Awe Expands Perception of Time, Alters Decision Making and Life Satisfaction

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Abstract: Time might be the scarcest commodity for many people in modern life. People increasingly report feeling time starved, and that feeling exacts a toll on health and well-being. Three experiments showed that participants who felt awe, relative to other emotions, felt they had more time available and were less impatient. Participants who experienced awe also were more willing to volunteer their time to help other people, more strongly preferred experiences over material products, and experienced greater life satisfaction. Mediation analyses revealed that these changes in decision making and well-being were due to awe's ability to alter the subjective experience of time. Experiences of awe bring people into the present moment, and being in the present moment underlies awe’s capacity to adjust time perception, influence decisions, and make life feel more satisfying than it would otherwise.

1. Introduction

People always feel the preciousness of time and want to seize the time in real life, even leading to “time famine”. The psychological research (Rud, Vohs, & Aaker, 2012) shows people’s subjective sense of happiness is reduced due to time pressure and rapid pace of life. Their physical and mental health is affected and they even suffer physical and mental impairment, resulting in weak social development. On that basis, people keep seeking the method to change their subjective perception of time when the irreversible time goes by, and finding the way to make people feel time is sufficient.

In recent years, studies on awe of moral emotion are increasing. Some studies (Shiota, Keltner, & Mossman, 2007) believe awe is a kind of useful and characteristic emotion, involving two physiological components of magnitude perception and mental adjustment demands. The two intertwining components urge people to change current perception or common explanation method and form new psychological cognitive scheme. According to the Extended-now Theory (Vohs & Schmeichel, 2003), when people focus on now, the time they feel will be longer or more. The experience of awe shows people’s focus on current objects. Thus, it is reasonable to infer that the experience of awe will affect the perception of time length. Socioemotional Selectivity Theory (Carstensen, Isaacowitz, & Charles, 1999) believes when people fee sufficient time, they will be motivated to acquire new knowledge.

Psychological researches found the insufficient time is the excuse that people often use to explain why they did not help people in need (Strober & Weinberg, 1980); insufficient time is also the excuse that people use to explain why they participate in less activities to improve sense of happiness (Thoits & Hewitt, 2001). Time perception could even make people more prefer spirit than materials (Van Boven & Gilovich, 2003); moreover, such preference mode could obviously improve the sense of happiness (Zhong & Mitchell, 2010). The frequent sense of time stress will lower the life satisfaction of people (Robinson & Godbey, 1997). The extreme lack of time will even lead to depressive symptoms (Roxburgh, 2004).

To sum up, this paper plans to affect the time availability perception of the subject by manipulating the experience of awe, so as to further affect subsequent moral behavior and subjective evaluation.
2. Experiment I: Sense of awe, happiness and time availability perception

This experiment plans to discuss whether the sense of awe could affect the perception of people for time availability, i.e., people feel time is sufficient.

2.1 Subjects

The subjects are 70 college students selected at random from public area of campus, including 32 males and 38 females with average age of 21.8. All of them volunteer to participate in.

2.2 Methodology

All subjects are divided to two groups at random, sense of awe startup group and sense of happiness startup group, after finishing sentence making with disordered phrases. They are required to finish evaluating TV screen quality of three projects, time availability perception and current state of mind successively.

2.3 Results and analysis

Statistical results show, after the task of sentence making with disordered phrases, the mean point of feel of time urgency of subjects is 5.35, obviously higher than the intermediate value 4; \( t \) (68) = 2.46, \( p < 0.05 \), \( d = 0.59 \), converting to 2.56 of the value similar to scoring method of time availability perception scale. It means under the startup condition of time urgency sense, subjects experienced tense time urgency.

