

Research on the Effect of Herd's Positive Psychological Quality on Energy Saving

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ABSTRACT

Objective: To explore the influence and enlightenment of herd's positive psychological quality on energy saving, and to provide empirical evidence for further targeted interventions to reduce the electricity consumption in the family community. **Method:** From the perspective of social psychology and the positive psychological quality of conformity, this study adopted an experimental intervention of conformity on 60 groups of families in Nanchang City and a follow-up study of their household electricity consumption for four months. By the t-test to explore the impact of herd's positive psychological quality on energy conservation. **Results:** The family group that given the herd experimental intervention produced significant herd behavior. The first group's household electricity consumption increased significantly, and the second group's household electricity consumption decreased significantly. **Conclusion:** The positive psychological factors of the herds can indeed guide the people to save energy, and effectively reduce the electricity consumption of the family community.

Keywords: Conformity; Positive factors; Energy conservation

1. INTRODUCTION

China is the most populous country in the world and the largest developing country in the world. As the pace of social development is faster and faster, energy consumption is getting higher and higher. At the same time, socioeconomic development is also deeply affected by residents' energy consumption. At present, the world is facing the problem of energy resource shortage. The energy consumption caused by social activities is an important factor affecting environmental issues [1]. China, the world's largest population country, accepts more severe challenges. Although China has been advocating "saving energy" and "protecting our only homeland for survival", and has invested a lot of manpower, material and financial resources, but it has achieved little effect, and the electricity consumption of the whole society in the country continues to reach new highs. Our environmental problems have not been fundamentally improved. According to the latest data released by the National Energy Administration, the electricity consumption of the whole society in 2019 is 7.2255 trillion kWh, an increase of 4.5% year-on-year, of which the electricity consumption of urban and rural residents is 1.025 trillion kWh, an increase of 5.7% year-on-year. From the above data, it can be seen that urban and rural residents' electricity consumption in 2019 accounts for 14.19% of social electricity consumption. Therefore, it is more important to guide energy conservation from the perspective of residents' behavior.

Herd psychology, that is, the phenomenon that individuals give up their opinions [2] or violate their own views to keep their speech and behavior consistent with the group under the influence or pressure of the group is called the herd psychology, which is commonly referred to as "following the mainstream" [3]. The masses have a tendency to conform in many ways, mainly reflected in consumption conformity, career selection conformity and behavior conformity [4]. Perhaps in the eyes of the public, conformity is not a good attitude. But everything has two sides, and the herd has both negative and positive sides. We should see the positive side behind the herd from the negative side of the herd [5]. Using this positive psychological quality rationally can make things develop in the direction we need. Some studies have shown that rational herds play an active role in university growth, while blind herds inhibits the development of college students' main body [6]; some research results show that herd theory inspires college counselors to pay attention to role models in practical work.

In summary, this study hopes to use the positive psychological factors of the herd from the perspective of social psychology to try to explore the impact [7] and enlightenment of the positive psychological factors of the herd on energy conservation, and to provide an empirical evidence for further reduce the power consumption of the family community in the future [8].

2. METHODS

2.1. Participants

According to the division of total fiscal revenue of each county in the 2018 National Economic and Social Development Statistical Bulletin of Nanchang City, this

study chose to randomly distribute 100 household questionnaires in Honggutun New District, Xinjian District and Wanli District of Nanchang, and 91 were recovered. The recovery rate reached 91%, and all contact information was left for later tracking. The experiment requires that the number of resident population in each group is 2-6, and the family members cannot be the elderly. In view of this, there are 60 groups of families left after the final screening. The specific demographic information is shown in Table 1.

TABLE 1 Subject Demographic Information (N = 60)

<i>variable</i>	<i>group</i>	<i>number</i>	<i>Proportion (%)</i>
Number of family members	2	11	18.3
	3	16	26.7
	4	15	25
	5	10	16.7
	6	8	13.3
Location of household registration	City	26	43.5
	Rural	34	56.7
Per capita disposable income	Low income	5	8.3
	Lower -middle - income	15	25
	Middle -income	27	45
	Higher -middle- income	10	16.7
	High -income	3	5

^a Note: According to the 2019 national quintile income group, the per capita disposable income of the low-income group is 6,440 yuan, the per capita disposable income of the lower-middle income group is 14,361 yuan, the per capita disposable income of the middle-income group is 23,189 yuan, and the upper-middle income group The per capita disposable income is 36,471 yuan, and the per capita disposable income of the high-income group is 70,640 yuan.

