



Influence of Social Factors on the Group Belongingness of Residents in Small Towns and Its Underlying Neural Base

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ABSTRACT

Group belongingness is an emotion that individuals consciously belong to a participating group, which is usually influenced by social factors. Cultivation and development of residents' belongingness is an important factor affecting the sustainable development of small towns. According to the results of the field investigation, we analyze the correlation with the sense of group belonging from the aspects of neighborhood relations, organization construction, cultural construction and mass participation. At the same time, we find that the residents' sense of belonging of the small towns is generally in a low level. A low sense of belonging can lead to changes in the residents' psychological state, manifested as anxiety, depression, loneliness, or even disgust, and the changes involved in the neural basis mainly occur in regions such as the amygdala, prefrontal lobe, cingulate gyrus, and temporo-parietal junction. The research on the social factors that affect the sense of belonging of residents and the discussion on the neural basis will help reveal the intricate connections between different aspects and fully display the internal and external factors and their interactions, so as to effectively guide the spiritual development of small cities and towns.

Key Words: Group Belongingness, Social Factors, Neural Base

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Introduction

According to Marlowe's hierarchy of needs, when a person's physiological needs are met, his/her greatest desire would be love and belongingness. The degree of group belongingness is mainly reflected in the acceptance degree of group members to their group identity, group members' recognition acceptance of group goals and group value norms, association of group members with other members and others, and its establishment is a prerequisite for active and concerted action by groups. As the key point of regional coordinated development, small towns are the greatest potential of urbanization development in the future. Therefore, in order to further promote the new urbanization construction, China's

central government and the State Council released the National New-type Urbanization Plan (2014-2020), which emphasizes that the development of urbanization should take "human urbanization" as the core and Highlight the "people-oriented" principle. Its purpose is to promote the development of social economy with the concentration of the population. The establishment of group belongingness in small towns can give full play to the role of "introducing people" and "retaining people", laying a good foundation for the sustainable development of small towns and and promote the construction of new-type urbanization (Du *et al.*, 2014).

The research on the influencing factors to the residents' group belongingness mostly

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focuses on the external aspect. The American scholars Kasarda and Janowitz used a system model to emphasize that social relations are the important factor affecting residents' group belongingness, and the period of residency is the main factor affecting social relations (Kasarda and Janowitz, 1974). After more than 10 years of studies on the residents' group belongingness, scholars in China have summarized the influencing factors into personal conditions, social network, satisfaction with living space and community participation, etc (Li, 2013), and have been less concerned about the changes in the psychological state and neural basis of residents associated with their belongingness.

In general, residents' group belongingness is a "social-psychological-physiological" phenomenon. Systematic studies can help further understand group belongingness. It is found that such group belongingness can be enhanced by improving the external environment or through effective intervention to the brain nerves of the individuals to relieve their negative emotions.

This paper takes the residents of small cities and towns as the subjects. First, it introduces the social factors affecting the residents' group belongingness, including neighbourhood relations, organizational construction, cultural construction and public participation, and then it discusses the changes in residents' psychological state and the associated neural basis caused by the lack of sense of group belonging, hoping to further facilitate the research on the sense of belonging of the residents in small cities and towns.

Basic situation of investigation

Based on the detailed investigation work of the small towns across the country by Rural Construction Department of Ministry of Housing and Urban-Rural Development of the People's Republic of China, the study selects Chongqing Municipality as the site of the study. And we choose Four different types of twelve small towns as the specific sites, with advantage of regional culture, modern manufacturing and agricultural advantages, industrial advantages and rural tourism advantages (Figure 1).

The study mainly chooses the permanent residents of small towns as the main objects of investigation and a questionnaire investigation is conducted among residents randomly. There are totally 1,200 questionnaires sent out and 1,093 valid questionnaires with 91.08% effective rate.

Among the reviewed residents, the female account for 56.5% while the male for 43.5% (Figure 2).