The operation effectiveness of experiment for subjects’ emotion startup can be seen in Table 1.

| Experiment condition      | Awe       | Happiness |
|---------------------------|-----------|-----------|
| Startup of sense of awe   | 6.11±1.03 | 4.15±1.12 |
| Startup of sense of happiness | 3.79±1.21 | 5.78±0.95 |

T inspection results in Table 1 show under the startup conditions of sense of awe, the average score of subjects’ experience of awe is obviously higher than the under the startup conditions of sense of happiness, \( t \) (68) = 3.11, \( p < 0.01 \), \( d = 0.74 \); under the startup conditions of sense of happiness, the average score of subjects’ happiness experience is obviously higher than that under startup conditions of sense of awe, \( t \) (68) = 2.58, \( p < 0.05 \), \( d = 0.51 \). However, the average scores of experience of other six emotions have no obvious difference under different startup conditions (\( p > 0.05 \)). It means, different experiment startup operations are effective; the startup of sense of awe make subjects experience awe strongly, and the startup of sense of happiness allows subjects experience happiness greatly.

The scores of subjects’ time availability perception under different experiment startup conditions can be seen in Table 2.

| Time availability perception | Startup of sense of awe | Startup of sense of happiness |
|------------------------------|-------------------------|------------------------------|
|                              | 3.41±1.32               | 2.45±1.18                    |

According to T inspection results, under the startup condition of sense of awe, the average score of subjects’ time availability perception is obviously higher than that under startup conditions of sense of happiness, \( t \) (68) = 2.47, \( p < 0.05 \), \( d = 0.45 \); also higher than that of the conversion value of time urgency, \( t \) (68) = 2.34, \( p < 0.05 \), \( d = 0.42 \). Further statistics and inspections show the time availability perception is of significant positive correlation with the sense of awe (\( r = 0.38 \), \( p < 0.01 \)), and of positive correlation with sense of happiness but not obviously (\( r = 0.19 \), \( p > 0.05 \)). It means subjects experienced awe believed the time is plenty, and their sense of time urgency is lowered clearly.
3 Experiment II Perception of awe and time availability and moral behavior

This paper plans to verify whether the experience of awe could affect time availability perception as well and affect subsequent moral behaviors.

3.1 Subjects

The subjects are 60 college students selected at random from public area of campus, including 28 males and 32 females with average age of 20.5. All of them volunteer to participate in.

3.2 Methodology

The experiment tasks are divided to two stages. In the first stage, the task is to recall a period of awe or happiness experience, and describe in 5-10min; in the second stage, the task is self experience evaluation.

3.3 Results and analysis

The score of each item of evaluation under different experimental conditions can be seen in Table 3.

| Experimental conditions | Awe     | Happiness | Impatience | Volunteering intention | Donation intention |
|-------------------------|---------|-----------|------------|------------------------|--------------------|
| Condition of experience of awe | 4.51±1.78 | 4.03±1.25 | 3.89±1.61  | 5.51±1.28              | 4.92±1.45          |
| Condition of experience of happiness | 3.01±1.55 | 4.92±1.33 | 4.67±1.51  | 4.81±1.26              | 4.67±1.29          |

The results of T inspection and analysis show the average score of experience of awe of subjects under the condition of awe experience is obviously higher than that under conditions of happiness experience, \( t(58) = 2.95, p < 0.01, d = 0.86 \); the average score of subjects’ experience of happiness under conditions of happiness experience is greatly higher than that under conditions of awe experience, \( t(58) = 2.95, p < 0.01, d = 0.86 \). There is no obvious difference of excitement and pride under different experience conditions (\( ps > 0.05 \)). It means operations of experimental conditions are effective.

The average score of impatience of subjects under the conditions of awe experience is obviously lower than that under happiness experience conditions, \( t(58) = 2.71, p < 0.01, d = 0.66 \), showing the impatience is lowered greatly by the awe experience.

