

# Sunny, Rainy, and Cloudy with a Chance of Mobile Promotion Effectiveness

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## Online Appendix A: Provinces and Cities



Robustness Check of City-Level Locational Effects

	(1)	(2)	(3)	(4)
<b>Sunny Weather</b>	<b>0.2555***</b>	<b>0.1753***</b>	<b>0.2999***</b>	<b>0.2332***</b>
	(0.010)	(0.014)	(0.011)	(0.015)
<b>Rainy Weather</b>	<b>-0.0534***</b>	<b>-0.1212***</b>	<b>-0.0507***</b>	<b>-0.1417***</b>
	(0.014)	(0.017)	(0.014)	(0.017)
Ad Copy Framing			0.1553***	0.4536***
			(0.014)	(0.020)
Wind Power		-0.2141***		-0.2845***
		(0.023)		(0.024)
Temperature		-0.0109***		-0.0591***
		(0.003)		(0.004)
Temperature Range		0.0315***		0.0661***
		(0.003)		(0.004)
Intercept	-4.9502***	-4.1559***	-4.9514***	-2.7294***
	(0.092)	(0.142)	(0.092)	(0.158)
Wind Direction	Yes	Yes	Yes	Yes
City Fixed Effect	Yes	Yes	Yes	Yes

### 344 city names

	Names of the Cities
Urban (167)	Anqing, Anyang, Anshan, Bengbu, Baotou, Baoji, Baoding, Beihai, Beijing, Benxi, Binzhou, Cangzhou, Changde, Changzhou, Chaozhou, Chenzhou, Chengdu, Chifeng, Chuzhou, Dalian, Daqing, Datong, Deyang,

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Dezhou, Dongguan, Dongying, Erdos, Foshan, Fuzhou, Fushun, Ganzhou, Guangzhou, Guiyang, Guilin, Harbin, Haikou, Handan, Hangzhou, Hefei, Hengyang, Hohhot, Hulunbuir, Huzhou, Huaian, Huainan, Huanggang, Huangshi, Huizhou, Jixi, Jilin, Jinan, Jining, Jiamusi, Jiaying, Jiangmen, Jiaozuo, Jinhua, Jingmen, Jingzhou, Jiujiang, Kaifeng, Karamay, Kunming, Lhasa, Lanzhou, Langfang, Leshan, Lianyungang, Liangshan, Liaocheng, Linfen, Linyi, Liuzhou, Longyan, Loudi, Luzhou, Luoyang, Luliang, Ma'anshan, Maoming, Mianyang, Nanchang, Nanchong, Nanjing, Nanning, Nantong, Nanyang, Ningbo, Panjin, Pingdingshan, Putian, Qigihar, Qinhuangdao, Qingdao, Qingyuan, Quanzhou, Rizhao, Xiamen, Shantou, Shanghai, Shangrao, Shaoxing, Shenzhen, Shenyang, Shihezi, Shijiazhuang, Siping, Songyuan, Suzhou, Taizhou, Taiyuan, Taian, Taizhou, Tangshan, Tianjin, Tongliao, Tongling, Weihai, Weifang, Weinan, Wenzhou, Wuhai, Urumqi, Wuxi, Wuhu, Wuzhou, Wuhan, Xi'an, Xining, Xianyang, Xiangtan, Xiaogan, Xinxiang, Xinyu, Xingtai, Xuzhou, Xuchang, Yantai, Yanan, Yancheng, Yangzhou, Yangquan, Yibin, Yichang, Yichun, Yinchuan, Yingkou, Yulin., Yulin, Yueyang, Yuncheng, Zhanjiang, Zhangjiakou, Zhangzhou, Changchun, Changsha, Changzhi, Zhaoqing, Zhenjiang, Zhengzhou, Zhongshan, Chongqing, Zhoushan, Zhuhai, Zhuzhou, Zibo, Zigong

Rural (177) Aba, Aksu, Alashan, Aletai, Ali, Atushi, Ankang, Anshun, Bayinnaer, Bayinguoleng, Bazhong, Baicheng, Baishan, Baiyin, Baise, Baoshan, Bijie, Bozhou, BoLe, Changdu, Changji, Chaohu, Chaoyang, Chengde, Chizhou, Chuxiong, Dazhou, Dali, Greater Hinggan Mountains, Dandong, Dehong, Delingha, Dingxi, Douyun, Ezhou, Enshi, Fangchenggang, Fuzhou, Fuxin, Fuyang, Gannan, Ganzi, Golmud, Gejiu, Gonghe, Guyuan, Guangan, Guangyuan, Guichi, Guoluo, Hami, Haibeizhou, Haidong, Hainanzhou, Hanzhong, Haozhou, Hetian, Hechi, Heyuan, Heze, Hebi, Hegang, Heihe, Hengshui, Huludao, Huaihua, Huaibei, Huaiyin, huangnan, Huangshan, Hunchun, Gi'an, Jishou, Jieyang, Jinchang, Jinzhou, Jincheng, Jinzhong, Jingdezhen, Jinghong, Jiuquan, Kashgar, Kaili, Kuytun, Laiwu, Lijiang, Lishui, Liaoyang, Liaoyuan, Linzhi, Lincang, Linxia, Lu'an, Liupanshui, Longnan, Luohe, Barkam, Maqin, Meishan, Meihekou, Meizhou, Mudanjiang, Naqu, Nanping, Neijiang, Ningde, Panzhihua, Pingliang, Pingxiang, Puyang, Pu'er, Qitaihe, Qinzhou, Qingyang, Quzhou, Qujing, Shigatse, Sanmenxia, Sanming, Shannan, Shanwei, Shangluo, Shangqiu, Shaoguan, Shaoyang, Shiyan, Shizuishang, Shuangyashan, Shuozhou, Simao, Suihua, Suizhou, Suining, Tacheng, Tianshui, Tieling, Tonghua, Tongren, Tongchuan, Tongren, Turpan, Wenshan, Wulanchabu, