Online Social Network Interactions: A Cross-cultural Comparison of Network Structure on McDonald's Facebook Sites between Taiwan and USA

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ABSTRACT

A cross-cultural comparison of social networking structure on McDonald's Facebook fan sites between Taiwan and the USA was conducted utilizing the individualism/collectivism dimension proposed by Hofstede. Four network indicators are used to describe the network structure of McDonald's Facebook fan sites: size, density, clique and centralization. Individuals who post on both Facebook sites for the year of 2012 were considered as network participants for the purpose of the study. Due to the huge amount of data, only one thread of postings was sampled from each month of the year of 2012. The final data consists of 1002 postings written by 896 individuals and 5962 postings written by 5532 individuals from Taiwan and the USA respectively. The results indicated that the USA McDonald's Facebook fan network has more fans, while Taiwan's McDonald's Facebook fan network is more densely connected. Cliques did form among the overall multiplex and within the individual uniplex networks in two countries, yet no significant differences were found between them. All the fan networks in both countries are relatively centralized, mostly on the site operators.

1. Introduction

Past research demonstrates that cultural factors have played certain roles affecting the design elements of websites for multinational corporations. Users from different cultures may prefer certain layouts, navigations, and graphics of websites. Multinational corporations must adapt to customers' cultural orientations in order to accomplish business goals in a global market (e.g., Alexander, Thompson, & Murray, 2016; Würtz, 2005). In addition to websites, different forms of social media have increasingly become important links connecting between and among individuals' behaviors and society (Pelet et al., 2016). However, few studies have examined the interaction patterns

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between and among users via social media, let alone the interaction patterns in different cultural contexts.

Culture affects societal norms and communication practices. One of the most studied cultural dimensions is individualism and collectivism (Taras, Rowney, & Steel, 2009). According to Hofstede (2001), this dimension suggests that individuals demonstrate different communication behaviors in different cultural contexts, and that these affect individuals' social connections to the interpersonal networks surrounding them. Thus, we need more understanding about how individuals behave on social media. Due to limited resources, the present study will examine only one multinational corporation, McDonald's, the fast food restaurant company, in Taiwan and the USA in order to understand the interaction patterns between and among fans and the site operators on the McDonald's Facebook fan sites. Taiwan and the USA, from east and west respectively, were chosen because the two countries are traditionally on the two opposite ends of the individualism/collectivism dimension in Hofstde's cultural model (2001).

Therefore, the goal of this paper is to explore cultural differences in network structure resulting from the interactions among fans and site operators on McDonald's Facebook sites in Taiwan and the USA. Since the preliminary examination of the data indicated that most of the fans interacting on the fan sites visited the fan sites only one time during the sampling period, the fans for the present study are more like webpage users than fans who engage in a variety of information behavior described in fan studies literature (Price & Robinson, 2017). Thus, the present study will focus mostly on relevant webpage studies. Four network indicators that have been described as network structure in the past are employed in the present study. They are as follows: size, density, cliques, and centralization (Chang, 2009).

2. Literature Review

2.1 Individualism and Collectivism

Culture is "the interactive aggregate of common characteristics that influence a human group's response to its environment" (Hofstede, 2001). One of the common characteristics of culture is that different human societies show different degrees of integration between individuals and the society as a collective. In an individualistic cultural context, the connection between individuals and the society is loose. Children learn to think of themselves as "I," and these cultures have a "language in which the word I is indispensable for understanding" (Hofstede, 2001). Children are educated to stand on their own two feet as they grow up. They leave home when they become adolescents; as students, they choose playmates according to their tasks and current needs; as employees, they expect that their personal interests should coincide with their employer's interests. No emotional dependence is developed between them and the society (Hofstede, 2001).

Hofstede (2001) used the concept of "low-context communication" developed by Hall (1976) to describe the relatively loose interpersonal networks observed in individualistic cultures. According to his description, individual relations with others in these societies is functional instead of emotional.

Most of the interpersonal relationships begin and end quickly. Thus, individuals tend to communicate with each other via explicit and direct codes, and rely less on how the communication content was expressed and its environmental context (Hall, 1976).

In collectivistic cultures, on the other hand, the communication between individuals and the society is dense. Children learn to think of themselves as "we-group" or "in-group". From birth, they are integrated to strong, cohesive in-groups. These cultures have a "language in which the word I is not pronounced" (Hofstede, 2001). They have been educated to be loyal to the in-groups to which they belong in exchange for lifelong protection by these in-groups. As students, they make friends based on their pre-existing in-group connections; as employees, their personal goals are always subordinate to the in-group goals. Emotional dependence is developed between them and their society.

This relatively dense interpersonal network observed in collectivistic cultures was described by the concept of "high-context communication" (Hall, 1976). According to Hall's description, individual relations are relatively stable and can last for a long time. Thus, how the communication content was expressed and its environmental context are important than the explicit and direct codes. Nonverbal cues, such as voice tone, facial expression, meeting time and place will be considered as well.

2.2 Four Indicators and Fan Networks

A fan network consists of a set of actors and relations defined on the actors. Actors refer to people, organizations, or social entities involved in social relations (Wasserman & Faust, 1994). The present study considers the fans and site operators participating on McDonald's Facebook fan sites in both countries to be actors in the sampling period. Relations are considered to be formed when fans or site operators write and reply to posts on the sites.

Four indicators are used to describe the McDonald's Facebook fan network, as follows.

2.2.1 Size

Network size refers to the number of actors in the network (Monge & Contractor, 2003) — that is, the number of fans and site operators participating on the sites. Network size has been positively associated with individuals' social resources, self-concept, and well-being (Lönnqvist & Deters, 2016; Nabi, Prestin, & So, 2013). More recent research related to fan sites has focused on building consumer loyalty and their intention to purchase via promotions on fan sites (e.g., Ruiz-Mafe, Martí-Parreño, & Sanz-Blas, 2014). These studies were conducted under the assumptions that increasing numbers of fan are associated with increasing business interests. However, researchers have yet to examine the size of fan networks participating on Facebook sites from the perspectives of individual's benefits or business interests. Thus, the present study plans to assess the size of fan networks; it asks whether Taiwan's fan network will outnumber the USA's fan network because of their increasing likelihood to integrate into fan groups, or whether the USA's fan network is larger than Taiwan's fan network because of their personal consumer interests.

2.2.2 Density

Network density refers to the number of linkages in a network (Nooy, Mrvar, & Batagelj, 2005). Density scores are between 0 and 1, and are expressed as a fraction of the maximum possible ties in the network for the relations under study (Wasserman & Faust, 1994). A high level of density value represents more links between individuals in a network, indicating a more cohesive group. Collectivistic cultures feature dense networks in which individuals are inclined to interact with one another in exchange for lifetime protection by their in-groups. Accordingly, it is reasonable to suggest that Taiwan fans might embed themselves in the McDonald's Facebook sites more than USA fans in order to access material and information resources. This dependence on one's interpersonal networks might result a denser Taiwan fan network than the USA fan network.

2.2.3 Clique

A clique consists of a subgroup of three or more individuals who are connected directly or indirectly with one another (Nooy, Mrvar, & Batagelj, 2005). This group of individuals who interact more with one another than with others is thus cohesive, or densely connected (Farrell & Fudge, 2013). The interaction is likely to surround interests and resources related to common benefits (Monge & Contractor, 2003). Past research has suggested that individuals are most likely to be influenced by those to whom they are strongly connected (Rice, 1993). Accordingly, the present study might find that McDonald's Facebook fans clique together due to common interests, such as complaints for the unreasonable price of a product. Do cliques form on McDonald's Facebook fan sites? If they do, will the number of cliques differ between the two different cultural contexts? It is plausible that collectivistic Taiwan fans will be more likely to form cliques, because they tend to maintain strong ties with one another. Or perhaps individualistic USA fans will have more cliques because they tend to associate with other fans to serve their current needs relating to complaints or compliments.

