

Weather, Mood And Helping Behavior : A Comparative Study Between Two Indian Cities (Chennai And Mysore)

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ABSTRACT:

The present study examined differences in helping behavior and moods under distinct temperature and humidity conditions in naturalistic settings. The study was quasi-experimental in nature comparing helping behavior between individuals in two cities (Chennai and Mysore) in India that significantly differed in weather conditions. In order to control for extraneous variables, the study was conducted in zoological parks in each city. Purposive Sampling was employed to collect data from 50 adults in each city. Results revealed a significant negative relationship between temperature and positive affect, whereas a significant positive relationship was found between negative affect and temperature. Such a finding led to mood being considered as the control variable in this study. Consequently, partial correlation exposed a significant positive relationship between temperature and helping behavior.

Key word: Weather, Mood, Helping behaviour, Comparative

INTRODUCTION

Weather has been observed to influence human lives in more ways than one. Human health, birth rates, mortality rates, emotional wellbeing as well as short-term changes in mood, and certain deviations from normal behaviour are related to various meteorological variables. Research exploring the link between weather and a social activity has reported that higher temperatures are correlated with increases in violent assaults and homicides (Cohn, 1990a, 1990b). Researchers have also found that the number of suicides rise with increases in barometric pressure and with decreases in wind (Barker, Hawton, Fagg & Jennison, 1994; Stoupel, Abramson & Sulkes, 1999; Lester, 1970). In addition, results from several laboratory studies show that artificial

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sunlight reduces Seasonal Affective Disorder (SAD) symptoms for the majority of SAD and non-SAD depressed participants (Kripke, 1998; Stain-Malmgrem, Kjellman & Aberg-Wistedt, 1998).

Weather has long held a central place in human experience and continues to be an important determinant of everyday mood and behavior in modern life (Persinger, 1980; Watson, 2000). The effect of weather on human emotion and social interactions is well supported in literature. It has been shown that weather has both daily and seasonal effects on mood. It is associated with productivity levels, emotional crises, hostility, memory, and cognition (Barnston, 1988; Denissen, Penke, Butalid & van Aken, 2008; Dubitsky, Webber & Rotten, 1993; Keller et al., 2005; Persinger, 1975).

The role of mood in helping behavior has also been the focus of social research. Negative emotions such as sadness and guilt have a significant influence on helping behavior (Harris, Benson & Hall, 1975; Cialdini, Eisenberg, Shell & McCreath, 1987; Small & Verrochi, 2007). Happiness increases charitable behavior (Isen & Levin, 1972). Aderman (1972) induced mood states in participants and found that people in a positive mood were more likely to help. Positive mood states – such as the feeling of success – were also found to be related to prosocial behavior in children (Isen, Horn, & Rosenhan, 1973).

Considering the well documented research into the relationship between weather and mood as well as mood and helping behavior, the present research was an attempt to study the relationship between weather and helping behavior with mood as the control variable in two cities.

We define *mood* as transient episodes of affect and *mood valence* as the extent to which an individual feels good. *Temperature* and *humidity* are considered as measures for weather.

Helping behavior is defined as action intended to provide assistance.

Theoretical Background

2.1. Influence of weather on mood

Substantial research in psychology has confirmed that weather can influence an individual's mood. For instance, Persinger and Levesque (1983) examined the effects of temperature, relative humidity, wind speed, sunshine hours, barometric pressure, geomagnetic activity and precipitation on a unidimensional mood rating scale. They found that 40% of mood evaluations were accounted for by a combination of meteorological events; in particular, barometric pressure and sunshine had the strongest impact on mood. Other researchers employing varying mood scales have found that

low levels of humidity (Sanders & Brizzolara, 1982), high levels of sunlight (Cunningham, 1979; Parrott & Sabini, 1990; Schwarz & Clore, 1983), and high temperature (Cunningham, 1979; Howarth & Hoffman, 1984) are associated with positive mood.

Therefore,

H1 : Temperature would be significantly related to mood

H2 : Humidity would be significantly related to mood

H3 : There would be a significant difference in the mood of individuals in Chennai and those in Mysore

2.2. Influence of weather on helping behavior

Helping is a social behaviour that is found to vary as a function of the mood or emotional state of the individual (Cunningham, Steinberg & Grev, 1980). If the weather affects individuals' emotional state or sense of well-being, then it might be expected to affect helping, and two studies tentatively suggested such a relationship. Lockard, McDonald, Clifford, and Martinez (1976) reported that panhandlers were more successful in spring than in autumn, and Cialdini, Vincent, Lewis, Catalan, Wheeler, and Darby (1975) footnoted a similar observation. Neither study, however, connected a specific weather variable to an increase in helping. Cunningham (1979) assessed the impact of a variety of weather, climatic and air quality indicators on helping using two different indices. The first study, concerned with helping an interviewer, was initially conducted outdoors during the late spring and summer and was subsequently replicated during the winter. The second study involved restaurant tipping, and data were collected indoors during the early spring. Temperature was found to be a significant predictor of helping and consistent with predictions, temperature was negatively associated with helping in the summer and positively related to helping in the winter. Another predicted significant association found in both the studies was a negative correlation between relative humidity and helping. People were more likely to be helpful when the humidity was low than when the humidity was high.

Therefore,

H4 : Temperature would be significantly related to helping behaviour

H5 : Humidity would be significantly related to helping behaviour

H6 : There would be a significant difference in the helping behaviour of individuals in Chennai and those in Mysore.

2.3. *Mediating effect of mood on helping behavior*

Previous research has demonstrated that weather influences behavior and that mood can mediate such effects (e.g., Barker et al., 1994; Cao & Wei, 2005; Cohn, 1990a, 1990b; Cunningham, 1979; Kamastra, Kramer & Levi, 2003). Implicit in such research is a three stage model with the following elements: (1) weather variables, (2) mood and (3) behaviour. These authors have suggested that the weather variables affect an individual's emotional state or mood, which creates a predisposition to engage in particular behaviours.

Research has suggested that negative emotions, such as sadness and guilt have a significant influence on helping behaviour (Harris et.al., 1975; Cialdini et al., 1987; Small & Verrochi, 2007). Cialdini and Kenrick (1976) contended that negative moods lead just as much toward helping behaviours as positive mood, if not more so. This is because of the desire to relieve oneself from the negative mood. This is called the Negative State Relief Hypothesis (Baumann, Cialdini, & Kenrick, 1981). Positive affect in terms of happiness was found to increase charitable behavior (Isen & Levin, 1972). In Aderman's (1972) experimental study different mood states were induced among participants and it was observed that people in a positive mood were more likely to help.

Therefore,

H7 : Mood would be significantly related to helping behavior

H8 : Temperature would be significantly related to helping behaviour, while controlling for mood

H9 : Humidity would be significantly related to helping behaviour, while controlling for mood

2.4. *Influence of age on mood and helping behavior*

In Cialdini and Kenrick's (1976) experiment, negative mood states were found to affect individuals' helping behaviour differently according to age. Suppression of generosity was evident in younger individuals, while enhanced generosity was displayed in older individuals. Cunningham (1979) found significant negative relationship between age and helping behavior during summer. Due to contradictions in previous studies, a null hypothesis was adopted in the present research.

Therefore,

H 10 : Age would not be significantly related to mood

H 11 : Age would not be significantly related to helping behavior

2.5. Influence of gender on mood and helping behavior

A key feature of mood states is their transient temporal nature (Luomala & Laaksonen, 2000) and their ability to greatly affect a person's perspective, judgments and future behaviour. Martin (2003) however suggests that mood states can override gender predispositions given the personal idiosyncrasies of the individual being studied. Gender research in the past has been extensive and incongruous pertaining to helping behaviour. Results from a meta-analytic review (Eagly & Crowley, 1986) of sex differences in 172 studies (appended) in helping behavior indicate that in general men helped more than women and women received more help than men. Nevertheless, sex differences in helping were inconsistent across studies.

Therefore,

H 12 : There would be no significant gender differences in mood

H 13 : There would be no significant gender differences in helping behavior

The literature reviewed above provides support for the effect of weather on mood, the effect of weather on helping behaviour and the mediating effects of mood on helping behaviour. In addition, the influence of age and gender on mood and helping behaviour were also briefly reviewed and relevant hypotheses for the present study were thereby formulated.

METHOD

Although temperature can be easily manipulated, controlling humidity, barometric pressure, wind velocity, and amount of sunshine in a factorial design seemed unfeasible. A compromise was reached by adopting a quasi-experimental design in which uncontrolled variations in specific weather parameters would systematically observed and related to changes in the measured dependent variable, helping behavior. Being a comparative study, the researchers chose to conduct the present research in zoological parks in the two cities, in order to ensure similar unregulated outdoor environmental conditions.

The cities chosen differ significantly in terms of temperature and humidity and have been found to experience distinct climates (i.e. Semi - arid climate and Tropical wet and dry climate). Due to such differences in daily weather conditions, the two cities, namely Mysore and Chennai, were selected for the present study.

Participants

Visitors to zoological parks on the days of data collection in Chennai (n=50) and Mysore (n=50) were included as the sample for the study. Use of a relatively larger sample size ensures the results of the study to be less vulnerable to sampling error. Convenience

sampling procedure was used to collect data. However, only individuals who were legal adults, 18 years or older, and those who could read, write and understand English were allowed to participate in the present study. These criteria were decided upon so as to enable the participants to provide valid and accurate responses to the questionnaire given. As one of the participants did not meet the above criteria she was deemed ineligible to participate in the present study. Subsequently the sample comprised of 50 males and 49 females. The age range of the sample was 18 to 62 years.

MEASURES

Mood was measured using the Positive and Negative Affect Schedule (PANAS; Watson, Clark & Tellegen, 1988) which comprises two mood scales, one assessing positive activation and the other measuring negative activation. This scale was used in order to obtain largely independent scores for positive and negative affect. Each scale consists of 10 items. Each item is rated on a 5point scale ranging from 1=very slightly to not at all to 5 = extremely to indicate the extent to which the respondent feels this way at the present moment. Reliability and Validity reported by Watson, Clark & Tellegen (1988) was moderately good. For the Positive Affect Scale, the Cronbach alpha coefficient was 0.86 to 0.90; for the Negative Affect Scale, 0.84 to 0.87. Over a 8-week time period, the test-retest correlations were 0.47-0.68 for the PA and 0.39-0.71 for the NA. The PANAS has strong reported validity with such measures as general distress and dysfunction, depression, and state anxiety. We subtracted Negative Activation from Positive Activation to create a single measure of *mood valence*, with higher scores denoting better mood (see Barrett & Russell, 1998, for justification of this rotation). Creating a single score would support the implicit assumption of bipolarity of affect.

Helping behavior was quantified by the number of questions the participant was willing to answer for the experimenter as a response to a request made by her (see Cunningham, 1979, for justification of this measure). This measure was found to be suitable as participants do not generally prefer filling out multiple or lengthy questionnaires as they are time consuming. Use of this measure therefore allowed the researchers to seek more voluntary participants as well.

Weather was measured using readings of temperature and humidity which were taken at the beginning of the hour at which the participants were approached. These data were taken from www.accuweather.com and later reconfirmed with the respective city meteorological departments. The main focus of related experimental studies was to examine the effect of temperature and humidity on behaviour (Bell & Baron, 1976; Palamerek & Rule, 1978; Bell, 1981). Due to the focussed nature of the relevant studies reviewed (Keller et al., 2005 and Watson, 2000), the authors agreed to consider only two weather parameters.

PROCEDURE

The participants were not told about the purpose of the study initially as it would influence their responses. The measure of helpfulness was obtained by approaching the passersby with the statement:

Hi, I'm a student from the University of Madras and we're conducting a survey of social opinions. Although the survey is 80 questions long, you don't have to answer all the questions. How many questions would you be willing to answer for me?

The number of questions the participant was willing to answer was employed as an interval measure of helping. After getting their consent to participate in the study, the PANAS questionnaire was administered to them. Instructions were given about how they should answer the questions and they were given enough time to answer them. Participants were then debriefed about the objectives of the study.

RESULTS AND DISCUSSION

Pearson's correlation was used to assess relationship between age, temperature and humidity with mood valence and helping behavior. Age was not significantly related

Table 1. Mean scores and standard deviations of age, weather, mood and helping behaviour scores

	CHENNAI				MYSORE			
	N	Range	Mean	S.D.	N	Range	Mean	S.D.
Age	49	45	29	10.01	50	8	33.52	9.024
Weather								
Temperature	49	7	36.55	2.76	50	8	28.8	2.814
Humidity	49	23	45.8	7.54	50	34	57.2	12.8
Mood								
Positive Affect	49	28	33.73	7.702	50	38	36.58	7.916
Negative Affect	49	24	18.67	6.609	50	32	16.16	6.329
Helping Behaviour	49	78	22.14	23.585	50	77	21.24	18.732

Table 2. Correlation between age, weather, mood and helping behavior

	Temperature	Humidity	Age	Mood valence
Helping behavior	.111	-.045	.210*	.206*
Mood Valence	-.384*	.161	.183	1.00

*p<.05, **p<.01

to mood but there was a significant positive relationship ($r = .21, p > .05$, two tails) with helping behavior. Thus, older adults were found to be more helpful than younger adults. This finding is supported by the study done by Gallagher (1994) which reports that helping behaviour increases with age, especially with regard to helping strangers who are in need.

Erikson's (1968) stages of psychosocial development could be another explanation for the above result. In the seventh stage (Generativity vs. Stagnation) focusing on middle adulthood (25-64 years), individuals have a growing concern towards contributing to society and helping to guide the next generation. Therefore, as adults grow older they find any means of helping others to generate a sense of productivity and accomplishment and accordingly seek opportunities to do so.

The helping behaviour of older adults could also be qualified as a form of mood-elevating behaviour which is supported by the Negative State Relief Hypothesis (Baumann et al., 1981). This is specific to older adults as they are experiencing critical life changes such as menopause or empty nest syndrome which result in them feeling a whole range of negative emotions. Helping behaviour therefore serves as a means of alleviating such feelings.

The temperature recorded in Chennai on the days of data collection ranged from 33°C (91.4°F) to 40°C (104°F) and in Mysore it ranged from 26°C (78.8°F) to 34°C (93.2°F). Results of the present study indicated that temperature was negatively related to mood valence ($r = -.384, p > .01$, two tails), implying that increases in temperature are related to reports of lowered mood, similar to findings by Denissen et al. (2008) that point out that negative affect is related to higher temperatures. An increase in temperature results in individuals feeling a great amount of physical discomfort which could then be manifested in bouts of irritability, aggression, fatigue or lethargy - an overall decline in mood. However, the result is contrary to findings by Keller et al. (2005) and Watson (2000), who did not find effects of weather on overall mood valence.

The present study indicates that there is no significant relationship between temperature and helping behavior and humidity is not found to be related to mood valence or helping behavior.

Table 3. Correlation between helping behavior, temperature and humidity, controlling mood valence

Measure		Temperature	Humidity
Controlling Mood Valence	Helping behavior	.211*	-.081

* $p < .05$

Mood valence was significantly related to helping behavior. This is supported by past research which has shown rather consistently that positive mood states lead to increased helpfulness. (Carlson, Charlin & Miller, 1988). Positive mood states have been shown to increase altruism, increase helping and volunteering behavior (Harris & Huang, 1973; Kazdin & Bryan, 1971).

Wang and Graddy (2008) suggest that happy people are both more emotionally capable to help others and have more optimistic personalities, fostering charitable giving behavior.

When mood valence was controlled for, using partial correlation, a significant positive relationship ($r = .211, p > .05$) was found between temperature and helping behavior. A study by Schneider, Lesko & Garrett (1980) that studied the helping behavior of adults under hot and cold conditions, revealed no support for the hypothesis that hot and cold temperatures inhibit helping behavior. In fact, the present study indicated that as temperature increased, individuals displayed a higher tendency to help, regardless of their mood state at the time. This could be attributed to the benevolent nature of the participants of the present study. The results however are in direct contrast with Cunningham's (1979) findings wherein temperature was negatively associated with helping behavior in summer.

Interestingly, when partial correlations for the two cities were carried out separately, no significant relationship was found between temperature and helping behaviour was found in either city.

There was no significant relationship between humidity and helping behavior reported in the present study which once again contradicts previous findings. Cunningham (1979) found people to be more helpful when the humidity was low than when the humidity was high. Again, partial correlations carried out for each city separately saw no significant relationship between humidity and helping behaviour.