For voluntary activities spent much time, the average score of intention of subjects under awe experience conditions is remarkably higher than that under happiness experience conditions, \( t(58) = 2.31, p < 0.05, d = 0.49 \). For donation which needs not spent time, the average score of intention of subjects under awe experience conditions has no notable difference with that under happiness experience conditions (\( p > 0.05 \)). It means the experience of awe could effectively affect the moral behavior intention with regard to time costs, while not affect moral behavior without time cost.

This paper inspects the mediating effects of impatience one by one (see Table 4) in three steps. The first is the regression of volunteering intention to emotional experience, and the regression equation is obvious (\( p < 0.05 \)); the second step is the regression of impatience to emotional experience, and the regression equation is obvious (\( p < 0.01 \)); the third step is the regression of volunteering intention to emotional experience and impatience, and the regression equation is obvious; in which, the regression coefficient of impatience is obvious (\( p < 0.01 \), while of emotional experience is not notable (\( p > 0.05 \)). Since results of all the inspections are remarkable, the mediating effect of impatience to emotional experience and volunteering intention is obvious. However, the fourth \( t \) inspection is not obvious. Thus, it is complete mediating effect.
Table 4. Inspection of impatience’s mediating effect.

| Step 1 | y = 0.67x | \( t = -2.49^* \) |
| Step 2 | w = -0.72x | \( t = -2.35^* \) |
| Step 3 | y = -0.55w + 0.21x | \( t = 3.67^{**} \) |

Note: y refers to volunteering intention, x refers to emotional experience, w refers to impatience; * means \( p < 0.05 \), ** means \( p < 0.01 \).

4. Experiment III: Awe, decision making and life satisfaction

This paper plans to discuss whether the experience of awe could affect behavior decision making and life satisfaction of people through experiment.

4.1 Subjects

The subjects are 120 college students selected at random from public area of campus, including 55 males and 67 females with average age of 20.8. All of them volunteer to participate in.

4.2 Methodology

Subjects are divided to different mental experience recalling groups. The recalling scenario of the awe experience group is the experience of awe undergone when thinking of outstanding capacity, charm or talents of others, while the subjects in the control group should recall contents of recent classes. All subjects are asked to describe the experience scenarios in writing in 5-10min, and then finish series of questionnaire. The questionnaire contains time availability perception scale, current life satisfaction scale and behavior decision making scale. In the end, they are asked to carry out self evaluation on their current state of mind, involving seven emotions of anxiety, relaxation, worry, awe, sadness, boring and fear.

4.3 Results and analysis

The subjects’ score of all evaluation items under the two experimental conditions can be seen in Table 5.

Table 5. Statistical table of average self evaluation score under different experimental conditions (\( M \pm SD \)).

|          | Awe       | Time perception | Life satisfaction | Behavior decision making (%) |
|----------|-----------|-----------------|-------------------|-----------------------------|
| Awe group| 4.75±1.85 | 3.85±1.32       | 5.62±1.27         | 67.37±23.55                |
| Control  | 3.11±1.43 | 3.03±1.15       | 4.71±1.42         | 53.54±22.36                |

T analysis results show the average score of awe experience in the awe experience group is remarkably higher than that in the control group, \( t (118) = 3.33, p < 0.01, d = 0.87 \); under different experimental conditions, the average scores of other six emotions have no obvious difference (\( ps > 0.05 \)). It means the operation of experimental condition is effective.

The average score of time availability perception of the subjects in the awe experience group is remarkable higher than that in the control group, \( t (118) = 2.81, p < 0.01, d = 0.56 \). The result shows subjects experienced awe feel time is more sufficient.

The average score of current life satisfaction of subjects in the awe experience group is notably higher than that in the control group, \( t (118) = 2.69, p < 0.01, d = 0.52 \). It means subjects who experienced awe have higher life satisfaction.

