable as tenable, useful, or satisfying by a group. Torrance (1971) conceives creativity as a combination of ability, skills, and motivation. Piaget (1962) holds that the creative process evolves as a child advances through the developmental phases. In Western cultures, the criteria for assessing creativity are subjective; consequently there is no way to tell whether a thought is new or valuable until it passes social evaluation (Csikszentmihalyi, 1996). Simonton (1999) asserts that originality and adaptiveness of an idea are judged not by the innovator but rather by the recipients. Thus, creativity manifests itself via the interaction of the person's thoughts and a sociocultural context. The Eastern viewpoint of creativity is somewhat different. In Hinduism, creativity is a spiritual/religious state, rather than an innovative problem solution (Lubart, 1990). With Zen Buddhism, the self is the means to enlightenment and creativity (Wonder & Blake, 1992). These divergent perspectives aside, Eastern and Western conceptualizations view creativity positively (Boden, 1994). Csikszentmihalyi's (1996) definition for creativity guides this research: the ability of a person or a group to generate ideas or products that others deem as novel and appropriate.

Extant research on creativity concentrates mostly on the individual, however inside organizations much creative work unfolds within team settings (Nemeth et al., 2004). The assumption is that teams can better gather together the diversity of information and backgrounds necessary to generate a creative solution or to otherwise achieve optimal task results. However, these diverse aspects require successful management so as to mitigate the problems of coordination, motivation, and conflict that are intrinsic to teams (Jehn, Northcraft, & Neale, 1999). Brainstorming is a widely-employed technique for reducing these troubles. The objective is to generate a plethora of ideas, under the premise that the larger the number, the greater the yield of high quality ideas. To

maximize output, idea evaluation is restricted until all possibilities are exhausted. Osborn (1957) argues that the quantity and quality of ideas produced is greater within a group vs. independent contexts. Yet most research since Osborn's proclamation has found the opposite for the quantity metric: within-group brainstorming productivity is below the sum total produced by the same number of individuals working in isolation, i.e., nominal groups (Mullen, Johnson, & Salas, 1991). Diehl and Stroebe (1991) propose several effects to account for this gap: production blocking (only one of N persons can speak at any moment, with N — 1 listening), evaluation apprehension (the reluctance of members to offer half-baked ideas that might elicit negative responses), and social loafing (i.e., free-riding). Group size is another inhibiting factor, with diminishing returns of individual output for larger groups (Thornburg, 1991). Finally, Paulus and Dzindolet (1993) posit that members adjust their contribution standard downwards, due to the lack of performance incentives.

Most studies operationalize brainstorming performance quantitatively as the number of non-redundant ideas. Some also consider measures for idea quality, including ratings of: originality (Goncalo & Staw, 2006), feasibility (Diehl & Stroebe, 1991), practicality (Buyer, 1988), effectiveness (McLeod, Lobel, & Cox, 1996), and frequency of idea suggestion (Wallach & Kogan, 1965). The plethora of methods for assessing idea quality explains why the findings are equivocal when compared against idea quantity results. Notwithstanding mixed results, brainstorming remains the most frequently used creativity technique (Dugosh & Paulus, 2005). Group brainstorming is valuable when the information required is dispersed across individuals. Thus, one key issue is group diversity. Within group creativity contexts, Thornburg (1991) defines diversity as the number of interacting orientations brought to bear on a problem. Different knowledge levels, experiences, flexibility and perceptions means that diverse groups offer greater creativity potential by cross-fertilizing members' ideas (Murray, 1989). Among the many bases of diversity, perhaps none is more important than culture.

2.2. Creativity and culture

Cultural values serve as the basic motivators in life. As with creativity, culture is general, abstract, and complex; consequently eluding definitional consensus. Sifting through the hundreds of definitions, a common thread emerges, namely that culture is learned, shared, and transmitted. Culture is to society what memory is to individuals, conceptualized as "the sum of learned beliefs, values, and customs that create behavioral norms of a given society" (Yau, 1994, p. 49), or, "the collective programming of the mind, which distinguishes the members of one group or category of people from another" (Hofstede, 1991, p. 5). At the group level, the role of culture is to: institute rules of conduct, set performance criteria, and, establish ways of construing environmental inputs and interpersonal signals.

Self-identity comprises two aspects: personal identities (founded on individual traits, attitudes, and preferences), and social identities (derived from membership in groups). Intergroup behavior distinguishes itself from interpersonal behavior, as the locus of control in the former is on social rather than personal identities (Chen et al., 1998). Intergroup behavior manifests itself when social identity is salient. Social identity theory concerns how self-perceived group membership shapes perceptions and attitudes. Social identity is "that part of an individual's self concept which derives from his knowledge of his membership of a group (or groups) together with the value and emotional significance attached to the membership" (Tajfel, 1978, p. 63). National culture provides a reference framework through which people interpret their daily reality. Defined as patterns of thinking, feeling, and acting rooted in common values and conventions of a society (Nakata & Sivakumar, 2001), national culture is a potent social identity construct that can explain decision-making in international contexts. Cultural diversity exists within borders and subsequently the

terms *nations* and *societies* are not interchangeable. Yet, "…many nations do form historically developed wholes" (De Mooij, 2004, p. 30), and countries are conventionally the analytical unit for international statistics, comparisons, and moreover, international strategies. Thus, ample theoretical and practical justifications exist for conceiving culture at the national level.

