

HITCHHIKING AND THE 'SUNSHINE DRIVER': FURTHER EFFECTS OF WEATHER CONDITIONS ON HELPING BEHAVIOR¹

NICOLAS GUÉGUEN AND JORDY STEFAN

Université de Bretagne-Sud

Summary.—Previous studies have shown that pleasant weather conditions can improve people's mood and facilitate positive social relationships. The current study tested the effect of sunshine on drivers' willingness to give hitchhikers a ride. Four confederates (2 men, 2 women; *M* age = 20 yr.) acted as hitchhikers on the roadside in France, on sunny and cloudy days. To minimize the influence of other important variables, hitchhiking was conducted only when it was not raining and only when the external temperatures were between 20° and 24 °C. Motorists' behavior in 2,864 hitchhiking events was analyzed. The results showed that both male and female drivers stopped more on sunny days than on cloudy days for both male and female hitchhikers. Perhaps the positive mood induced by the sunshine promotes helping behaviors.

Several experimental studies have shown that decisions are affected by the weather. Hirshleifer and Shumway (2003) reported that daily hours of sunshine were positively correlated with returns in the stock market. Simonsohn (2007) examined university admission decisions and found that applicants' academic attributes were weighted more heavily on cloudier days while non-academic attributes were weighted more heavily on sunnier days. Simonsohn (2010) also reported that cloudiness increased the appeal of academic activities.

Research has also shown that human social relationships are influenced by sunshine. Cunningham (1979) found that participants approached by an interviewer to participate in a survey were less reluctant to comply on sunnier days than on cloudier days. In a second experiment by the same author, it was found that the outdoor amount of sunlight could predict the gratuity that restaurant customers left to a waitress ($r = .12$). However, Flynn and Greenberg (2010), using a very large sample size (11,766 observations compared to 130 in Cunningham's study), failed to observe a weather effect on tipping. Research has also shown that expectations about the weather are associated with variation in social behaviors. Rind (1996) conducted an experiment in a hotel room without windows, where a male server delivered food and drinks to the guests' rooms and reported the weather conditions to the guests. When the server entered the rooms, if he was asked about the weather, he reported the actual sky con-

¹Address correspondence to Nicolas Guéguen, Université de Bretagne-Sud, rue de la loi, 56000 Vannes, France or e-mail (nicolas.gueguen@univ-ubs.fr).

dition as either sunny, partly sunny, cloudy, or rainy. It was found that better tips were left when the server mentioned pleasant weather conditions ($r = .14$).

Overall, these studies show that changes in weather conditions are associated with variations in human behavior. To explain this relationship, scientists argued that sunshine activates positive emotions and good mood which, in turn, influence behavior. Indeed, research has indicated that sunshine is clearly associated with a positive mood (Cunningham, 1979; Keller, Fredrickson, Ybarra, Côté, Johnson, Mikels, *et al.*, 2005; Denissen, Butalid, Penke, & van Aken, 2008), and several studies have shown that a positive mood facilitates social relationships and helping behavior (Harris & Smith, 1975; Weyant, 1978; Bizman, Yinin, Ronco, & Schachar, 1980; Job, 1987; Forgas, 1997; Rind, 1997; Forgas, 1998).

To expand on a previous study of the effect of sunshine on spontaneous helping behaviors, the present study assessed the case of hitchhiking. Firstly, previous research examining the effect of weather conditions on helping behavior suffered from methodological biases. In Rind's (1996) study, participants were simply informed about the weather condition; they could not see the sky. In Cunningham's (1979) study, the data were measured in different seasons and with a varied range of external factors such as temperature and humidity. Thus, examining the effect of the weather on people's behavior in a more natural setting and with more controlled conditions was necessary. Secondly, the effect of environmental conditions on hitchhiking has never been examined. Hitchhiking appears to constitute a good situation to examine various factors associated with helping behaviors. Previous research on hitchhiking showed that motorists' behavior is influenced by the hitchhiker's physical appearance (Morgan, Lockard, Fahrenbruch, & Smith, 1975; Guéguen, 2007), clothing (Crassweller, Gordon, & Tedford, 1972; Guéguen, 2012), or nonverbal behavior (Guéguen & Fischer-Lokou, 2004). The effects of environmental factors on the drivers' response, however, has not been examined. Considering the evidence of the positive effects of sunshine on social relationships, the following hypotheses were formulated.