This paper inspects the mediating effects of time availability perception one by one (see Table 6). The first is the regression of life satisfaction to awe experience, and the regression equation is obvious (\( p < 0.01 \)); the second step is the regression of time availability perception to awe experience, and the regression equation is obvious (\( p < 0.01 \)); the third step is the regression of life satisfaction to awe experience and time availability perception, and the regression equation is
obvious, in which, the regression coefficient of time availability perception is remarkable \((p < 0.01)\), while the regression coefficient of awe experience is not \((p > 0.05)\). Since results of all inspections are obvious, the mediating effect of time availability perception to awe experience and life satisfaction is obvious. However, the fourth \(t\) inspection is not obvious. Thus, it is complete mediating effect.

| Step | Standard equation | Regression coefficient inspection |
|------|-------------------|----------------------------------|
| Step 1 | \(y = 0.75x\) | \(t = 2.85^{**}\) |
| Step 2 | \(w = 0.71x\) | \(t = 2.74^{**}\) |
| Step 3 | \(y = 0.56w + 0.24x\) | \(t = 2.67^{**}\) |

Note: \(y\) refers to life satisfaction, \(x\) refers to awe experience, \(w\) refers to time availability perception; * means \(p < 0.05\), ** means \(p < 0.01\).

The proportion of spiritual consumables selected by subjects in the awe experience group \((67.37\%)\) is obviously higher than that \((53.54\%)\) in the control group, \(t (118) = 2.18, p < 0.05, d = 0.48\). The finding shows subjects who experienced awe more prefer to select products regarding spirit.

This paper inspects the mediating effects of time availability perception one by one (see Table 7). The first is the regression of behavior decision making to awe experience, and the regression equation is obvious \((p < 0.01)\); the second step is the regression of time availability perception to awe experience, and the regression equation is obvious \((p < 0.01)\); the third step is the regression of behavior decision making to awe experience and time availability perception, and the regression equation is obvious; in which, the regression coefficient of time availability perception is remarkable \((p < 0.01)\), while the regression coefficient of awe experience is not \((p > 0.05)\). Since results of all inspections are obvious, the mediating effect of time availability perception to awe experience and behavior decision making is obvious. However, the fourth \(t\) inspection is not obvious. Thus, it is complete mediating effect.

| Step | Standard regression equation | Regression coefficient inspection |
|------|-----------------------------|----------------------------------|
| Step 1 | \(y = 0.89x\) | \(t = 3.21^{**}\) |
| Step 2 | \(w = 0.73x\) | \(t = 2.76^{**}\) |
| Step 3 | \(y = 0.63w + 0.19x\) | \(t = 2.70^{**}\) |

Note: \(y\) refers to behavior decision making, \(x\) refers to awe experience, \(w\) refers to time availability perception; * means \(p < 0.05\), ** means \(p < 0.01\).

5. General discussion

The results of three experiments prove each other and show on consensus that the emotion of awe, relative to other positive or neutral emotions, could effectively change the perception of people for time availability, and allow people prone to believe time is more sufficient. On the basis of such internal and changed time perception, the cognition, behavior and decision making with regard to time, such as voluntary activity, production consumption tendency and current life satisfaction, are affected.

The research findings enlighten us that, firstly, the sense of awe may be an important base point for people’s moral practices and life practices, and the emphasis on cultivation of sense of awe will help social development and human civilization progress; secondly, the emphasis on cultivation of sense of awe will help change people’s social cognition mode and daily life style, and improve their living standard and subjective well-being; thirdly, the emphasis on cultivation of sense of awe will
help improve people’s perception of time and improvement of spirit well-being, and enhance people’s physical and mental health, which is particularly important in the rapid transformation period of China at present; fourthly, the induction approaches and ways for the awe emotion proved in experiments provide effective methods or references, such as self mental experience, natural landscape cultivation, aesthetic education and the model effect of others, to cultivation of sense of awe.

Without doubt, we should see multifold effects of the sense of awe. For instance, the experience of awe may go against the self adaptation of people for current attention. Thus, we wish in the future more studies could deeply discuss the psychological structure and process of awe, and the unique psychological mechanism of awe affecting cognition and behaviors of people.

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