2.3. Individualism–collectivism (I–C)

A fundamentally universal issue concerns the respective roles of the individual versus that of the group (Wagner, 1995); a research subject for more than 50 years. I–C orientation deeply anchors within the values/norms systems of cultural members and has major implications across many settings. These include the psychological processes of learning/reinforcement (Haruki, Shigehisa, Nedate, Wajima, & Ogawa, 1984), social perception (Bond & Forgas, 1984), fostering cooperation (Chen et al., 1998), social loafing (Earley, 1989), executive decision-making (Tse et al., 1988), artistic creativity (Niu & Sternberg, 2001), and numerous other social, economic, and political concepts/processes (Markus & Kitayama, 1991). Even from a biological perspective, I–C is the subject of research. Fincher, Thornhill, Murray, and Schaller (2008) found that the more pathogens present within a given ecological niche, the more collectivist that society is; implying that cultural orientation is partly an adaptive biological response to local environments.

Individualism "…implies a loosely knit social framework in which people are supposed to take care of themselves and of their immediate families only, while collectivism is characterized by a tight social framework in which people can distinguish between in-groups and out-groups: they expect their in-group (relatives, clan, organizations) to look after them, and in exchange for that they feel they owe absolute loyalty to it" (Hofstede, 1980, p. 45). Triandis (1995) delineates four I–C traits:

1. *Self conceptions.* The independent view of the self dominates within individualist cultures, whereby the person is an autonomous entity with a distinctive set of qualities. The interdependent self-construal prevails within collectivist cultures, whereby "the self cannot be separated from others and the surrounding social context" (De Mooij, 2004, p. 96). A person holding an independent view is "individualist, egocentric, separate, autonomous, idiocentric, and self-contained" (Markus & Kitayama, 1991, p. 226), whereas the interdependent person perceives that his/her behaviors are determined by the thoughts, feelings, and actions of others. Since others are so important for interdependent (vs. independent) individuals, the in-group/out-group distinction is vital and the subjective in-group boundary tends to be narrower. Individualists' self-conceptions largely flow from personal identities, whereas social identities dominate those for collectivists.

2. *Salience of interpersonal relationships.* Sharing, cooperation, group harmony and welfare are hallmarks of collectivism. Forgas and Bond (1985) found that the Chinese emphasized communal feelings, social usefulness, and acceptance of authority, whereas individualist Australians emphasized competitiveness, self-confidence, and freedom. Collectivists dread social exclusion, whereas the fear for individualists is failing to achieve separation from others (Markus & Kitayama, 1991). Individualists focus more on personal initiative, task achievement and leadership, often to the detriment of relationships, whereas collectivists' emphasis on a sense of belonging and harmonious relationships might be deleterious to task accomplishment (Chen et al., 1998).

3. *Goal relationships.* When a conflict exists between self/group interests, collectivism implies the subordination of personal goals to group ends. Fatalism characterizes collectivist cultures, whereas individualistic culture members are apt to seek control over their own fate. The collectivist puts faith in group decisions; "expertise, order, duty, and security are provided by [the] organization or

clan," whereas the individualist places assurance in individual decisions, seeking "autonomy, variety, pleasure, and individual financial security" (Hofstede, 1980, p. 48).

4. *Relative importance of attitudes and norms.* Within individualist cultures, a strong "I" consciousness is operational, self-actualization is valued, people have the right to private lives, and are encouraged to express private opinions (De Mooij, 2004). In collectivist cultures there is a robust "we" consciousness where group decisions are preferred, and maintaining in-group harmony and avoiding loss of face are paramount. Collectivists' in-groups invade private life and predetermine personal opinions (Hofstede, 1991).

Hall's (1976) context orientation corresponds closely to I–C. In high-context (HC) cultures communication is chiefly for social interaction (i.e., building/maintaining relationships). In low-context (LC) cultures, communication is primarily for information exchange. Most Asian cultures—particularly Chinese—are collectivist and HC, whereas most Western cultures are individualist and LC. Under LC communication information is chiefly "…vested in the explicit code," whereas for HC, most information "…is in the physical context or internalized in the person, while very little is in the coded, explicit, transmitted part of the message" (Hall, 1976, p. 79).

The corollary is that I–C and the corresponding context affects the interpretation/expression of communication. These patterns are instilled during early childhood, when a person is most impressionable and open to learning (Hofstede, 1991). Education plays a key role in shaping who and what people become, as well as influencing their environmental perceptions.