2.2.4 Network centralization

This indicator refers to a network where connections are concentrated between and among a few individuals (Monge & Contractor, 2003). These individuals have direct links with others who have less or no contacts with each other. They dominate the message flow in their network (e.g., da Silva, Avelar, & Farina, 2014). For the present study, the McDonald's Facebook fan network will be considered to be centralized if most of the postings are directed to a handful of fans. These fans then become the stars of the fan network, and might affect the viewpoints of the other fans (Wasserman & Fasut, 1994). Accordingly, this study will assess whether McDonald's Facebook sites are centralized around a few fans in both countries. Does cultural context affect the number of star fans? Is it plausible to assume that individualistic USA fans voice themselves more strongly, thus attracting more fan followers?

From the previous discussion, the following research question is proposed:

- **Research question:** *Do network size, density, clique, and centralization differ by different cultural contexts?*

3. Method

3.1 Data Collection and Sampling

Postings that were written by Facebook site operators and fans during the whole year of 2012 were collected from the two official McDonald's Facebook sites in Taiwan and the USA. Postings that: a) contained video or pictures only, with no text, b) contained only page links with no text, and c) were spam messages were excluded from further analysis. During 2012, a total of 80 and 34 postings were written by Taiwan and the USA site operators, respectively, and a total of 8,342 and 44,145 postings were written by Taiwanese fans and the USA fans, respectively. Due to limited resources, only one posting that was written by the site operators, along with its accompanying fan replies, per month was randomly chosen for further analysis. As a result, the final data set consists of 12 and 10 postings written by Taiwanese and USA site operators, respectively (no postings were written in February and June by the USA site operators), and of 1,002 and 6,006 postings written by 896 Taiwanese fans and 5,577 USA fans, respectively. To ensure the confidentiality of all the participants, including site operators and fans in the sampling period, all the identity markers were replaced with numbers during the analysis process. Thus, site operators from the two countries were assigned the number "1" and each fan was assigned a number, starting from the number "2", based on the time at which their responses appeared on the board during the sampling period. Please see Table 1 for detailed information regarding the distribution of postings and samplings.

Table 1. Distributions of Postings and Sampling

	Taiwan			USA		
Month	Operators	Fans	Samples	Operators	Fans	Samples
Jan	7	358	17	1	1384	596
Feb	3	302	80	—	—	—
Mar	5	366	61	2	1587	814
Apr	8	636	205	2	2339	780
May	4	267	42	3	11501	850
June	4	355	73	—	—	—
July	7	644	51	5	4782	1323
Aug	9	923	189	3	2621	322
Sep	5	770	35	9	13605	284
Oct	7	539	91	2	1362	444
Nov	5	233	15	4	3194	360
Dec	16	2949	143	3	1806	233
Total	80	8342	1002	34	44145	6006

3.2 Measurement

"The main goal of social network analysis is detecting and interpreting patterns of social ties among actors" (Nooy, Mrvar, & Batagelj, 2005). Actors, for the present study, refer to Facebook site operators and fans sampled from McDonald's Facebook sites in Taiwan and the USA in 2012. Social ties were established when fans replied to site operators' postings or to other fans' postings.

Four indicators were used to analyze the McDonald's fan networks, as follows.

3.2.1 Size

The number of site operators and fans involved in writing and replying on the McDonald's Facebook sites.

3.2.2 Density

The total number of observed links between and among fans and site operators divided by the total number of possible links between and among fans and site operators (Kincaid, 1993).

3.2.3 Cliques

The preliminary examination indicated that the McDonald's fan networks in both countries are relatively sparse. Thus, the present study adopts a more relaxed definition of clique (n-clique) to identify cliques. An n-clique includes clique members "who are all directly or indirectly connected to one another via no more than n links" (Monge & Contractor, 2003). The present study employed a 2-clique technique to identify fan cliques.

3.2.4 Network centralization

This indicator measured the variation of individual centrality. The more direct links with others one had in the network, the more central one was considered to be. Centralization is a measure of dispersion of individual centrality (Wasserman & Faust, 1994). More variation yields a more centralized network. A star-network, where one star connects to all other individuals but other individuals are not connected among themselves, is a highly centralized network with a centralization score of 1 (Nooy, Mrvar, & Batagelj, 2005).

3.3 Analysis

UCINET 6.629, a network analysis software program (Borgatti, Everett, & Freeman, 2002), was used to calculate the network indicators. Netdraw (Borgatti, 2002) was used to display graphical representations of the fan networks.

4. Results

UCINET analysis revealed that the overall Taiwan fan network consists of 885 individuals. The number of posts exchanged between fans and site operators (or links) is 979. Taiwan fan network density is .001. The network included 69 cliques, and had a centralization score of .898.

The overall USA fan network consists of 5,568 individuals. The number of posts exchanged between fans and site operators (or links is 8,320). The USA fan network density is .000. The network included 161 cliques, and had a centralization score of .938. Please see Table 2 for the descriptive statistics of the four network indictors between the two countries and see Figure 1 for the graphical representations of the two fan networks.

Table 2. Descriptive Statistics of the Network Indicators

Network Content	Country	Network Indicators			
		Size	Density	Cliques	Centralization
Multiplex	Taiwan	885	.001	69	.898
	USA	5568	0	161	.938
Product discussion	Taiwan	352	.009	21	.375
	USA	3192	.001	14	.251
Negative evaluation	Taiwan	318	.005	11	.250
	USA	1305	.001	15	.242
Positive evaluation	Taiwan	217	.006	15	.202
	USA	2476	.001	26	.278
Humor	Taiwan	47	.001	5	.038
	USA	637	0	6	.084
Current events	Taiwan	12	0	1	.011
	USA	253	0	3	.054
Socializing	Taiwan	12	.002	2	.021
	USA	71	0	5	.039

Shaded areas indicate significant differences of the network indicator between two countries.