2.2. Procedure

In this study, the participants were randomly divided into three groups. In order to facilitate the follow-up positive psychological quality intervention of these families and to count the per capita electricity consumption of each family every month, I contacted the relevant neighborhood committees and received their vigorous assistance. The

neighborhood committees conducted three different treatments on the three groups of households: the first group of households was informed that the other households in the community used a lot of electricity, the second group of households was informed that the other households in the community used little electricity, and the third group of households as a blank control group. Comparing the monthly average per capita electricity consumption of households in the two months before and after the experimental treatment, the changes in monthly per capita electricity consumption of each

household were counted. The data of this study selects the average monthly household electricity bills for each group of households in the four months from December 2019 to March 2020. The first phase is December 2019 and January 2020. The second phase is February 2020 and March 2020.

2.3. Hypothesis

Based on previous research theories and results, it can be concluded that compliance with correct public opinion, trends, behaviors, and values is a positive follower. This study assumes that herd behavior will have a positive and effective impact on household energy conservation, so three hypotheses are proposed.

Hypothesis 1: The average monthly electricity consumption per capita for the first group of households in the second phase will increase significantly compared to the first phase;

Hypothesis 2: The average monthly electricity consumption per capita for the second group of households in the second stage will be significantly lower than that in the first stage;

Hypothesis 3: The monthly average electricity consumption per capita for the first and second stages of the third group of households has not changed significantly.

2.4. Results and analysis

In order to explore the difference in monthly average electricity consumption per capita between the two phases of the three groups of households before and after the experimental treatment, this study separately conducted a paired sample t test on the average monthly electricity consumption per capita of the three groups in two phases. The results are shown in Table 2.

TABLE 2 DIFFERENCES IN ELECTRICITY CONSUMPTION PER CAPITA BEFORE AND AFTER INTERVENTION

Group	Electricity cost per capita		Difference	t	p	r
	Before intervention	After intervention				
First group	38.5 ±15.77	41.39 ±15.30	-2.86 ±4.46	-2.869**	0.010	0.959
Second group	41.43 ±14.90	37.68 ±13.60	3.75 ±3.56	4.700***	0.000	0.973
Third group	41.82 ±16.99	42.01 ±17.25	- 0.19 ±4.80	0.177	0.861	0.961

Note: *P<0.05, **P<0.01, ***P<0.001

It can be seen from Table 2 that the first group of households: the monthly electricity consumption per capita (38.53 ± 15.77) in the first stage is less than that in the second stage (41.39 ± 15.30), and this difference is significant (t = -2.869, p <0.05); the second group of households: the monthly electricity consumption per capita (41.43 ± 14.90) in the first stage is more than that in the second stage (37.68 ± 13.60), and this difference is statistically significant (t = 4.700, p < 0.001); the third group of households: the monthly average electricity consumption per capita (41.82 ± 16.99) in the first stage is less than that in the second stage (42.01 ± 17.25), but this difference is not significant (t = 0.177, p> 0.05). The correlation coefficients of the two stages of the three groups of families are close to 1, and sig = 0.00, indicating that the correlation between the two stages is very high and the significance is very high. So the three groups of households have the same trend of monthly average electricity consumption per capita in the first and second phases.

3. DISCUSSION

This study finds that when the first group of households is informed that the other households in the community have a lot of electricity, their household electricity consumption will also increase significantly, and the monthly average electricity consumption per capita will also increase significantly. Therefore, hypothesis 1 is verified. This is obviously a passive herd. For households who advocate energy saving in ordinary times, after learning that other households consume more electricity than their own, this kind of saving will be reduced to a certain extent; After extravagant households learn that the electricity consumption of other households is higher than their own, they will feel that everyone's electricity consumption is not low when facing the monthly high electricity bills. At the same time, this study also found that this kind of passive herdsman households with per capita disposable income of middle income and above performed more obviously, probably because households with moderate economic

conditions or better have relatively more electrical equipment. Moreover, the electricity bill can not cause a great financial burden for those households.

However, when the second group of households is informed that the other households in the community have little electricity consumption, their household electricity consumption will also be significantly reduced, and the monthly average electricity consumption per capita will also be significantly reduced. Therefore, Hypothesis 2 is verified. This is exactly the positive follow-up effect that this study wants to verify, no matter what kind of consumption concept these households use for electricity every day, whether they feel burdened by the monthly electricity bill or not, when they know that other households use less electricity, they will use certain methods to control the household's electricity consumption to a certain extent. This behavior can be explained by the psychological "negative bias" effect. The "negative bias" effect is that the brain's response to bad stimuli is stronger and leaves deeper traces than good stimuli. The lower power consumption of other households is a bad stimulus for the home [9]. In addition, this positive herd has a greater and wider impact on the family than the negative herd, especially in households with a median per capita disposable income, which may be because most of these households have a more traditional consumption concept [10], and the electricity bill may give the non-wealthy families have added another expenditure.

The third group of households served as the control group without any intervention. The monthly average electricity consumption per capita of the households in the two stages did not change significantly. Therefore, Hypothesis 3 is verified. However, it can still be seen that the average monthly electricity consumption per capita in the second phase is higher than that in the first phase. This may be due to the impact of the new type of corona pneumonia virus epidemic. People can not go out at will during the epidemic.