2.4. I–C, education, and creativity

Focusing on mathematical problem-solving and writing abilities, standardized school tests largely ignore creativity (Ford, Harris, & Winborne, 1990). The corollary is that students become convergent thinkers (i.e., searching for the correct answer). Neglecting divergent ways of thinking hinders the development of creativity. Within Asian societies, a high emphasis is placed on education; as manifested by the amount of time Asian (vs. American) students spend in class and on homework (Gonzales et al., 2004), and the higher standardized test scores achieved by Asians, especially in mathematics. American students generally devote less time to educational pursuits; however they typically participate more extensively in extracurricular activities, e.g., part-time employment, sports/hobbies, and dating (Stevenson, Chen, & Lee, 1993). Opportunities to absorb other aspects of life may nurture creativity. The Economist (2007) depicts the Japanese school system as an environment where students work hard and focus on how to take tests versus how to think. Likewise, the Chinese system potentially stifles creativity, because students have little freedom (Gardner, 1989). Students hailing from individualist (vs. collectivist) cultures are more apt to speak up in larger groups, although the hesitation of the latter diminishes in smaller assemblies composed of ingroup members (Hofstede, 1991). Thus, each educational system flows from and reinforces I–C.

3. Research hypotheses

Following the above review, this paper articulates how I–C should impact creative performance. Western society encourages individuals to think independently, whereas Eastern society inveighs against standing apart from the crowd; promoting the importance of upholding social norms. Von Oech (1990) contends that non-conformist ideas are the stepping stones for practical new ones. Kuhn (1970) famously forged the view that scientific progress is greatest under discontinuous paradigm shifts, following challenges to established conventions. Essentially, creativity entails novel ways of observing/deciphering environmental stimuli. Creativity is a product of disjunctive thinking

(Whyte, 1957), and a truly creative person cannot be conforming and vice-versa. Taking account the thoughts of others conflicts with unique expression and innovation, therefore "in an unstructured creativity task in which the goal is to generate as many ideas as possible, Chinese subjects may be at a relative disadvantage" (Markus & Kitayama, 1991, p. 233).

Working independently, the collectivist (vs. individualist) should therefore produce, on average, fewer and less original ideas. These dispositions should carry over into group contexts. People are freer to make their own choices in individualistic (vs. collectivistic) cultures. Group harmony/welfare are accentuated under collectivism. With this emphasis on maintaining traditions and respecting norms, people avoid conflict with in-group members (e.g., by hiding their true feelings). Under individualism there is a greater willingness to confront group members. Individualism entails a self-orientation and an emphasis on self-sufficiency, and since satisfaction and pride derive from one's own contributions/accomplishments, the pursuit of personal goals may not be consistent with group goals.

Conformity should thus occur more frequently in collectivistic cultures. This norm mitigates the beneficial effects of group heterogeneity. People are less likely to develop distinctiveness, compared to social environments where such a norm is deemphasized. The previous review noted that diverse perspectives contribute to creativity. Of relevance to problem-solving contexts collectivist (vs. individualist) groups will likely comprise of homogeneous units. Furthermore, collectivists are more reluctant to stand apart from the group. The inclinations of the collectivist towards conformity, the reluctance to push the boundaries, and the aversion to controversy are likely to function as blocks to creativity. These characteristics are likely to be more acute for collectivists under ingroup contexts (Markus & Kitayama, 1991). Thus:

H1. Working independently (i.e., alone), individualists (vs. collectivists) will produce a greater (H1a) quantity and (H1b) quality (i.e., more original) of ideas.

H2. Working interdependently (i.e., in groups), individualists (vs. collectivists) will produce a greater (H2a) quantity and (H2b) quality of ideas (H2b).

H3. Regarding the quantity (H3a) and quality (H3b) of ideas, individualists' margin of performance over collectivists will be greater in the group vs. independent setting.

A key argument favoring brainstorming is the emphasis on harmony and reducing evaluation apprehension. Most researchers agree that criticism diminishes group creativity (Nemeth et al., 2004). Seeking ingroup harmony, collectivists are less likely to utter negative opinions, and should they utter such opinions they do so with a weaker valence (e.g., "I think that this is a weak idea" is less negatively-valenced than "I think that this is the dumbest idea that I have ever heard"). Individualists are apt to voice disagreement more frequently and with greater intensity. Thus:

H4. Negative verbalizations will be (H4a) uttered more frequently and (H4b) expressed with a greater negative valence by individualists (vs. collectivists).