Hypothesis 1. A higher percentage of drivers will stop and offer a ride to a hitchhiker on sunny days than on cloudy days.

Hypothesis 2. The drivers' gender will not interact with the effect of sunshine: there will be no significant difference between male and female drivers regarding their inclination to offer more rides to a hitchhiker on sunny days than on cloudy days.

Hypothesis 3. The hitchhikers' gender will not interact with the sunshine effect: there will be no significant difference between

male and female hitchhikers regarding receiving more rides on sunny days than on cloudy days.

METHOD

This experiment was approved by the ethical committee of the laboratory (CRPCC-LESTIC EA 1285). The confederates who volunteered to participate in the study received neither payment nor course credit for their participation. They were not aware of the goals of the experiment and were not given any information about previous studies on the effect of sunshine or on factors affecting drivers' behavior. They were simply told that the objective of the experiment was to survey the number of drivers in the area who stopped to offer a ride to a hitchhiker.

Participants

The drivers included 1,804 men and 1,060 women who were solicited by the hitchhikers. The hitchhikers were four confederates (2 men, 2 women; all 20 years old).

Procedure

The experiment took place in the south of Brittany, France, in a location where hitchhikers normally wait for motorists to offer them a ride. The confederate-hitchhiker stood by the side of the road in a spot chosen for its high visibility to motorists and because a broad road zone made it easy and safe to stop. The confederates were instructed that when a car came in sight, they should point their thumb up (a well-known signal for hitchhiking in France). Only one confederate acted at any given time. After 100 drivers had passed by (which took about 15 to 20 minutes), the confederate was replaced with another. Confederates and confederate gender conditions were randomized. Throughout the study, hitchhikers all had the same clothing appearance (a white tee-shirt, black trousers, and sneakers).

Two observers waiting in a car parked on the opposite side of the road 400 meters behind the place at which the confederate stood, were instructed to count the number of motorists on the opposite side and to note if the driver was a man or a woman. Both used two hand-held counters, one to count the female drivers and the other to count the male drivers. The agreement between the two observers' evaluation was high ($r = .96$).

The experiment was conducted on sunny and cloudy days during the months of May and June, only between 9.30 a.m. to 12.30 p.m. Precautions were taken to avoid the influence of other important factors, such as rain and variations in outside temperature. Thus, the experiment was conducted only when it was not raining and when the temperatures ranged between 20° and 24 °C. The outside temperature was measured with the help

of an electronic temperature recorder. Controlling for the outside temperatures to be in such a small range was possible, since the two towns where the experiment was conducted have very modest variations in temperature during the mornings, due to their proximity to the sea.

Measures

This study measured the percentage of drivers who stopped to offer a ride to the hitchhikers out of the total number of solicited drivers. To obtain better control of the weather conditions, 40 pedestrians (20 men, 20 women) with driver's licenses were asked to evaluate the sky conditions with the help of a scale ranging from 1: Cloudy to 9: Sunny. This validation study was done by two assistants, who were not used as hitchhiking confederates. To prevent the confederates from guessing the objective of the study, they were not present during this phase of the experiment. The hitchhiking study was run only on days when the mean of the group of pedestrian ratings was from 1 to 3 (on cloudy days) or from 7 to 9 (on sunny days).

RESULTS

Table 1 presents the percentage of drivers who stopped on cloudy and sunny days. The data are arranged according to both the drivers' and the hitchhikers' genders.

TABLE 1
PERCENTAGE OF MOTORISTS WHO STOPPED FOR HITCHHIKERS BY WEATHER CONDITION,
HITCHHIKER'S GENDER, AND MOTORIST'S GENDER

Motorist's Gender	Male Hitchhikers		Female Hitchhikers	
	Sunnier Days	Cloudier Days	Sunnier Days	Cloudier Days
Male (<i>n</i> = 1,804)	7.9% (35/440)	5.2% (25/478)	14.9% (64/428)	9.8% (45/458)
Female (<i>n</i> = 1,060)	4.4% (11/252)	1.5% (5/266)	7.5% (20/266)	5.4% (15/276)

To assess the effects that the weather and gender variables may have had, a 2 (driver's gender) \times 2 (hitchhiker's gender) \times 2 (weather condition) log-linear analysis was applied.