Figure 1. Sites of Study

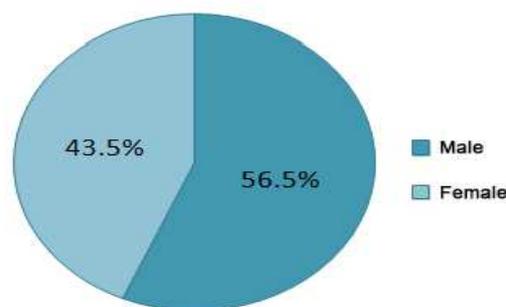


Figure 2. Sex of Interviewed Residents

Residents below the 18 years old stand for 10.2%, residents ranging from 18 to 30 years old stand for 12.8%, those from 31 to 45 years old stand for 20.7%, those from 46 to 60 years old for 25.4% and those above 60 years old for 30.9% (Figure 3). In terms of educational level, residents at and below the primary school account for 47% of the total, those of middle school account for 35.7%, those of high school for 10.3% and those with college education (including junior college) account for 7% (Figure 4). In terms of occupation, residents working in institutions account for 7.9%, those working in enterprises account for 11.3%, those doing business account for 16.7%, those with odd jobs account for 33.6%, peasants account for 11.2%, students for 4%, the unemployed for 5.6%, the retired for 5% and others for 4.7% (Figure 5). In terms of overall sampling situation, the age, educational level and occupation of the interviewed residents are basically compliant with the situation of residents with serious aging population, low educational

level and scattered occupations in small towns of Chongqing, so the samples are typical to some degree.

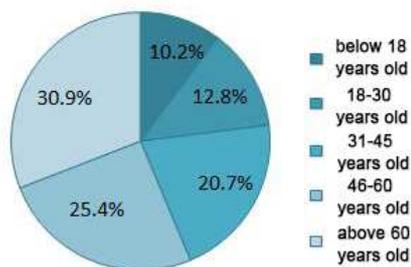


Figure 3. Age of Interviewed Residents

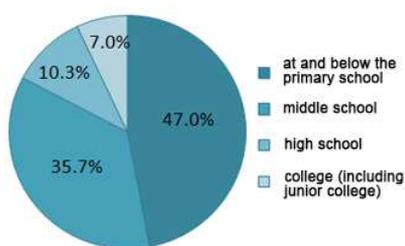


Figure 4. Education level of interviewed Residents

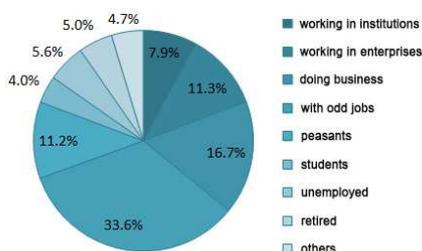


Figure 5. Occupation of Interviewed Residents

The influence of social factors on group belongingness of residents in small towns

Based on the previous research summary, the social environment factors affecting the sense of belonging of the residents are divided into four aspects: neighborhoods, organizational construction, cultural construction, and mass participation. Specific questions are set to understand the social reality in the development of small towns.

Neighborhood relations

Neighborhood relations affect the interaction of residents in small towns with neighbors near their homes, that's, association between individuals and other members of the group in a small town, affecting the residents' love and

attachment to small towns, and also exert a great influence on the construction and development of small towns and communities (Qi and Wang, 1999).

In the Item "Can you live in harmony with your neighbors?" 84.6% residents select "Yes" while only 15.4% residents select "No" (Figure 6); in Item "How many neighbors do you know near the neighborhood?" 71.5% residents select "Most" and 14.6% residents select "All" (Figure 7); moreover, 73.7% residents state that they have three and above friends among neighbors (Figure 8).

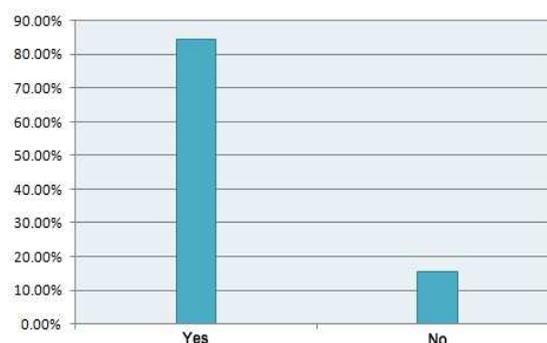


Figure 6. Can you live in harmony with your neighbors?