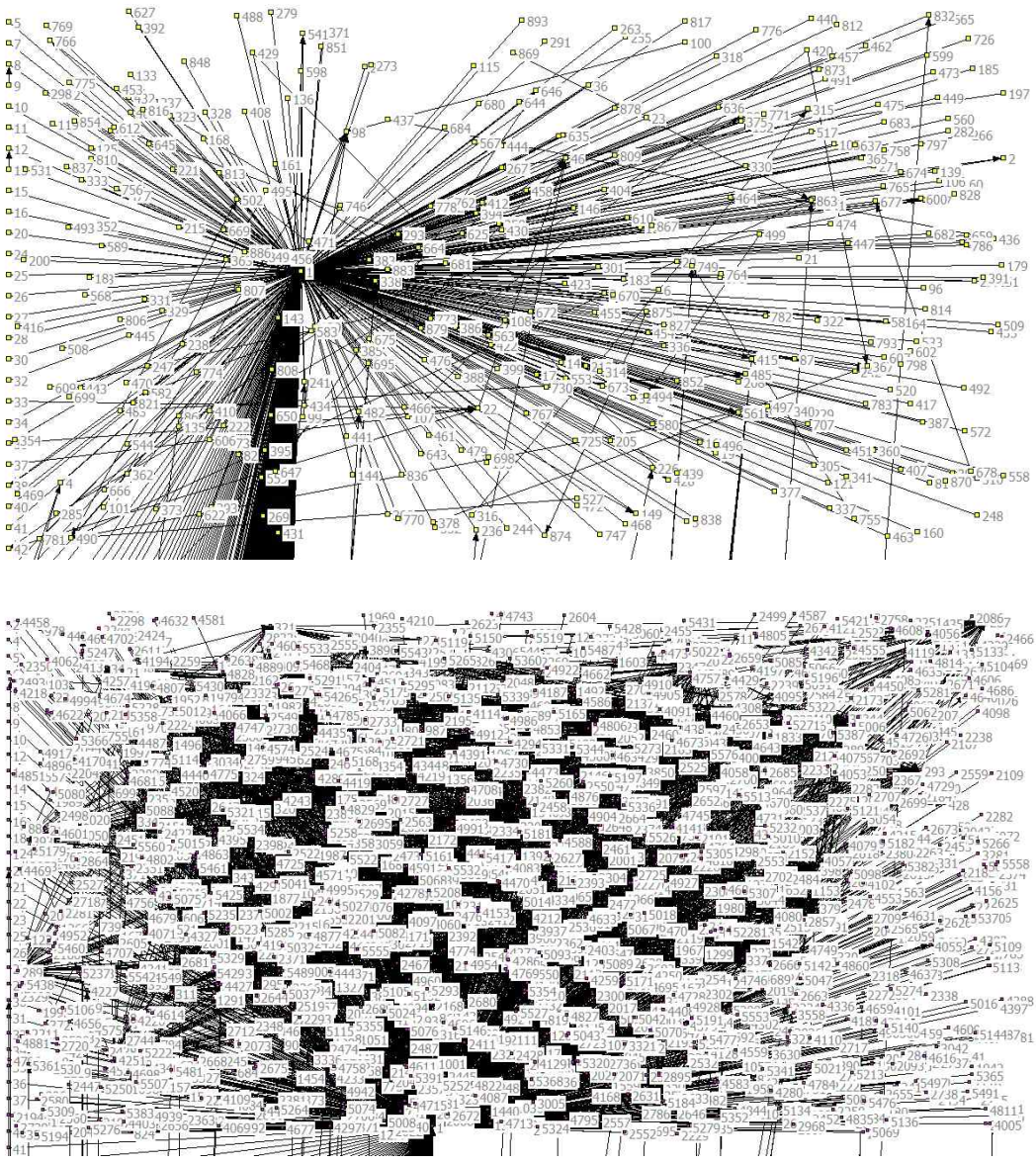

Fig. 1. The overall multiplex networks of Taiwan (top) and USA (bottom)

To determine the differences across the four indicators, a series of t-tests were performed. In terms of network size, the results indicated that more fans ($t = 2.78$, $p < .05$) and more linkages ($t = 3.53$, $p < .05$) were found in the USA fan network. For network density, a higher level of density was reported in Taiwan fan network ($t = 3.99$, $p < .05$). Lastly, no differences were found in terms of the number of cliques ($t = 1.42$, $p > .05$) and network centralization ($t = .72$, $p > .05$) between the two countries. Figure 2 displays charts comparing the results of the analysis of the four indicators between the two countries.

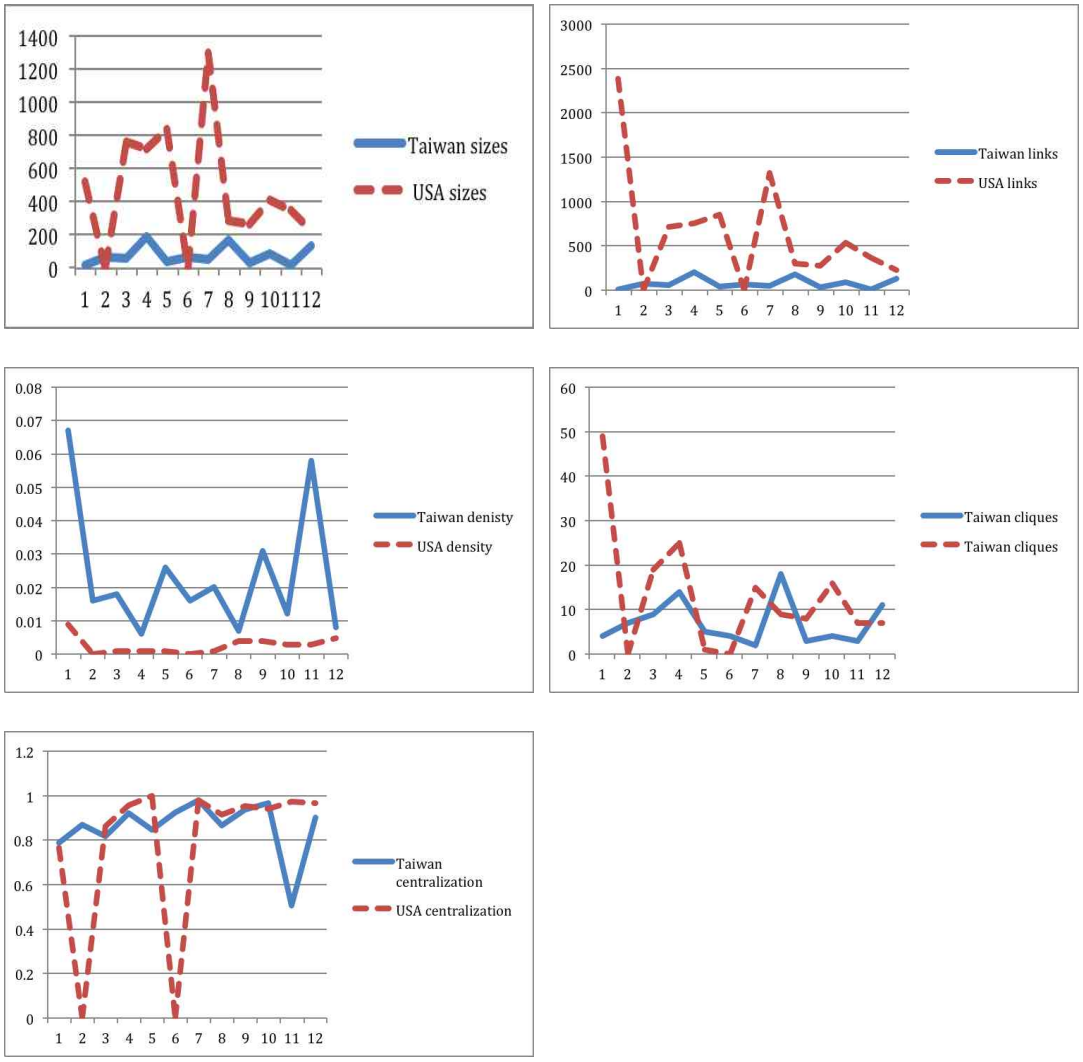

Fig. 2. Distribution of size, link, density, clique, centralization between two countries (from top to bottom)

4.1 Further Analysis

The preceding results are based on the overall multiplex network of fan posts in both countries. Since the overall network size is relatively large, it is worth asking if the results will vary when a smaller network is compared between two cultural contexts. Thus, the study proceeded to specify the content of the postings, and categorize the networks according to content, so that a smaller network based on the content could be established.

Three graduate research assistants were in charge of the content coding process. Since no previous fan posts category system exists, extensive discussion among the three coders and this author were

conducted. A seven-category system was developed. The categories are as follows:

- Product discussion: General discussion related to McDonald's products, marketing strategies, promotions, and advertising.
- Positive evaluations: Positive statements complimenting McDonald's products, brand, personnel attitude, and service.
- Negative evaluations: Negative statements, such as complaints or sarcasm about McDonald's products, brand, personnel attitude and service.
- Humor: Funny statements about all McDonald's-related issues.
- Current events: Discussion about the current events that may relate to McDonald's. These events include prices, unemployment rates, employee benefits, etc.
- Socializing: Chats between and among fans.
- Others: Posts that cannot be categorized into the preceding six categories. (Due to the miscellaneous content, this category was removed for further analysis.)

Hosti's formula (1969), which accounts for agreement between three coders, was used to compute inter-coder reliabilities. Inter-coder reliabilities ranging between .87 and .93 were obtained.

Based on the categorization of the content of the postings, the following research question was proposed:

Do the network size, density, cliques, and network centralization in each of the individual uniplex networks differ between the two cultural contexts?

4.1.1 Results

Please see Figures 3 through 8 for the graphical representations of the six individual uniplex fan networks for the two countries.

In terms of network sizes, among the individual uniplex Taiwan fan networks, the product discussion network was the largest, with 352 fans, followed by negative evaluations, with 318, positive evaluations, with 217, humor, with 47, current events, with 12, and socializing, with 12. For the USA fan networks, the product discussion network was the largest, with 3,192 fans, followed by positive evaluations, with 2,476, negative evaluations, with 1,305, humor, with 637, current events, with 253, and socializing, with 71. Four significant results were found: More USA fans participated in positive evaluations ($t = 2.49$, $p < .05$), negative evaluations ($t = 3.59$, $p < .05$), current events ($t = 2.29$, $p < .05$), and socializing networks ($t = 2.55$, $p < .05$). Please see Figure 9 for charts displaying the significant results of the analysis of network size between the two countries.