Table 4. Mood valence and helping behavior means for males and females

	GENDER		<i>t</i>	<i>df</i>
	Males	Females		
Mood valence	19.58 (9.80)	15.91 (12.36)	1.635 (NS)	97
Helping Behavior	25.58 (23.52)	17.71 (17.84)	1.872 (NS)	97

Note : NS - Not significant.

Standard deviations appear in the parentheses below the mean.

Independent sample t-test, to study gender differences in mood valence and helping behavior, revealed no significant differences between males and females in terms of their mood or helping behavior. This is in accordance with a study by Monk-Turner et al. (2002) wherein no significant differences in helping behavior were found between male and female subjects, all else being equal.

Table 5. Temperature, humidity, mood valence and helping behavior means for Mysore and Chennai

	CITY		<i>t</i>	<i>df</i>
	CHENNAI	MYSORE		
Temperature	28.80 (2.814)	36.55 (2.762)	-132.829**	97
Humidity	57.20 (12.80)	45.80 (7.54)	5.387**	97
Mood valence	2042 (10.84)	15.06 (11.09)	2.432* (NS)	97
Helping Behaviour	21.73 (18.73)	22.14 (23.59)	-.211 (NS)	97

Note : NS - Not significant.

*= $p < .05$, **= $p < .01$.

Standard deviations appear in the parentheses below the mean.

Differences between the two cities, on temperature, humidity, mood valence and helping behavior were also calculated. Participants from Mysore and Chennai differed significantly in terms of their mood, with participants from Mysore reporting better mood. This difference may be attributed to the fact that the weather conditions (temperature and humidity) of both cities differ significantly. There were no significant differences in terms of helping behavior of participants from the two cities. Though participants from Mysore report significantly higher moods, their helping behavior ($x = 21.24$) seems to be approximately the same as participants from Chennai ($x = 22.14$).

CONCLUSION

Mood was related to both temperature and helping behavior. When the effect of mood was controlled for, there was a positive relationship between temperature and helping behavior, implying that increases in temperature were related to increased helping behavior. While participants from Mysore experienced better moods than participants from Chennai, the extent of helping behavior did not differ significantly. Age was not related to mood but was significantly related to helping behavior. There were no gender differences observed in mood or helping behavior.

IMPLICATIONS

From this study implications may be drawn about the weather and mood of individuals being indicators of how helpful or friendly individuals are at a given situation. The influence of temperature on human emotions and social interaction is an interesting finding that is often negated. The involvement of environmental factors in determining how willing an individual is to initiate a conversation or to give charity is also studied. Conversely, the study also sows the seeds for some research on how these factors play a role in certain negative affect-related criminal behaviours as well.

LIMITATIONS

Though this study demonstrated that temperature and mood were related to helping behavior, there are other personality, social and environmental factors that could play a role in individuals' helping behavior. Such factors are beyond the scope of the present study and could be investigated in future research studies. Furthermore, other meteorological variables such as amount of sunshine, barometric pressure, wind velocity etc. could be taken into account as well.

Although our naturalistic design did not allow us to establish causality in the strict (experimental) sense, we believe that our findings are highly consistent with a causal model that flows from weather to mood and subsequently helping behaviour (we do however, acknowledge that our results remain silent regarding the processes that mediate associations between weather and mood, such as physiological processes or daily activities).

Due to the constriction of language placed by the usage of the English version of the PANAS, the sample was restricted to English speaking visitors to the zoological parks. Thus, the sample is not representative of all visitors to the zoo in Mysore and Chennai. Furthermore, all three researchers collecting data were female which could have influenced the results to a certain extent as implied in a meta-analytic study by Renner and Eagly (1984) which stated that female researchers received more help than male researchers.

Response to the questionnaire was based on voluntary participation of the study, which likely resulted in selection bias (e.g., unequal gender distribution). Furthermore, the relation between daily weather and mood and subsequent helping behaviour were found in a specified region of India (South) and might not generalize to all other climate types. In addition, we failed to assess the time that participants have been in the zoological park (or outdoors), which may have emerged as an important moderator of the effect of weather on mood (Keller et al., 2005). Crowding could be another influential extraneous factor that was not taken into account; considering the study

was conducted over a weekend, the number of visitors were higher than average. A final limitation is that we relied on self-reported mood that may be biased by implicit theories regarding the association between weather and mood.

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