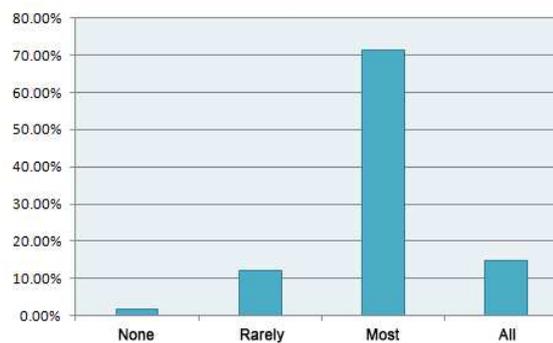


Figure 7. How many neighbors do you know near the neighborhood?

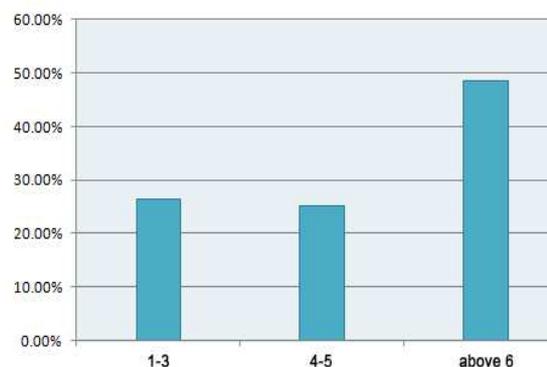


Figure 8. The number of friends in the neighborhood



Organizational construction

Self-government organizations at the grass-roots level play an important role in the construction of small towns. Community (village) neighborhood committees can strengthen the relationship between the party and the government and the masses, and the construction of community (village) residents committee is to exclude difficulties and solve the problems for residents in small towns and realize the service function of the government to residents.

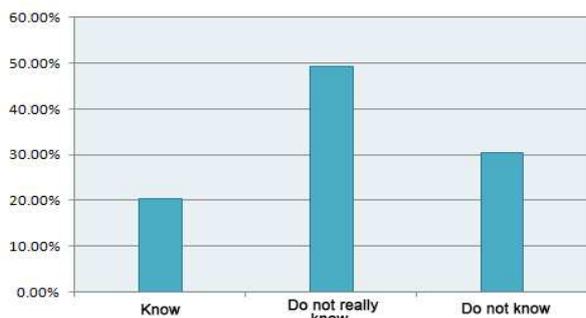


Figure 9. Residents' understanding of community (village)'s functions

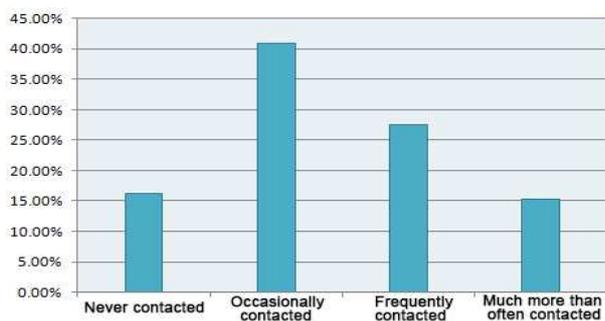


Figure 10. Contact between interviewed residents and community (village) neighborhood committees

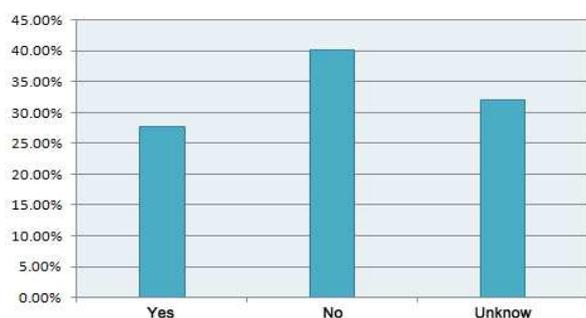


Figure 11. Will residents turn to the neighborhood committee for help if they have difficulties?

In the interview, 49.3% residents don't think they know much about the functions of neighborhood committees and even 30.3% residents think they don't know (Figure 9); in

terms of the degree of closeness between residents and neighborhood committees, 16.3% residents said that they never contacted with neighborhood committees, 40.9% residents said they occasionally contacted, 27.6% residents said they had frequent contact and 15.2% residents said they had contact much more than often (Figure 10); in meeting difficulties, 40.2% residents didn't seek help from community (village) neighborhood committees or governments and 32.1% residents don't know whether they would seek help from neighborhood committees or governments (Figure 11).