Analyses between weather condition, drivers' gender, and hitchhikers' gender revealed no statistically significant interactions, thereby supporting Hypotheses 2 and 3. Hypothesis 1 was also supported: a main effect of weather condition was found [χ^2 (1, 2864) = 10.92, p = .001; OR = 1.60, 95%CI = 1.20, 2.13] revealing that, overall, drivers stopped more on sunnier days (9.4%) than on cloudier days (6.1%). A main effect of drivers' gender was also found [χ^2 (1, 2864) = 19.55, p < .001; OR = 2.05, 95%CI = 1.46,

2.86]: male drivers stopped more (9.4%) than female drivers (4.8%). Another main effect of hitchhikers' gender was found [$\chi^2(1, 2864) = 23.18, p < .001$; OR = 2.07, 95%CI = 1.49, 2.71], with drivers stopping more to offer a ride to a female hitchhiker (10.1%) than to a male hitchhiker (5.3%).

DISCUSSION

A greater number of motorists stopped to offer a ride to a hitchhiker on sunny days. These results extend those reported in previous studies that sunshine is associated with positive social relationships (Cunningham, 1979). Regardless of the way that the request for help was addressed (verbally in Cunningham's study, and non-verbally/spontaneously in the current study) sunshine promoted helping behaviors. Flynn and Greenberg (2010) failed to observe a positive effect of sunshine on tipping, but their study did not include any control of temperature or rain unlike the current experiment, where a statistical difference was observed but the effect size was small, thus suggesting that the weather had only a small effect on people's behavior.

The positive effect of weather on hitchhiking was found with both male and female motorists and with both male and female hitchhikers. These results contradicted those found by Connolly-Pray (2012), who reported that women were much more responsive to the weather than men. However, methodological differences could explain this difference of results between the two studies. In Connolly-Pray's study, the effect of temperature or rain on people's job, life, and health satisfaction or happiness was examined; in the current experiment, drivers' behavior was not tested on rainy days, and the temperature was controlled.

Several studies have indicated that people reported being in a positive mood on sunnier days (Cunningham, 1979; Keller, *et al.*, 2005; Denissen, *et al.*, 2008). It has also been found that a positive mood facilitates social relationships and helping behavior (Job, 1987; Rind, 1997; Forgas, 1998). Thus, the positive effect of sunshine on people's willingness to help other people is most likely mediated by mood. It would be worth investigating, in further work, the role of mood on helping behavior in different weather conditions.

This experiment has some limitations. The confederates were not informed about the real objective of the study and the previous research on this topic. However, it is possible that the cloudy and sunny weather affected them as well, so they may have unconsciously behaved differently in the different weather conditions (e.g., being happier and smiling more on sunny days than on cloudy days). In addition, although this study controlled for external temperatures and rain, other variables that are difficult to control, such as humidity and wind, could have had an influence on the drivers' responses. In this study, a positive effect of sunshine was

found, but the effect can not be generalized to all individuals. Among 497 Dutch adolescents, Klimstra, Frijns, Keijsers, Denissen, Raaijmakers, van Aken, *et al.* (2011) reported that 13% were labeled Summer Lovers (better mood with warmer and sunnier weather), 22% were labeled Summer Haters (worse mood with warmer and sunnier weather), and 41% were labeled as unaffected (weak associations between the weather and mood). Thus it would also be worth examining, in the future, the difference in helping behavior between Summer Lovers and Summer Haters. Finally, the research studies examining the effect of weather conditions on human behavior appear to have used different measures, ranging from subjective categorizations or ratings to objective measures. Thus, comparing findings in the literature appears somewhat difficult, and there is a need for a standardization method to measure weather conditions because results could vary dramatically according to the measure chosen.