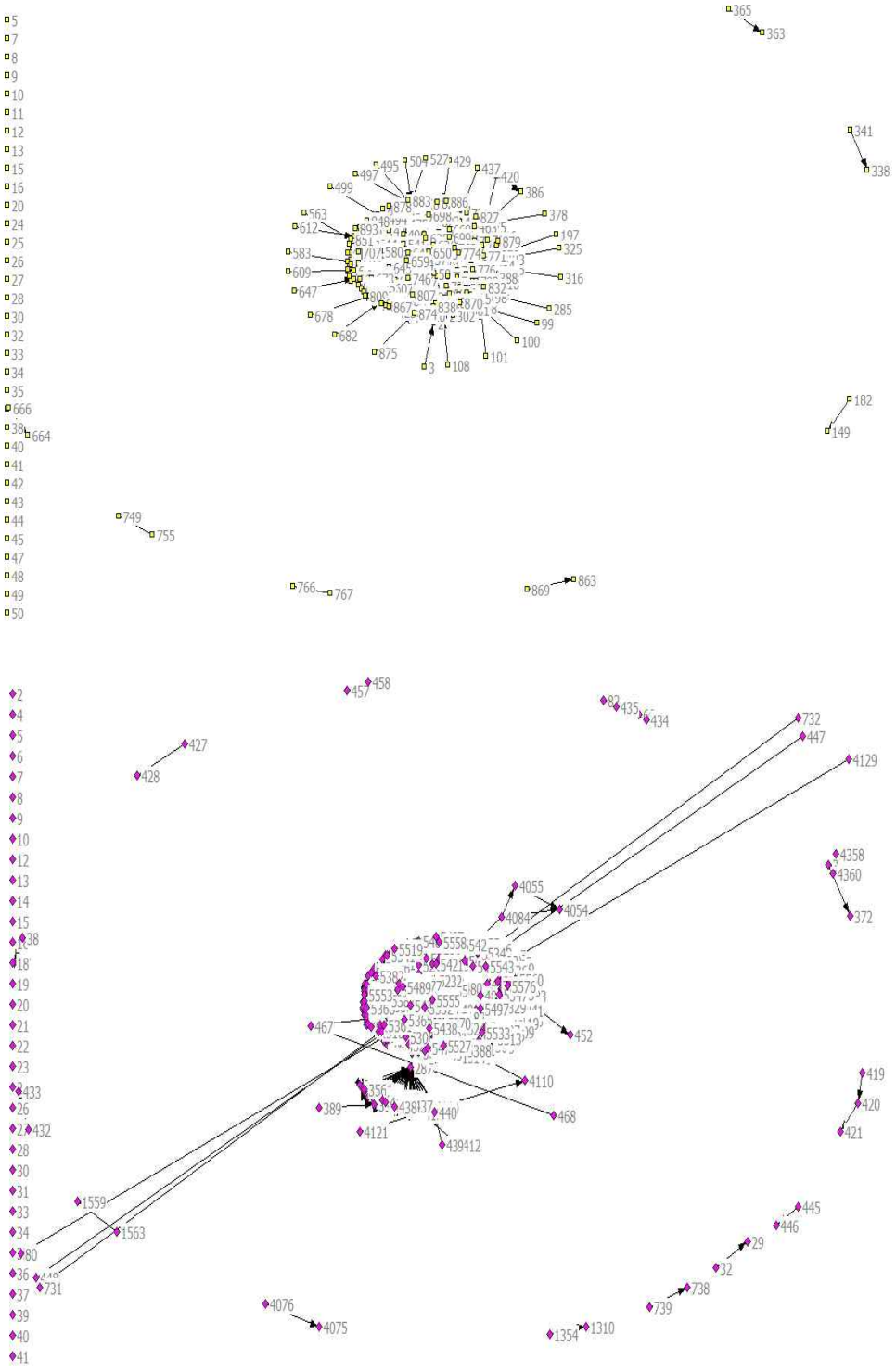

Fig. 3. Product discussion networks of Taiwan (top) and USA (bottom)

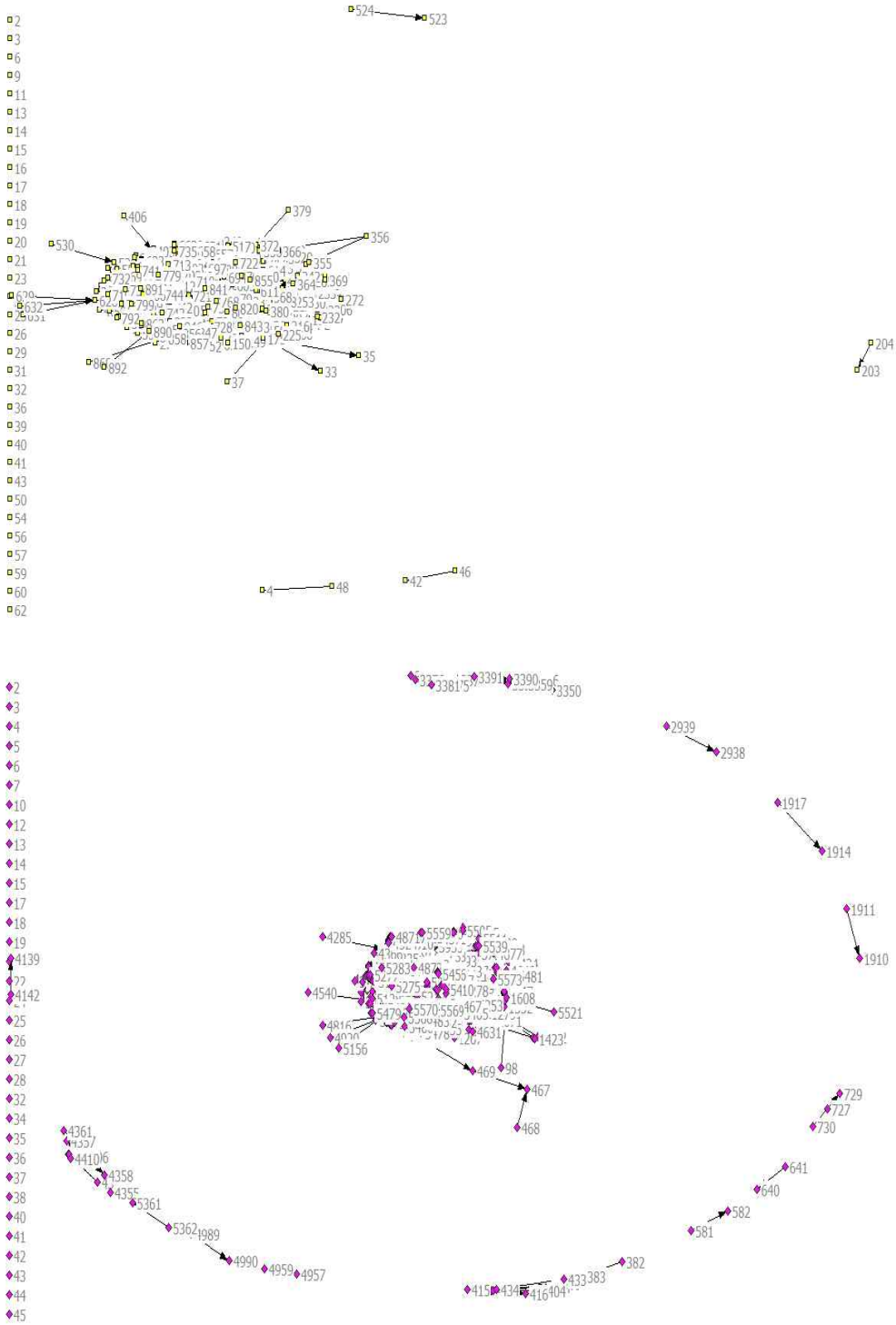

Fig. 4. Negative evaluations networks of Taiwan (top) and USA (bottom)