Cultural construction

The culture of small towns is a comprehensive reflection of various aspects such as historical traditions, natural environment, mental state, production and lifestyle, folk customs and architectural styles of a region, as well as the most attractive features and soul of small towns (Cheng, 2012). As a historical witness of local cultural spirit and the living embodiment of social evolution, cultural characteristics can not only enhance the local residents' sense of pride and identity, but also raise their group belongingness.

For the Item "How often do you go to the community library and other cultural places to read books and newspapers?" in the Questionnaire, 40.6% residents said that they never went to the community library, 33.3% residents occasionally went, 18.1% residents often went and only 8% residents much more than often went (Figure 12); moreover, a large part of residents hold the indifferent attitude towards the necessity of holding cultural events in small towns and the development of small towns with cultural characteristics, respectively accounting for 52.7% and 42.3% (Figure 13).

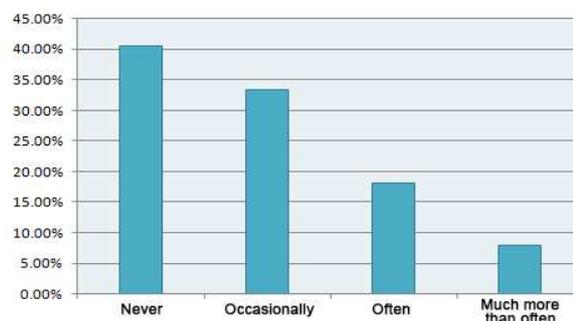


Figure 12. Frequency of Interviewed Residents to Community Libraries



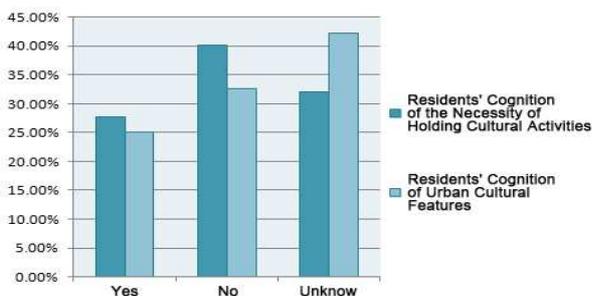


Figure 13. Interviewed Residents' Recognition of Town Cultural Development

Mass Participation

Residents' awareness of participation comes from their recognition and their belongingness of small towns and the participation also in turn affects the group belongingness of residents. The more the residents like and feel satisfied with the small town, the higher recognition, the stronger belongingness and the greater attachment of the small town by residents and thus the more active they would put efforts into the construction of the small town (Du and Su, 2013).

The participation of residents in small towns can be divided into four aspects: political participation (election of village and town cadres), economic participation (government fiscal transparency), cultural participation (educational and cultural activities), and social participation (environmental volunteer activities). The survey shows that the political participation of residents in small towns is significantly more than economic, cultural and social participation, but the overall participation of masses is lower, with 93.7% surveyed residents said that they never understood the government financial revenue and expenditure situation, 78.2% residents didn't participate in educational and cultural activities, and 76.8% residents said they had not participated in environmental protection activities (Figure 14).

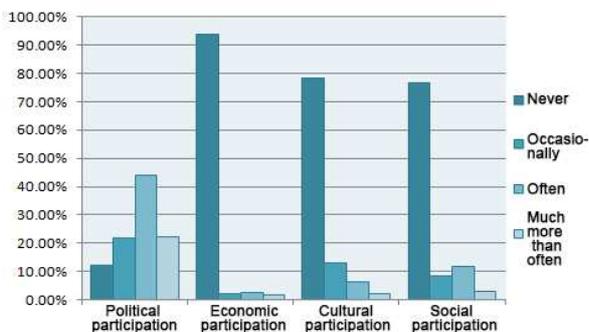


Figure 14. Participation Degree of Masses

Analysis of residents' sense of belonging

Questions at the end of the questionnaire is "Do you have group belongingness in the small town where you live?" 23.3% residents select "Yes", 44.5% residents select "No" and 32.2% residents select "I have no idea" (Figure 15). The data show that the recognition of residents' sense of belonging is relatively low in the selected towns.