REFERENCES

- BIZMAN, A., YININ, Y., RONCO, B., & SCHACHAR, T. (1980) Regaining self-esteem through helping behavior. *The Journal of Psychology*, 105, 203-209.
- CONNOLLY-PRAY, M. (2012) Some like it mild and not too wet: the influence of weather on subjective well-being. *Journal of Happiness Studies*, 14, 457-473. DOI: 10.1007/s10902-012-9338-2
- CRASSWELLER, P., GORDON, M., & TEDFORD, W. (1972) An experimental investigation of hitchhiking. *Journal of Psychology*, 82, 43-47.
- CUNNINGHAM, M. R. (1979) Weather, mood, and helping behavior: quasi experiments with the Sunshine Samaritan. *Journal of Personality and Social Psychology*, 37, 1947-1956.
- DENISSEN, J. J. A., BUTALID, L., PENKE, L., & VAN AKEN, M. A. G. (2008) The effects of weather on daily mood: a multilevel approach. *Emotion*, 8, 662-667.
- FLYNN, S. M., & GREENBERG, A. E. (2010) Does weather actually affect tipping? An empirical analysis of time series data. Personal document, available online at <http://mpra.ub.uni-muenchen.de/25118/>.
- FORGAS, J. P. (1997) Affect and strategic communication: the effects of mood on the production and interpretation of verbal requests. *Polish Psychological Bulletin*, 28, 145-173.
- FORGAS, J. P. (1998) Asking nicely? The effects of mood on responding to more or less polite requests. *Personality and Social Psychology Bulletin*, 24, 173-185.
- GUÉGUEN, N. (2007) Bust size and hitchhiking. *Perceptual & Motor Skills*, 105, 1294-1298.
- GUÉGUEN, N. (2012) Color and women hitchhikers' attractiveness: gentlemen drivers prefer red. *Color Research and Application*, 37(1), 76-78.
- GUÉGUEN, N., & FISCHER-LOKOU, J. (2004) Hitchhikers' smile and receipt of help. *Psychological Reports*, 94, 756-760.
- HARRIS, M. B., & SMITH, R. J. (1975) Mood and helping. *The Journal of Social Psychology*, 91, 215-221.
- HIRSHLEIFER, D., & SHUMWAY, T. (2003) Good day sunshine: stock returns and the weather. *Journal of Finance*, 58, 1009-1032.

- JOB, S. (1987) The effect of mood on helping behavior. *The Journal of Social Psychology*, 127, 323-328.
- KELLER, M. C., FREDRICKSON, B. L., YBARRA, O., CÔTÉ, S., JOHNSON, K., MIKELS, J., CONWAY, A., & WAGER, T. (2005) A warm heart and a clear head: the contingent effects of weather on mood and cognition. *Psychological Science*, 16, 724-731.
- KLIMSTRA, T., FRIJNS, T., KEIJSERS, L., DENISSEN, J., RAAIJMAKERS, Q., VAN AKEN, M., KOOT, H., VAN LIER, P., & MEEUS, W. (2011) Come rain or come shine: individual differences in how weather affects mood. *Emotion*, 11, 1495-1499.
- MORGAN, C., LOCKARD, J., FAHRENBRUCH, C., & SMITH, J. (1975) Hitchhiking: social signals at a distance. *Bulletin of the Psychonomic Society*, 5, 459-461.
- RIND, B. (1996) Effect of beliefs about weather conditions on tipping. *Journal of Applied Social Psychology*, 26, 137-147.
- RIND, B. (1997) Effect of interest arousal on compliance with a request for help. *Basic and Applied Social Psychology*, 19, 49-59.
- SIMONSOHN, U. (2007) Clouds make nerds look good: field evidence of the influence of incidental factors on decision making. *Journal of Behavioral Decision Making*, 20, 143-152.
- SIMONSOHN, U. (2010) Weather to go to college. *Economic Journal*, 120, 270-280.
- WEYANT, J. (1978) Effects of mood states, costs, and benefits of helping. *Journal of Personality and Social Psychology*, 36, 1169-1176.

Accepted November 19, 2013.

Copyright of Psychological Reports is the property of Ammons Scientific, Ltd. and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.