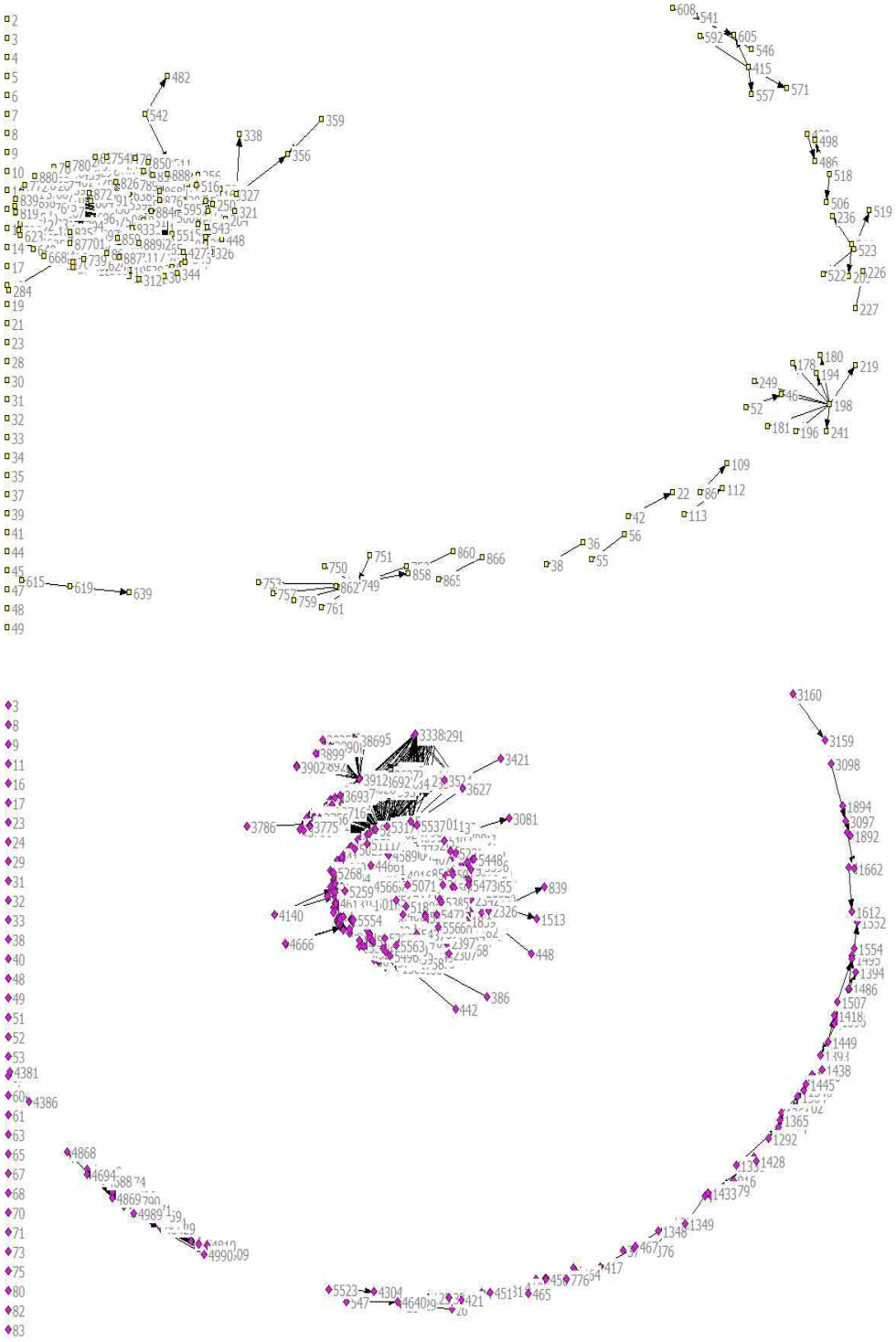

Fig. 5. Positive evaluations networks of Taiwan (top) and USA (bottom)

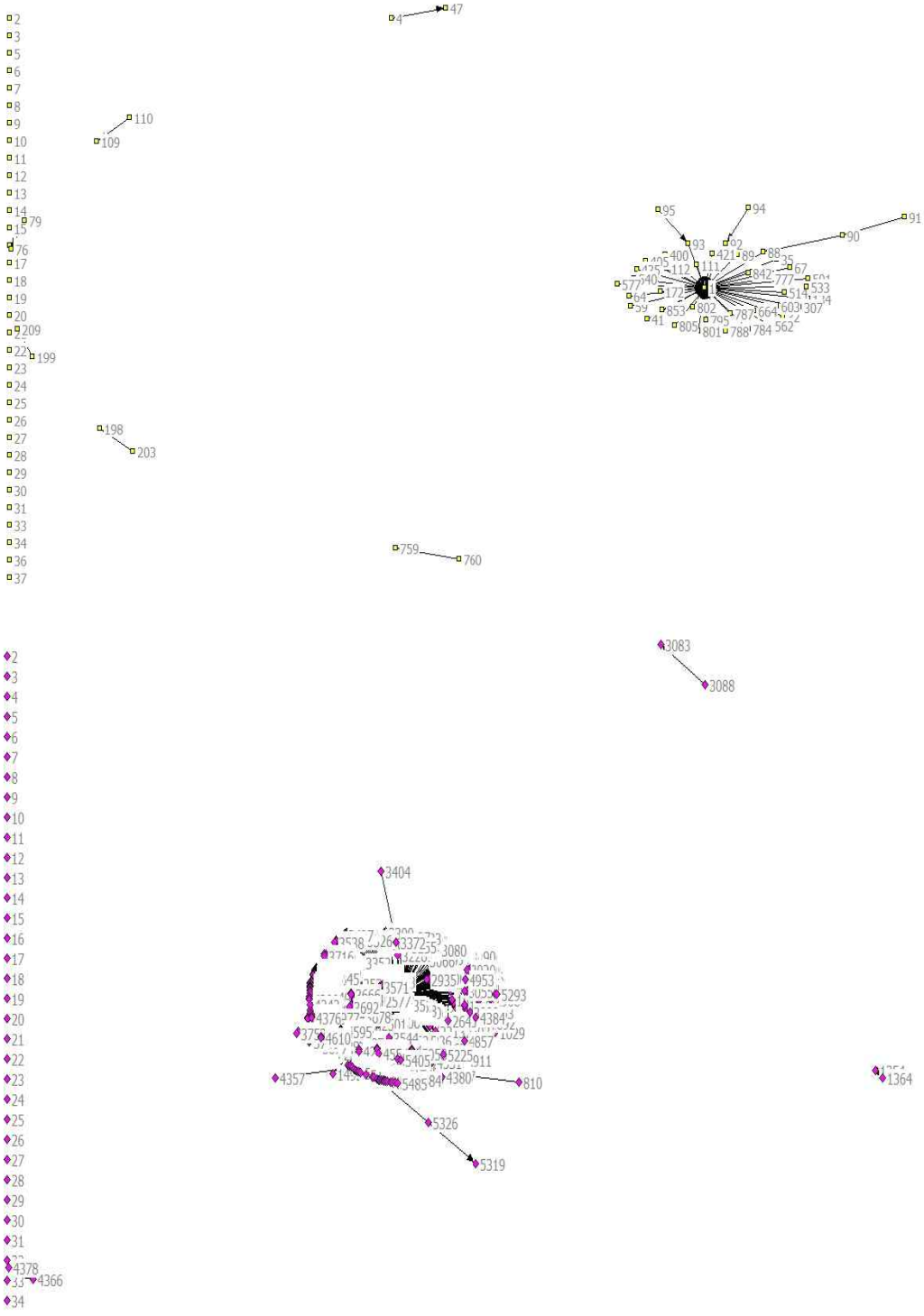

Fig. 6. Humor networks of Taiwan (top) and USA (bottom)

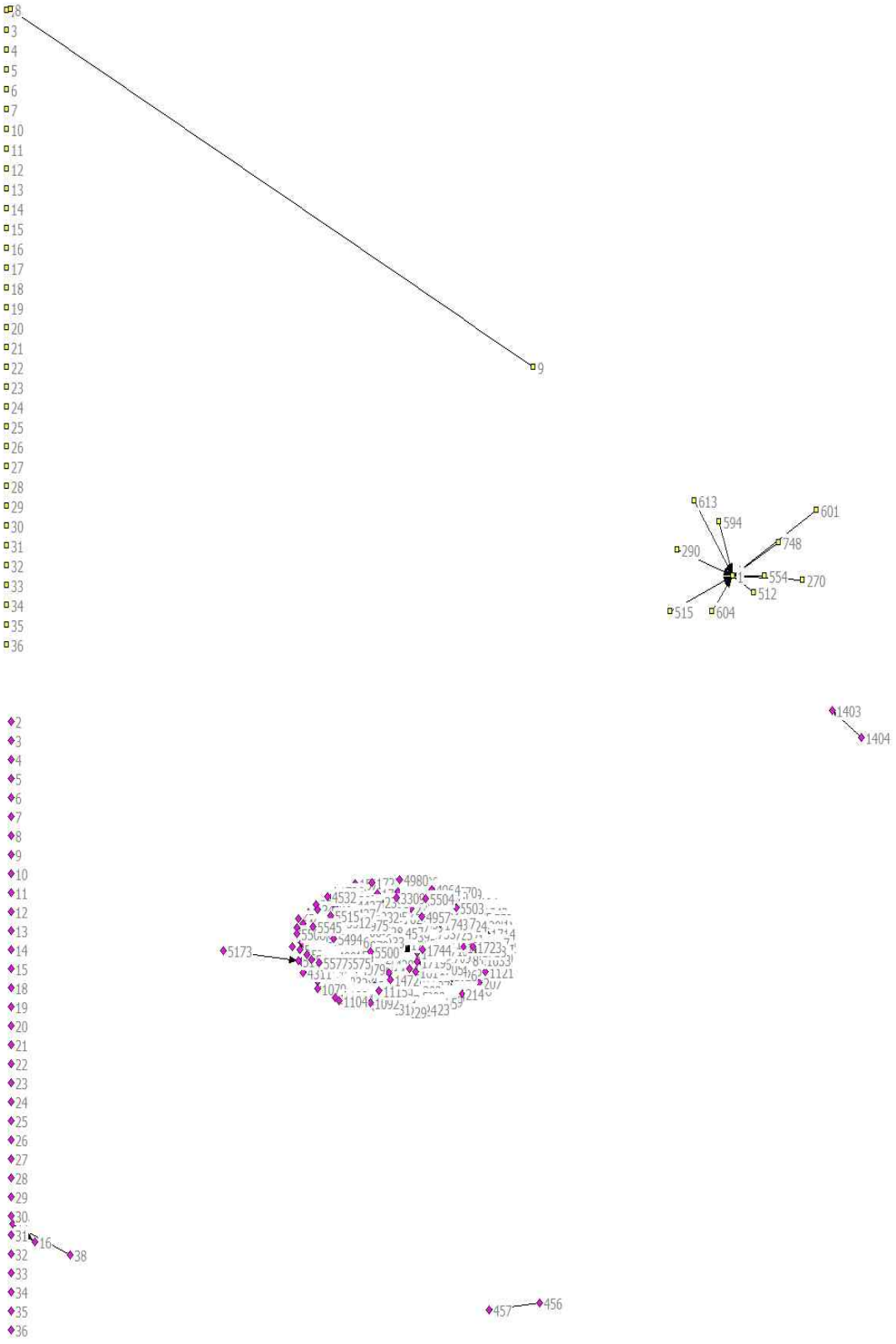

Fig. 7. Current events networks of Taiwan (top) and USA (bottom)

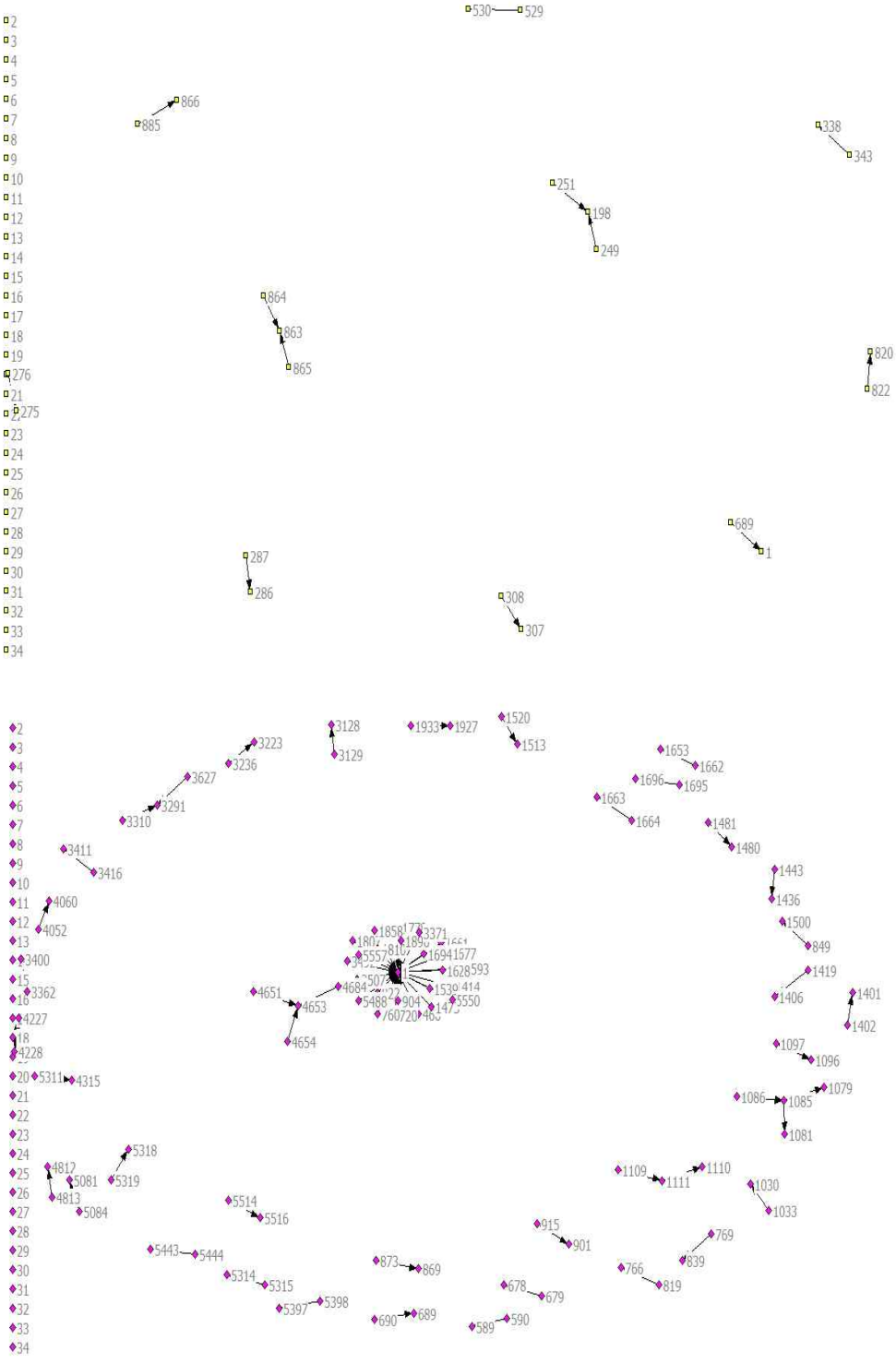

Fig. 8. Socializing networks of Taiwan (top) and USA (bottom)