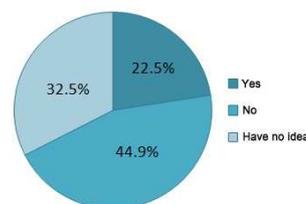


Figure 15. Interviewed Residents' Perception of Group Belongingness

According to the investigation results:

1) Residents in small towns are more closely related and more deeply connected. Frequent exchanges and mutual help between neighbors can enhance the neighborhood relationship of residents, increase the trust and dependence among residents, and enable residents to be satisfied with the group belongingness. However, compared with the low perception of group belongingness of residents in small towns in the whole survey, it is proved that neighborhood relationship has an influence on the overall group belongingness of residents in small towns, but lower than other factors.

2) There is less communication between community (village) neighborhood committees and the residents and residents don't have enough trust in grass-roots organizations, which partly reflects that the construction of grassroots organizations in small towns is inaccurately positioned, leading to the lack of their service functions, reducing the quality of services, and failing to realize the ultimate goal of establishing community (village) neighborhood committees in small towns. Residents lack the care of the government and organizations in their lives, which makes their belongingness lower.

3) As the protectors and carriers of town culture, residents in small towns should have a higher recognition of local culture. However, the survey shows that the demand of residents for cultural construction is not obvious, which indicates that the overall cultural literacy of residents in small town has not reached a high standard, their lack of understanding of the



regional characteristic culture and the general lack of urban culture co-construction awareness also has something to do with the propaganda of the grass-roots organizations. This is also one of the important reasons for the lack of sense of belonging.

4) Mass participation is seen as a basic manifestation of the spirit of social autonomy. Although the participation of the masses has always been the focus of attention in the construction of small cities and towns, according to the survey, the low participation of the residents in small towns is still a fact. Social equity is difficult to achieve. The lack of ownership of small town residents will reduce their sense of belonging.

The neural base of the change of residents' mental status in small towns

The lack of sense of belonging in the community can cause changes in the mental state of residents in small towns. It is a gradual process that mainly manifests itself as anxiety, depression, loneliness, and even disgusted with the environment. At the same time, changes in mental state can cause brain nerve changes.

Anxiety

Anxiety usually arises from fear of the future. It is a disturbed mental state, often manifested as feeling sad, worried and insecure. Sigmund Freud divided anxiety into objective anxiety and neurotic anxiety. The former is a response to real dangers in the environment, while the latter is the result of contradictions in the subconscious mind. Therefore, anxiety is a signal to the person, reminding him/her of the impending danger.

The brain mechanisms and neural circuits of anxious people is one of the hot topics in contemporary neuroscience research. With the help of modern neuroimaging technologies such as electroencephalography (EEG), electromyogram (EMG), magnetic resonance imaging (MRI) and Doppler tissue imaging (DTI), researchers are able to reveal the characteristics of the brain structure and circuits of high-anxiety persons and analyze a series of brain regions that may be associated with the formation and expression of anxiety, including the amygdala, prefrontal lobe and cingulate gyrus, insula, hippocampus, striatum, thalamus, and hypothalamic gyrus (Luo,2011). The main research results are as follows: Bishop proposed that the increase of the anxiety level will also

cause excessive activation of the amygdala and reduce the activity of the prefrontal lobe, suggesting that there is an amygdala-prefrontal-lobe circuit (Bishop,2007); Kim and Whalen *et al.*, used the DTI method to prove there is indeed a direct white-matter pathway between the amygdala and ventromedial prefrontal cortex, and that the integrity of the pathway is negatively correlated with the anxiety level, confirming Bishop's theory (Kim *et al.*, 2011).

Depression

Depression is a kind of mood disorder that seriously harms the physical and mental health of human beings. It is the emotion generated when people experience stress, life setbacks, and painful situations, and is characterized by persistent low mood. In terms of cognition, depression makes people unable to concentrate and results in memory loss, slow thinking, low self-esteem and confidence and low self-assessment. Depressed people often exaggerate their own shortcomings and mistakes. They think that they have no value and that no one cares for them, and also blame themselves and feel guilty. In terms of behaviour, depression makes people sluggish and listless. They are often passive, dependent, and fearful, and unwilling to interact with others.