4. CONCLUSION

This study combines the herd effect and positive psychology to carry out research. The results show that the herd's positive psychological factors can indeed lead the people to actively guide energy conservation, thereby effectively reducing the power consumption of the family community. It can be known from many previous studies that there are many influencing factors of herd [11], which can be roughly divided into individual factors, group factors and situation factors [12]. Based on this, the author starts from these three aspects and puts forward the following suggestions.

First of all, from the perspective of individual factors, the level of self-involvement and knowledge experience of an individual to an event can largely influence the herd. Relevant departments can allow the masses to become more deeply involved in advocating green travel and energy conservation and emission reduction policies, such as using online and offline methods for real-name mass supervision, public opinion and other activities. Once the

individual's attitude is publicly expressed, people will be more aware of their position deep in their hearts [13], and people with high active participation can enjoy some conveniences and preferential policies in life services to mobilize their enthusiasm. Meanwhile, knowledge promotion of energy saving and emission reduction should also be strengthened so that the concept of green life can be deeply rooted.

Secondly, in terms of group factors, the consistency of the group and the authority of the group members directly determine whether the individual will produce herd behavior. Generally speaking, the group should not be too large, and too large can easily lead to decentralized responsibilities. You can use the community or community as a unit, because members of the same community or community have many common points and common interests. Therefore, the relevant property management personnel can provide some property conveniences to families with less electricity consumption per capita, such as providing priority property services [14]. In addition, it is possible to persuade the prestigious members of the herd to actively disclose the electricity consumption of the family internally, and actively guide the masses to practice the concept of energy saving.

Finally, in the general environment in which we live, what we see seems to be how many billions of kilowatt-hours of electricity consumption in a certain quarter of a year, a year-on-year increase of a few percent. It seems that such growth can reflect the development and progress of society. Not contrary to advocate energy saving and emission reduction. Therefore, what the relevant departments need is not to vigorously render the great consumption of energy, but to talk about the rapid energy consumption speed, so that humans have a sense of crisis and understand the severity of energy challenges.

REFERENCES

- [1] Yue Ting, Long Ruyin, Chen Hong, The optimal CO2 emissions reduction path in Jiangsu province: An expanded IPAT approach [J]. *Applied Energy*, 2013, 112: 1510-1517.
- [2] Zhao Yubao, Zhang Qian, Feng Xiaohua, Enlightenment of the herd theory to the work of college counselors [J]. *Journal of Northeast Normal University (Philosophy and Social Sciences Edition)*, 2011 (04): 277-279., In Chinese.
- [3] Jessica M. Nolan, Normative Social Influence is Underdetected. 2008, 34(7):913-923.
- [4] P. Wesley Schultz, Jessica M. Nolan, Robert B. Cialdini, et al, The Constructive, Destructive, and Reconstructive Power of Social Norms: Reprise. 2018, 13(2):249-254.

- [5] Zhang Jiahui, Using herd psychology to improve the effect of ideological and political education of college students [D]. Harbin Engineering University, 2014., In Chinese.
- [6] Cheng Yan, Herd behavior and guidance of young students [J]. Journal of Liaoning Education Administration College, 2005 (09): 51-53.,In Chinese.
- [7] Sun Yong, Zeng Fanwu, Talking about the rational use of "conformity psychology" [J]. Liaoning Education, 1995 (09): 20-21.,In Chinese.
- [8] Ling Shihua, The application of the positive effect of "conformity psychology" in the class management of elementary school teacher [J]. Journal of Guangxi Education Institute, 2016 (06): 167-169.,In Chinese.
- [9] Ainiwaal Ahemat, Geng Zhi, Saifing Aibai, Using positive factors of herd psychology to construct college students 'organizational culture [J]. Journal of Hetian Teachers College, 2013, 32 (04): 106-108.,In Chinese.
- [10] Zhou Guohong, Liu Lihao, Xu Hongfei, Influencing factors of quality consumption behavior of urban residents [J]. Urban Issues, 2019 (10): 98-103.,In Chinese.
- [11] Guagnano G A, Stern P C, Dieta T, Influences of Attitude-behavior Relationships: A Natural Experiment with Curbside Recycling [J] . Environment and Behavior, 1995(5): 699-718.,In Chinese.
- [12] Pan Bao et al, Research on Consumer Values under the Background of Chinese Culture——Scale Development and Comparison [J]. Management World, 2014 (4): 90-106. ,In Chinese.
- [13] Ye Dezhu etc. Consumer Culture, Cognitive Deviation and Consumer Behavior Deviation [J]. Economic Research, 2012 (2): 80-92. ,In Chinese.
- [14] Wang Guangqiang, Difference Analysis of Influencing Factors of Energy Consumption Behaviors of Urban and Rural Residents in Jiangsu Province and Research on Management Countermeasures [D]. China University of Mining and Technology, 2017. ,In Chinese.