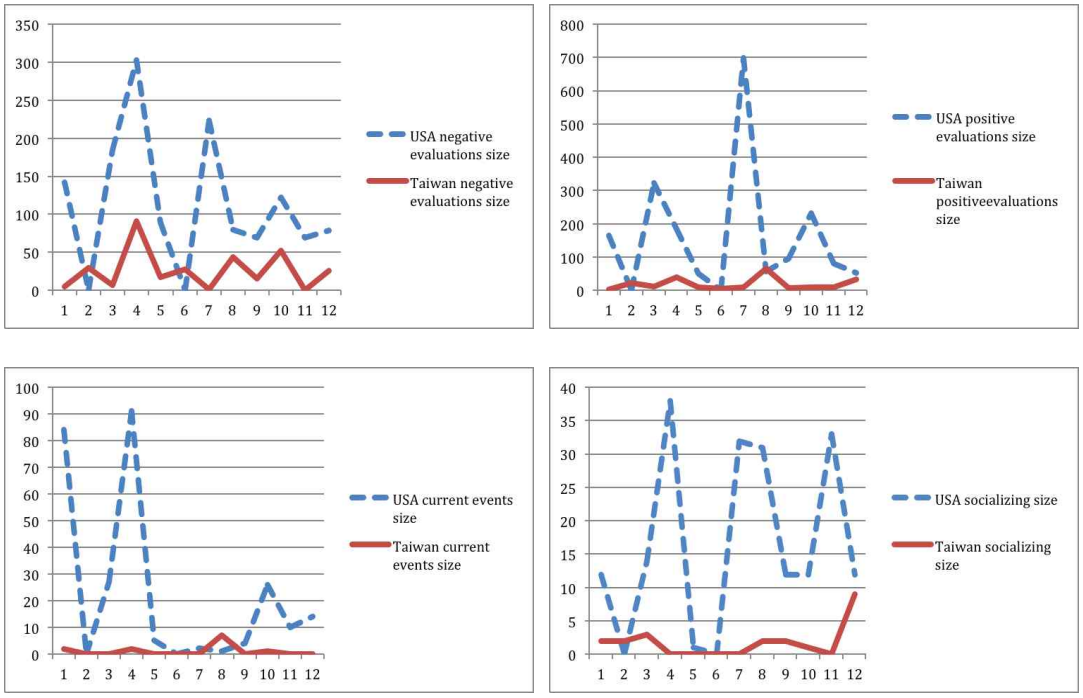

Fig. 9. Distribution of size in negative evaluations, positive evaluations, current events and socializing networks between two countries (from top to bottom)

In terms of network density, two significant results were found: Taiwan fans have a higher level of density in products discussion ($t = 4.37$, $p < .05$) and negative evaluations networks ($t = 2.46$, $p < .05$). Please see Figure 10 for charts displaying the significant results of the analysis of network density between the two countries.

In terms of cliques, among the individual Taiwan fan networks, product discussion has the most number of cliques, with 21, followed by positive evaluations, with 15, negative evaluations, with 11, humor, with 5, socializing, with 2, and current events, with 1. For individual USA fan networks, positive evaluations have the most number of cliques, with 26, followed by negative evaluations, with 15, product discussion, with 14, humor, with 6, socializing, with 5, and current events, with 3. No significant differences were found in the number of cliques in each of the uniplex network between two countries.

In terms of network centralization, all the individual uniplex fan networks are relatively centralized in both countries. One significant result was found: USA fans have a higher level of centralization in the current events network ($t = 2.85$, $p < .05$). Please see Figure 11 for chart displaying the significant result of the analysis of network centralization between the two countries.

All the significant results, including those from the overall multiplex network and from the individual uniplex network, are indicated in Table 2.

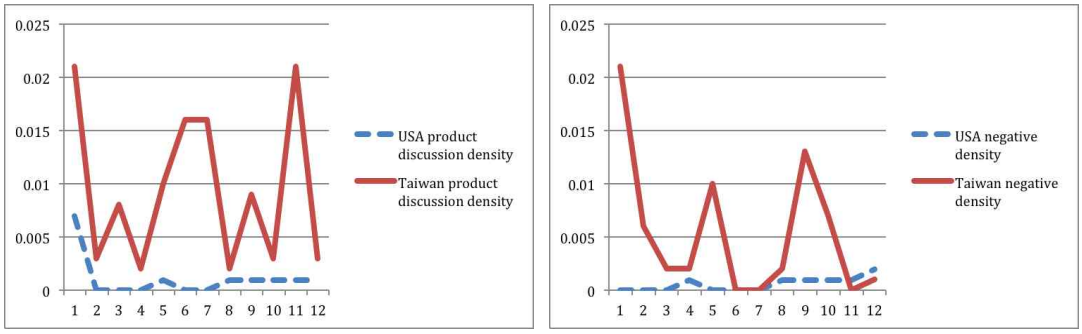

Fig. 10. Distribution of density in prodcuts discussion and negative evaluations networks between two countries (from top to bottom)

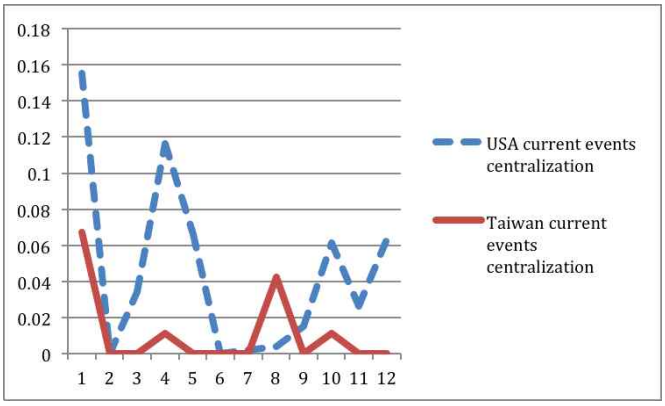

Fig. 11. Distribution of centralization in current events networks between two countries

5. Discussion

In general, the results indicated that the USA McDonald's Facebook fan network has more fans, while Taiwan's McDonald's Facebook fan network is more densely connected. Cliques did form among the overall multiplex and within the individual uniplex networks in two countries, yet no significant differences were found between them. All the fan networks in both countries are relatively centralized, mostly on the site operators. In terms of network content, both Taiwan and the USA fans write and reply the most within the product discussion category. However, in addition to general discussion in the product networks, Taiwan fans prefer to post negative comments, while USA fans prefer positive comments. In addition, Taiwan fans formed dense product discussion and negative evaluations networks. Lastly, it appears that a group of USA fans concern about current events, which was not observed in Taiwan's current events network.

More discussion with implication for future studies are reported in the following paragraphs.

McDonald's USA fan network consists of more fans and more links than the Taiwan network in both the overall multiplex network and the individual uniplex networks. However, the significant difference reported in this study may be due to the uneven population distribution in the USA and Taiwan, respectively. One thing worth noticing is that most of the fans post only once in the observation period. A further examination of the data revealed that less than 7 percent of Taiwan fans post once (60/896), while less than 6 percent of USA fans post once (316/5577). That is, over 90 percent of the fans only paid one visit to the McDonald's Facebook site. Why don't the "visitors" turn into "fans"? Future studies might explore answers to this question.

The other interesting finding regarding network size is that Taiwan fans prefer to post negative content, while USA fans prefer to post positive content. From the perspective of collectivism, is it easier to integrate into "in-groups" by complaining about the behaviors of "out-groups"? Or, from another dimension of Hofstede's cultural model, Taiwan fans are more masculine-oriented, which emphasizes money and performance, and observes the lifestyle of "live in order to work." Accordingly, Taiwan fans thus tend to complain more, because they treat everything as work. They have to be tough and consider performance, with the belief that big and fast is beautiful. Future studies could follow up this line of research.

In term of network density, as expected, the present study demonstrated that the collectivistic overall Taiwan fan network is denser than the individualistic USA one. A closer look at the data indicates that the two uniplex Taiwan networks of product discussion and negative evaluation were denser than the USA ones. These two networks correspond to the first and second largest fan networks in which Taiwan fans like to exchange posts. That is, not only do more Taiwan fans discuss products and complain, but also they discuss and complain extensively with each other. Past research has suggested that a larger network coupled with denser connections results in a more supportive network. This supportive network helps individuals to access more information and material resources (Farrell & Fudge, 2013; Walker, Wasserman, & Wellman, 1994). Why do Taiwan fans choose to talk about products and give negative evaluations more — to form a cohesive network? The association between network content, network size, and the level of network density requires further examination for future studies.

In terms of cliques, fans do form cliques regardless network content, and the number of cliques did not vary between the two cultural contexts. Like past research suggesting that individuals form cliques for similar interests (Farrell & Fudge, 2013), McDonald's Facebook fans clique together to discuss, compliment, complain, or just to chat with each other, regardless of cultural contexts. Still, the USA fans form more cliques in the positive evaluations network, while Taiwan fans form more in the product discussion network. In traditional interpersonal settings, it is easier to form affectionate relations with others via complimenting comments (Canary, Cody, & Manusov, 2008). It seems that individualistic USA fans resort to the most efficient way to build relationships. From the perspective of masculinity and femininity mentioned earlier, it is also plausible that the more femininity-oriented USA fans are more cooperative and maintain a friendly atmosphere on the McDonald's Facebook site.