Current studies have found that brain function changes in depressed people mainly occur in the prefrontal cortex, anterior cingulate, hippocampus, amygdala, thalamus, and basal ganglia. Being widely connected with other brain regions and brain circuits, the prefrontal cortex is thought to play a key role in cognitive and emotional activities. In terms of structure, there are specific connection pathways between the prefrontal cortex and anterior cingulate, hippocampus, amygdala and basal ganglia, and in terms of functional activities, they are closely related and interact an restrict with each other. Any part can directly affect the functions of other brain regions(Liu and Cui, 2007).

Loneliness

Loneliness is the feeling and experience of subjective self-consciousness of being isolated and alienated from others or the society. Living in the society, people have a variety of social needs and form various social relationships. When a certain social need is not met, or when there is a gap between the desire for social relationship and what a person actually has, such person will feel lonely. People in loneliness often feel alone,



depressed, anxious, empty, helpless, indifferent and desperate and are often accompanied by spiritual void.

By comparing groups in high and low loneliness, J.T. Cacioppo and J.P. Mitchell found that the dorsal medial prefrontal cortex and the bilateral temporo-parietal junction participate in the neuromodulation of loneliness (Cacioppo *et al.*, 2009)(Mitchell, 2008). N.I. Eisenberger found that the brain mechanism of social pain caused by loneliness is similar to that of bodily pain, in which the anterior cingulate and the right ventral prefrontal cortex are greatly activated (Eisenberger, 2003).

Disgust

Disgust is a mood of aversion. Usually, it is an unhealthy emotion and an antagonistic state of mind that have accumulated in the long-term unhappy social life, which has serious negative effects on people.

Brain regions related to disgust mainly include prefrontal cortex, orbital area, inferior frontal gyrus, insula and amygdala(Chen, 2017). Sanfey found through an experiment that moral disgust induced by an unfair approach leads to significant activation of the dorsolateral prefrontal cortex, anterior cingulate gyrus, and anterior insula (Sanfey *et al.*, 2003). Moll used text description to invoke the subjects' pure disgust and moral disgust and found that the brain regions activated by the two kinds of disgusts are not completely consistent. Both pure disgust and moral disgust activate the ventral and lateral orbitofrontal cortex, the left inferior frontal gyrus, and the ventral midfrontal gyrus. But the difference is that pure disgust cause higher activation level of the anterior cingulate and right inferior frontal gyrus, etc. than moral disgust, while the situation is the opposite in the left frontal frontal gyrus and left lateral orbitofrontal gyrus, etc. (Moll *et al.*, 2005). Caseras asked subjects to look at pictures that could activate disgust and also neutral pictures. The results showed that the anterior insula, ventrolateral prefrontal cortex, and dorsolateral prefrontal cortex were activated when the subjects saw the aversive images(Caseras *et al.*, 2007). The amygdala is the most important brain region that deals with emotions. A number of studies have shown that the evocation of disgust is accompanied by the activation of the amygdala(Chen, 2017).

Conclusions

The group belongingness is influenced by many factors: From the perspective of neighbourhood relations, the situation is relatively satisfactory, and the good relationship between the neighbourhoods will help improve the sense of belonging of the residents in small towns, but with a lower influence. From the perspective of organizational construction, the disconnection between the public services of the grassroots organizations and the needs of the residents, residents lack organizations that can rely on, has resulted in a serious lack of residents' group belongingness, and their service level needs to be further strengthened. From the perspective of cultural construction, because the overall cultural quality of residents in small towns is lower and the grass-roots government and organizations adopt less propaganda, regional cultural awareness of the residents is lower and it's hard to obtain group belongingness during the protection and promotion of local culture. From the perspective of mass participation, the low level of mass participation has made it difficult for residents to treat themselves as the owner of small towns, thereby reducing their sense of belonging.

The group belongingness of the residents in small towns in a low level, which is a phenomenon that is not optimistic. It is a process from outside to inside that the mental state of the residents in small cities and towns changes to anxiety, depression, loneliness, and even disgust and further leads to changes in the neural basis of the individual brains of the residents. The research on the neural basis related to the sense of group belonging is conducted in the hope of implementing effective intervention from the inside to the outside to reduce negative psychological effects on the residents of small cities and towns, make them more adapted to the social environment and improve their sense of group belonging.

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References

Bishop SJ. Neurocognitive mechanisms of anxiety: an integrative account. *Trends in Cognitive Sciences* 2007; 11(7): 307-16.



- Cacioppo JT, Norris CJ, Decety J, Monteleone G, Nusbaum H. In the eye of the beholder: individual differences in perceived social isolation predict regional brain activation to social stimuli. *Journal of Cognitive Neuroscience* 2009; 21(1): 83-92.
- Caseras X, Mataix-Cols D, An SK, Lawrence NS, Speckens A, Giampietro V, Brammer MJ, Phillips ML. Sex differences in neural responses to disgusting visual stimuli: implications for disgust-related psychiatric disorders. *Biological Psychiatry* 2007; 5(62): 464-71.
- Cheng Q. The Construction Research of Small Town's Cultural: Take the Town of XianRen Du as an Example. *Pioneering with Science & Technology Monthly* 2012; 6: 154-56.
- Du ZB, Su Q, Jiang L. A Structural Model of Residents' Sense of Community in Rural Tourism Destinations and Its Application: A Case Study of Anji County in Zhejiang Province. *Tourism Tribune* 2013; 28(6): 65-74.
- Du ZB, Su Q. Influence of Sense of Community on Community Involvement in Rural Tourism Destination: A Case Study of Anji County in Zhejiang Province. *Tourism Science* 2013; 27(3): 61-71.
- Duan HY. Research on Collaboration in Innovative Methods of Manufacturing Innovation Chain. *Revista Iberica de Sistemas e Tecnologias de Informacao* 2016; E11: 292-303.
- Eisenberger NI, Lieberman MD, Williams KD. Does rejection hurt? An fMRI study of social exclusion. *Science* 2003; 5643(302): 290-92.
- Kasarda JD, Janowitz M. Community attachment in mass society. *American Sociological Review* 1974; 39(3): 328-39.
- Kim MJ, Gee DG, Loucks RA, Davis FC, Whalen PJ. Anxiety dissociates dorsal and ventral medial prefrontal cortex functional connectivity with the amygdala at rest. *Cerebral Cortex* 2011; 21(7): 1667-73.
- Li SG. The study of the sense of community belonging for residents in new small town: Taking hunan liuyang dayao new town for example, M.S. thesis, Dep. Sociology, East China Normal University, Shanghai, China 2013: 1-11.
- Liu JQ, Cui YT. Recent research on the brain structure and functional changes in depression. *China Journal of Health Psychology* 2007; 15(5): 468-70.
- Luo JY. Research progress in neural correlates of emotion and mood disorder. *Military Medical Science* 2011; 35(9): 641-45.
- Mitchell JP. Contributions of functional neuroimaging to the study of social cognition. *Current Directions in Psychological Science* 2010; 17(2): 142-46.
- Moll J, De OR, Moll FT, Ignácio FA, Bramati IE, Caparelli-Dáquer EM. The moral affiliations of disgust: a functional MRI study. *Cognitive & Behavioral Neurology Official Journal of the Society for Behavioral & Cognitive Neurology* 2005; 1(18): 68-70.
- Qi H, Wang XL. Discussion on the integration of urban community from the neighborhood relation of urban farmers and families. *Journal of Huazhong Agricultural University (Social Sciences Edition)* 1999; 1: 36-40.
- Sanfey AG, Rilling JK, Aronson JA, Nystrom LE, Cohen JD. The neural basis of economic decision-making in the ultimatum game. *Science* 2003; 5626(300): 1755-58.
- Wang SS. The Effect of disgust on moral behaviors and its psychological mechanism. M.S. thesis, Dep. Applied Psychology, Tianjin Normal University, Tianjin, China 2017; 1-8.
- Zhang PH, Cheng L. A randomized controlled trial of a neurofeedback-based training for improvement in social phobia disorder. *NeuroQuantology* 2017; 15(4): 133-38.