Overconfidence in general knowledge is a widely observed phenomenon (Moore & Healy, 2008). Asian social norms encourage modesty, and most research supports this stereotype (Lee et al., 1995). Heine and Lehmann (1995) report that Canadians (vs. Japanese) exhibit more unrealistic optimism, which the authors attribute to individualists' predisposition to distort perceptions in a self-enhancing manner. Kitayama, Markus, Matsumoto, and Norasakkunkit (1997) propose that enhancement of the self, versus self-criticism and subsequent self-improvement, result from and support the very ways in which social acts/situations are collectively defined and subjectively experienced. They found that because American (Japanese) social

situations are conducive to self-enhancement (self-criticism), participants act in kind. In line with the independent self-construal, individualists should be more prone to overconfidence, whereas collectivists' tendency to be self-critical will attenuate their expressions of confidence:

H5. Individualists (vs. collectivists) will express higher levels of confidence in (H5a) their personal and (H5b) their group's creative abilities.

Social identity theory implies that the propensity for collectivistic behavior enhances under ingroup environments, due to the greater sway of the group on members' consciousness. Since the independent self-construal implies that internal attributions are paramount for individualists, confidence levels should be similar for independent and group contexts but not so for collectivists.

H6. Among collectivists, confidence levels will be lower within group vs. independent settings.

4. Methodology

4.1. Participants and I–C

Hofstede (1991, p. 53) reveals that Taiwanese and Canadians scored among the lowest and highest on individualism, scoring 17 and 80, respectively; ranking 44th and 4th out of 53 cultures, respectively. Students were recruited from two urban universities, in Taipei and Montreal, representing collectivists (n = 128, i.e., 32 groups of 4) and individualists (n = 128, i.e., 32 groups of 4), respectively. Students' demographic homogeneity allows for more precise predictions, and consequently a stronger test of theory (Calder, Phillips, & Tybout, 1981). Participants received $10 for their time (45 min). A screening procedure ensured the recruitment of Canadians with individualistic orientations (i.e., Western European ancestry: Hofstede, 1991). Given Taiwan's ethnic homogeneity, this was not an issue. As a manipulation check, participants' I–C score were measured using Hui and Yee's (1994) INDCOL scale. The 33 items (0 = strongly disagree, 5 = strongly agree) capture five factors representing I–C: colleagues/friends supportive exchanges (8 items), parents consultation/sharing (5 items), kin/neighbors susceptibility to influence (9 items), parents/spouse distinctiveness of personal identity (5 items), and neighbor social isolation (6 items).

4.2. Dependent variables

The *quantity of ideas generated* entails the number of non-redundant, task-appropriate ideas produced (Dugosh & Paulus, 2005). Following the protocol described in Bouchard and Hare (1970, p. 52), overlapping ideas counted as one idea. Similar to the method employed by Goncalo and Staw (2006), the *quality of ideas generated* entails subjective ratings, given the impracticality of objectively classifying ideas in terms of their absolute quality. Each idea was independently scored by two raters (blind to the hypotheses), ranging from 1 = an extremely unoriginal idea ("anyone would have thought of that") to 5 = an extremely original idea ("I never would have thought of that"). In line with participants' instructions, raters disregarded considerations of idea feasibility, practicality, or absurdity. Independent raters' scores were averaged. Raters were in agreement for 90.6% of the originality ratings, defined as when idea ratings fell within one point of each other on the 5-point scale (Diehl & Stroebe, 1991; McLeod et al., 1996). Average quality entails summing up the originality ratings for all unique ideas, then dividing by the number of ideas. Taiwanese data was translated into English, and then independently back-translated into Chinese. The degree of communality between versions was 98.1%, with incongruent data reviewed by both translators to reach consensus. Prior to judgments, handwritten protocols were typed (to eliminate penmanship

biases) and randomized. Raters were unaware that half the data was originally in Chinese.

Quantity and *valence of negative verbal cues generated* are the third and fourth dependent variables. Four coders (two each for Canadian/Taiwanese) observed the videotaped sessions. Coders were trained to recognize types/intensities of negative utterances. A negative verbalization comprised any verbal utterance intended to express disagreement, with each such utterance counting as one. For each dataset, coders had to agree on what constituted a negative verbal cue. Negative verbal cues were rated (here, coders worked independently) regarding the intensity of expression on scale of 1 = mildly negative (e.g., "Well, that may not work because…") to 5 = extremely negative (e.g., "No way that can work!"). Judgments were deemed in agreement when ratings fell within one point of each other (88.3% of cases). Ratings were averaged to produce a score for each verbalization. In the post-session questionnaire, participants self-reported their *degree of confidence*, in terms of how creative (1 = low, 7 = high) they believed their own/group's ideas were compared to those generated by other individuals/groups.