As for the fact that the largest amount of cliques are observed in Taiwan product discussion network, it could be accounted for by another dimension in Hofstede's cultural model: uncertainty avoidance. This dimension refers to "the extent to which the members of a culture feel threatened

by uncertain or unknown situations" (Hofstede, 2001). Taiwanese fans, belonging to a more high-uncertainty avoidance culture, are more anxious and thus endure more stress. As mentioned earlier, a more supportive network might help individuals to cope with stress and anxiety. Accordingly, Taiwan fans may release their anxiety and stress through extensive writing and replies with others to fulfill the need for clarity and guidance surrounding their McDonald's-related activities. Whether there are other explanations for the observed findings in terms of network content and the number of cliques merits further examination.

The other interesting finding is that a few cliques formed in the humor networks in both cultural contexts. Humor has been demonstrated to be associated with communication satisfaction and job performance in organizational settings (Jalalkamali et al., 2016). The role that humor plays in a fan network, and the association between the use of humor and cultures, merits further investigation.

Also, the results revealed that a few cliques formed in both countries in the socializing networks where fans chat among themselves with no reference to McDonald's at all. In traditional organizational settings, informal communication facilitates the generation of innovative ideas (Johnson, 1993). According to fan studies literature, "fans have always been inherently social" (Price & Robinson, 2017). It is the interaction of discussing and debating among fans that builds up the fan community of transaction, interest, fantasy, and relationship (Baym, 1998; Emmanouloudis, 2015; Rheingold, 2000). Thus, what role does socializing play on fan sites for businesses? Although the socializing networks consist of the least number of fans in both countries, it is worth noticing for future studies.

Finally, in terms of network centralization, most of the links concentrated on site operators in both countries. As mentioned earlier, most of the fans are one-time visitors who visit only to reply to the site operator's posting. Strictly speaking, these one-time visitors are not fans according to the fan studies literature (Price & Robinson, 2017). The site operator never replies to fan postings. Is this the main reason that fans rarely come back? If these site operators or the management tried their best to turn the "visitors" or "passersby" into "simple fans", "casual fans" or even "dedicated fans", who would benefit from the formation of a real fan community on a business site? The business, the fans, neither or both?

In addition to the site operators, the results found a few stars centralized in the USA current events networks. Does an individualistic culture featuring direct and explicit communication offer a more comfortable context to discuss current events than a collectivistic culture featuring indirect communication? The role that current events plays in a fan network, and the association between the discussion of current events and cultures, merits further investigation.

6. Conclusion

The present study is the first attempt to examine a multinational corporation's Facebook fan site in different cultural contexts using a network approach. The results suggest that fan networks are relatively centralized, large but sparse, and consist of one-time-visit fans regardless of cultural context. As predicted in Hofstede' cultural mode, collectivistic Taiwan fans did have a higher level of connection among themselves than did the individualistic USA fans.

In addition, the present study provides a categorical system to classify the content of fan postings. It appears that network content may affect the level of network size, density, cliques, and centralization. Due to limited resources, the present study explores only fans sites on one type of multinational corporations, which might limit the external validity of the overall findings. Future studies should explore this line of research in different cultural contexts using more types of fan sites.

References

Alexander, R., Thompson, N., & Murray, D. (2017). Towards cultural translation of websites: a large-scale study of Australian, Chinese, and Saudi Arabian design preferences. *Behaviour & Information Technology, 36*(4), 351-363.

Baym, N. (1998). The emergence of online community. In S. Jones (Ed.), *Cybersociety 2.0: Revisiting computer-mediated communication and community* (pp. 35-68). Thousand Oaks, CA: Sage.

Borgatti, S. P. (2002). *NetDraw software for network visualization.* Analytic Technologies: Lexington, KY.

Borgatti, S. P., Everett, M. G.., & Freeman, L. C. (2002). *Ucinet for Windows: Software for social network analysis*. Harvard, MA: Analytic Technologies.

Canary, D. J., Cody, M. J., & Manusov, V. L. (2008). *Interpersonal communication: A goals based approach* (4th ed.). Macmillan.

Chang, H. J. (2009). Online supportive interactions: Using a network approach to examine communication patterns within a psychosis social support group in Taiwan. *Journal of the American Society for Information Science and Technology, 60*(7), 1504-1517.

da Silva, A. S., Avelar, A. B. A., & Farina, M. C. (2014). The nurse as an integration agent in handoff: A social networks analysis perspective. *African Journal of Business Management, 8*(19), 922.

Emmanouloudis, A. (2015). *You are not alone. The emergence of fan communities around user-generated content: a comparative analysis*. Unpublished master's thesis, University of Amsterdam, the Netherlands.

Farrell, L. C., & Fudge, J. (2013). An exploration of a quasi-stable online network: A longitudinal perspective. *Computers in Human Behavior, 29*(3), 681-686.

Hall, E. T. (1976). *Beyond culture*. New York: Doubleday.

Hofstede, G. (2001). *Culture's consequences: International differences in work-related values*. Newbury Park, CA: Sage.

Hosti, O. (1969). *Content analysis for the social sciences and humanities*. Reading, MA: Addison-Wesley.

Jalalkamali, M., Iranmanesh, M., Nikbin, D., & Hyun, S. S. (2016). An empirical analysis of the effects of humor on communication satisfaction and job performance in international joint ventures in Iran. *Journal of Management & Organization*, 1-17.

Johnson, J. D. (1993). *Organizational communication structure*. Norwood, NJ: Ablex.

Kincaid, D. L. (1993). *Communication network dynamics: cohesion centrality and cultural evolution*. Norwood: Ablex.

Lönnqvist, J. E., & große Deters, F. (2016). Facebook friends, subjective well-being, social support, and personality. *Computers in Human Behavior, 55*, 113-120.

Monge, P. R., & Contractor, N. S. (2003). *Theories of communication networks*. Oxford University Press.

Nabi, R. L., Prestin, A., & So, J. (2013). Facebook friends with (health) benefits? Exploring social network site use and perceptions of social support, stress, and well-being. *Cyberpsychology, Behavior, and Social Networking, 16*(10), 721-727.

Nooy, W. D., Mrvar, A., & Batagelj, V. (2005). *Exploratory social network analysis with Pajek*. New York: Cambridge University Press.

Pelet, J. E., Ettis, S., Hammami, S., & Schwob, A. (2016). Social networks and online advertising: Should companies promote their brand fan page or their brand website?. In *Marketing Challenges in a Turbulent Business Environment* (pp. 549-562). Springer International Publishing.

Price, L., & Robinson, L. (2017). Being in a knowledge space: Information behavior of cult media fan communities. *Journal of Information Science, 43*(5), 649-664.

Rheingold, H. (2000). *The virtual community: Homesteading on the electronic frontier*. MIT press.

Rice, R. E. (1993). Using network concepts to clarify sources and mechanisms of social influence. In W. D. Richards & G. A. Barnett (Eds.), *Progress in Communication Sciences* (pp. 43-62). Norwood, NJ: Ablex.

Ruiz-Mafe, C., Martí-Parreño, J., & Sanz-Blas, S. (2014). Key drivers of consumer loyalty to Facebook fan pages. *Online Information Review, 38*(3), 362-380.

Taras, V., Rowney, J., & Steel, P. (2009). Half a century of measuring culture: Approaches, challenges, limitations, and suggestions based on the analysis of 112 instruments for quantifying culture. *Journal of International Management, 15*, 357-373.

Walker, M. E., Wasserman, S., & Wellman, B. (1994). Statistical models for social support networks. In Wasserman, S. & Galaskiewicz, J. (eds.), *Advances in Social Network Analysis* (pp. 53-78). SAGE.

Wasserman, S., & Faust, K. (1994). *Social network analysis: Methods and applications*. New York: Cambridge University Press.

Würtz, E. (2005). A cross-cultural analysis of websites from high-context cultures and low-context cultures. *Journal of Computer-Mediated Communication, 11*(1), 274-299.

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