4.3. Design and procedure

The experiment consists of a within-subjects design for task type: all participants partake in nominal (i.e., working independently) and group (i.e., working interdependently) brainstorming tasks. Group size was set at four in line with the extant research (e.g., Diehl & Stroebe, 1991). The duration of independent and interdependent tasks was five and ten minutes, respectively. Experimental stimuli consisted of popular, geographically/culturally- neutral brainstorming tasks. For the *Thumbs Problem* (Bouchard & Hare, 1970; Dugosh & Paulus, 2005), participants generated ideas about the practical benefits that would arise if everyone had an extra thumb on each hand as of next year, from which they then chose the idea that would provide the greatest benefit(s). For the *Tourist Problem* (Nijstad, Stroebe, & Lodewijkx, 1999; Paulus & Dzindolet, 1993), participants generated ideas on how to attract tourists to an imaginary underwater city. The best idea was that which participants judged would attract the most tourists. Feedback from pretests motivated the provision of stimuli illustrations (Appendix A). The order of the tasks and stimuli were counterbalanced. For each cultural orientation, half the groups (16 out of 32) first completed the independent task (groups 1–8 and 9–16 performing the thumbs and tourist problems, respectively) and then, the interdependent task (1–8/9–16: tourist/thumbs). Remaining groups performed the interdependent (17–24/25–32: thumbs/tourist, respectively) then independent (17–24/25–32: tourist/thumbs) tasks.

Upon arriving at the laboratory, participants were told that the study explores brainstorming effectiveness, that their group results would be compared against other groups (to promote an ingroup orientation), and that sessions would be videotaped (to record interactions). Participants were briefed on Osborn's brainstorming rules (1957, pp. 83–84), since providing instructions enhances the generation of ideas (Parnes & Meadow, 1959). For the Taiwanese, these rules were translated into Chinese, and then independently back-translated into English, with the latter version checked by still another translator. For all brainstorming tasks, participants were instructed to generate as many ideas as possible using the provided pencils and papers. For the interdependent task, participants nominated one member responsible for writing down all ideas. Afterwards, each group evaluated all ideas and then (surreptitiously timed), chose the best idea. Participants completed the post-session questionnaire, and were debriefed.

5. Analyses and results

T-tests (one-tailed) compare scores on the INDCOL factors and assess hypotheses. Significant differences in the expected direction were obtained on 4 out of the 5 I-C factors. Overall, the I–C assumption regarding the two samples was confirmed.

As shown in Table 1 and Fig. 1, working independently, individualists substantially outscore collectivists in terms of idea generation (supporting H1a), with mean scores of 9.15 and 5.53, respectively (a difference of almost 40%). However in terms of idea quality (i.e., originality), collectivists outscore individualists (refuting H1b), with mean scores of 2.98 and 2.86, respectively. Similarly and corroborating H2a, working interdependently, individualists generate substantially more unique ideas than did collectivists, with an average of 30.53 vs. 16.13 ideas per group (a difference of 47%). However, the idea quality difference contradicts H2b, with collectivist groups outperforming their individualist counterparts (3.12 and 2.90, respectively). Within group contexts, differences emerge for the number and valence of negative verbalizations (Fig. 2). Individualists (vs. collectivists) express more negative utterances, and convey these with a greater degree of intensity (confirming H4a–b). Congruent with H5a–b, individualists exceed collectivists in idea confidence, in both independent/interdependent contexts.

Confirming H3a, individualists' margin of higher performance (re: idea quantity) is higher in group settings as compared to the individual counterparts (t = −6.64, p < .001). Whereas the mean I–C difference for the independent tasks is 3.62 ideas, the performance gap for the group tasks averages 14.40 ideas, despite the greater potential for production-blocking as the number of expressed thoughts increases. The individual versus group context did not yield a significant effect either for the originality of ideas (t = 0.65) or for the degree of confidence (t = −0.10), thus H3b and H6 are rejected respectively.

Table 1
Mean scores.

| Factor/hypothesis		I	C	t-Test	Result
CF	Colleagues/friends supportive exchanges (I < C)	16.13	20.92	8.29***	Supported I < C
PA	Parents consultation/sharing (I < C)	3.64	3.37	*not-sig.*	Not supported I = C
KN	Kin/neighbors susceptibility to influence (I < C)	−1.72	−2.94	−1.77*	Supported I < C
PS	Parents/spouse distinctiveness of personal identity (I < C)	1.87	−0.71	−6.10***	Supported I < C
NE	Neighbor social isolation (I < C)	−6.92	−9.78	−3.94***	Supported I < C
H1a	Ideas per-person (I > C)	9.15	5.53	−5.14***	Supported I > C
H1b	Idea originality per-person (I > C)	2.86	2.98	1.69*	Not supported I < C
H2a	Ideas per-group (I > C)	30.53	16.13	−8.86***	Supported I > C
H2b	Idea originality per-group (I > C)	2.90	3.12	5.31***	Not supported I < C
H4a	Negative verbal cues uttered (I > C)	1.94	1.00	−2.24*	Supported I > C
H4b	Valence of negative verbal cues (I > C)	1.64	0.88	−2.46**	Supported I > C
H5a	Confidence in individual creative abilities (I > C)	3.59	3.24	−2.06*	Supported I > C
H5b	Confidence in group creative abilities (I > C)	3.97	3.65	−1.92*	Supported I > C

*** p < .001.
** p < .01.
* p < .05.
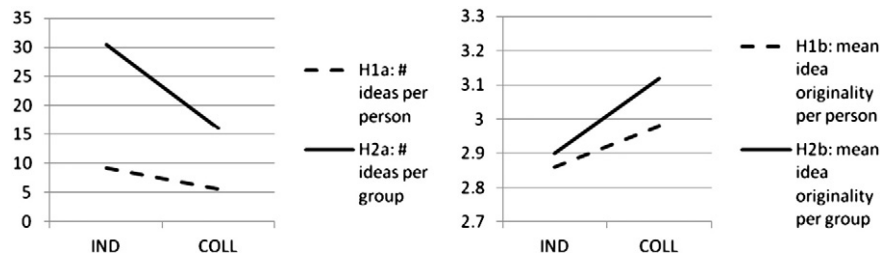
Fig. 1. Number and originality of ideas.

6. Discussion

After verifying that the two cultural groups differ on I–C orientation, the findings corroborate the notion that creative outcomes are partly cultural-bound. The primary measure of brainstorming performance has long been idea output, since the likelihood of obtaining an appropriate solution increases when choosing from a larger set of ideas (Dugosh & Paulus, 2005). In both solitary/group brainstorming contexts, individualists demonstrate an edge regarding idea quantity. The greater heterogeneity inherent to low-context cultures like Canada is more conducive to spontaneous activity (Hall, 1976), including idea productivity. Given the larger, presumably more diverse pool of items to draw upon, the average idea quality should thus be higher among individualists (vs. collectivists), but the opposite ensued, in both independent/interdependent environments. Reflecting the need for consensus, high-context and homogeneous cultures are apt to exhibit coordinated activity (Hall, 1976). The fact that collectivists' ideas are fewer in number but higher in quality implies that they exercise greater caution in contributing ideas. These results corroborate Li and Shallcross (1992), who found that while American students were quicker to complete an experimental problem-solving task, their Chinese counterparts were more accurate in their solutions. Thus, while individualists focus more on *doing*, the collectivists value *thinking before doing*. Markus and Kitayama (1991) maintain that "in Chinese culture…there is an emphasis on synthesizing the constituent parts of any problem or situation into an integrated or harmonious whole" (p. 227). By reflecting before doing, Taiwanese produced fewer—but higher quality—ideas than the more action-oriented Canadians.

Other explanations for collectivists' idea quality superiority stem from evaluation apprehension and social loafing. Promoting harmony, emphasizing freewheeling, and building upon others' ideas, brainstorming is championed as a conflict remedy. Researchers contend that conflict, including anticipating criticism of one's ideas, increases evaluation apprehension. Even with instructions directing people to refrain from criticism, "individuals may still worry about negative evaluations—albeit silent criticisms" (Nemeth et al., 2004, p. 366). Collectivists should be more apprehensive about criticism and losing face if their peers poorly receive their wilder ideas, thus promoting a reduction in the quantity of ideas generated. Evidence for individualists' predilection towards criticism emerges for the quantity and intensity of critical remarks, both far greater among Canadians. Markus and Kitayama (1991) pinpoint *jen* (i.e., humanity) as a paramount Chinese

virtue, which they describe as reflecting a "person's capability to interact with fellow human beings in a sincere, polite, and decent fashion" (p. 228). Social loafing occurs more often within individualist cultures (Wagner, 1995). Compared to the individualist seeking personal gain, the collectivist feels pressure to perform up to the group's expectations because s/he anticipates that others will do so in kind (Earley, 1989). With others' judgments looming larger, the collectivist invests greater cognitive effort on idea deliberation versus generation, consistent with the obtained findings. The inherent tendency of collectivists for self-criticism explains why they downplay idea quality confidence. Individualists' higher confidence stems from their greater immunity from peers' criticisms, and possibly, their proclivity to distort event perceptions in a self-enhancing manner. Unless differential recognition or rewards are offered, one's contribution towards group accomplishments conflicts with individualists' self-interest drive. Individualists are less motivated to invest cognitive effort into outcomes accruing to the group rather than to themselves.

The greater readiness for individualists to explicitly disagree corresponds to an enhanced ease of free expression and subsequently higher idea generation during group sessions. The collectivist virtue of maintaining harmony explains why collectivist (vs. individualist) groups were quicker at deciding upon the best idea (138 vs. 222 s, t = −3.26, p < 0.01, as per the videotaped sessions). Efficiency is thus another positive aspect (alongside idea quality) of collectivist group decision-making. One downside of greater efficiency is the enhanced likelihood of groupthink among collectivists (Janis, 1982). The lower productivity means that there were fewer ideas for collectivists to ponder over, precluding definitive conclusions regarding the speed of group decision-making. Furthermore, given limited time allotment, individualists (with their low-context predisposition) may hone in on the explicit brainstorming instructions exhorting idea quantity, and focus more on generation and less on quality. Future research should test this reflective versus action dichotomy by examining how cultural groups differentially respond to the same instructions.

People working independently outperformed real groups in terms of idea generation. This was true for individualists and collectivists alike; providing additional evidence that team brainstorming productivity is inferior to the results from the same number of individuals working in isolation. Regardless, practitioners remain committed to the group brainstorming technique (Nijstad et al., 1999). If the diversity of values/information is deemed essential for ingenuity, the improved quality of team output should overcompensate for the shortfall in
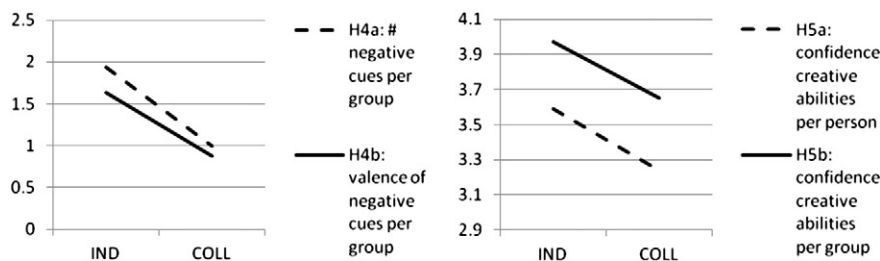

Fig. 2. Disagreement and confidence.

productivity. Here, regarding idea quality/confidence, real groups out-perform nominal groups; however, these differences lack statistical significance.

A key implication of the findings concerns how creative ideas engender value for customers, in terms of the tasks associated with the identification and prioritization of market opportunities. Conventional wisdom suggests that organizational settings that promote conformity are neither conducive to creativity in the product development process nor ideal for uncovering novel marketing opportunities. Numerous researchers underscore the value of conflict as a means of stimulating thought. The present findings on idea quality, however, imply that performing such tasks while avoiding open conflict suits collectivists' social motives, stimulating the motivation and performance of group members (Jung & Avolio, 1999). Although most creative ideas do not materialize into final products, they often form the impetus for further deliberation. The finding that nominal groups exceeded real groups for quantity but not for quality suggests that a two-step procedure might be ideal, whereby people work independently when generating ideas and then interdependently when deliberating their worth.

Are collectivist societies well-suited for the contemporary organization that thrives on creative input? Certain quarters argue that the economic strides made by East Asian countries are more the product of a hard work ethic (vs. innovation). Taiwanese society has been more outward-looking for innovation, and the Taiwanese have evidently been successful in applying foreign concepts/technologies. Goncalo and Staw's (2006) brainstorming research reports that individualists exceed collectivists on every measure of creativity, and the authors speculate that collectivist cultures may be incongruent with the ethos of modern firms. The present idea quality findings indicate otherwise. Individualistic contexts encouraging debate and open criticism may indeed spawn the larger—but not necessarily reap the better—set of creative ideas. Managerially, the social pressures underlying collectivism facilitates the firm's capacity to muster employees' efforts. For the collectivist, feelings of accomplishment derive from group outcomes whereas for the individualist, from personal outcomes. Recognition and reward arrangements should therefore align with I–C values. As stated by Earley (1989), "most American management theories are based on a self-interest motive that may not be appropriate for an inter-cultural model" (p. 578). Whereas individualists prefer rewards reflecting personal achievement, collectivists favor equal distribution among members based on group accomplishment (Chen et al., 1998). Future I–C studies should test the role of incentives by manipulating the salience and recipient (group vs. individual) of rewards.

7. Limitations and conclusions

One methodological criticism concerns whether the assembly of students for brainstorming purposes constitutes an actual ingroup. Being from the same university students should consider one another as peers. Defining the ingroup in collectivist cultures is situationally-dependent; normally encompassing family/friends, the relevant groups can also include neighbors, peers, or even the country as a whole. The groups had a common purpose—idea generation—and the experimenter encouraged a sense of teamwork/competitiveness. With the exception of their nationalities, students across the two samples were demographically similar. Matched samples allow for a greater chance of identifying cultural differences in brainstorming. Today's students are tomorrow's managers, and culture's resilience implies that the I–C traits should persist over time.

The Taiwanese are not prototypical of all Asian cultures. Whereas South Korea, Thailand, and Mainland China rate closely to Taiwan on the I–C index, Japan scores around the midpoint of countries (Hofstede, 1991). Individual members vary in the intensity to which they adhere to cultural norms, and hence, the extent that these norms sway day-to-day actions. With increasing globalization and the corresponding marketization of societies, Belk, Ger, and Askegaard (2003)

contend that people focus more on the self and less on the group. Similar to the disposition-situation debate in personality psychology (Buss, 2009), some researchers claim that rather than constituting absolute states or opposite poles, individualism–collectivism coexist within the same person, manifesting differentially according to the situation at hand (Kagitcibasi, 1997).

A second limitation concerns the subjective, potentially culture-bound criteria, of evaluating creativity, although the neutrality of the tasks employed should curtail any culture-specific rater biases. Ultimately, tasks involving languages will always pose cross-cultural challenges. The short duration of the sessions potentially induced participants to focus on the quantity of ideas, and this prominence may have been greater among individualists. Future studies could manipulate idea quantity/quality by priming participants to focus on different time horizons. Canadian and Taiwanese cultures vary on time orientation, with the former short-term-oriented (i.e., STO), and the latter, long-term-oriented (i.e., LTO). Within LTO cultures, decision-making is generally more conservative and by consensus, made on the basis of all possible information (Nakata & Sivakumar, 2001). Collectivists are generally LTO whereas individualists tend to focus the immediate horizon (Hofstede, 1991).

Other cultural dimensions comprise avenues for creativity research. Power distance (PD) impedes the flow of two-way communication. Within high-PD cultures, superiors exhibit authoritarian tendencies and subordinates are passively obedient (Tse et al., 1988). Low-PD cultures value merit, ability, initiative, drive, and an even playing field (Nakata & Sivakumar, 2001). Collectivist and individualist cultures typically rank high and low on PD, respectively. Within interdependent societies there is greater reliance on power figures. Research should consider the role of leadership in creative performance, and how leadership qualities differ between I-C groups. Studies should manipulate group size to ascertain what size optimizes performance. The hesitation of collectivists to speak up is proportionate to group size (Hofstede, 1991). Social loafing is more common among individualists, and social loafing rises with increasing group size (Earley, 1989).

Workforces are increasingly diverse along numerous bases. The literature on the antecedents of team performance is large; however, findings on the effects of diversity are equivocal (McLeod et al., 1996). Some studies demonstrate that diverse teams outperform homogeneous teams. Others report that homogeneous teams avoid the poor communication patterns and excessive conflict bedeviling heterogeneous teams. Under social identity theory "…group members establish positive social identity and confirm affiliation by showing favoritism to members of their own social category" (Jehn et al., 1999, p. 745). This can provoke hostility, and/or otherwise disrupt group interaction. Research is necessary to illuminate when homogeneous and collectivist groups fare better than heterogeneous and individualist groups (and vice versa). The answer lies not only in the task nature and in the workgroup members' abilities to manage interactions with dissimilar others, but also in how these teams are constituted and how performance is assessed. According to similarity-attraction theory (Byrne, 1971), people prefer interacting with similar others, and therefore, group composition will converge towards homogeneity when individuals can voluntarily select fellow members. Group heterogeneity is more likely when membership is not under one's volition (e.g., arbitrarily imposing groups, in a top-down/random manner). Naturally-formed groups often lack diversity, thereby "…undermining their potential for learning, insight, and problem-solving effectiveness" (Jehn et al., 1999, p. 744). Yet even when performance benefits accruing from diversity are clearly demonstrable, studies show that members often report the group experience as dissatisfying (Amason & Schweiger, 1994). Under imposed group conditions, individualists ought to fare better. Under collectivism, greater ingroup/outgroup salience hampers the formation and performance of new group members, whereas novel groups should coalesce more quickly under

individualism to tackle the joint task. Indeed, "…group formation among [individualist] students is much more ad-hoc, according to the task, or to particular friendships and skills" (Hofstede, 1991, pp. 62–63). The counterargument is that group performance may be superior when members share "…some history and cohesion" (Dugosh & Paulus, 2005, p. 319), which is more pervasive under collectivism. Creativity is not merely the product of individual autonomy; creative ideas must also find acceptance at the macro or group level. Consequently, researchers should investigate I-C differences regarding the four stages of the creative process: preparation, incubation, illumination, and verification (Ghiselin, 1985).

Will the differences in cooperative decision-making diminish over time as inter-country connections intensify? A curious paradox of globalization is that even as the importance of the nation-state erodes, there is evidence of resurgence in cultural identities. As companies globalize, workforces and customers alike are increasingly heterogeneous. Elucidating the culturally-bounded properties of creativity enables the expatriate manager to learn from and adapt to different groups. Understanding how cultural characteristics explain team processes and outcomes is crucial for theory building in all disciplines concerned with social groupings and decision-making.

Acknowledgment

Appendix A. Extra-thumb and underwater city illustrations
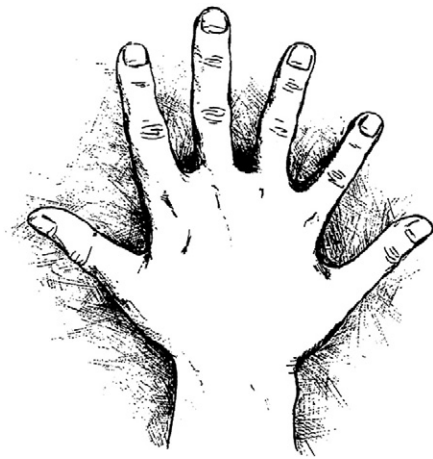
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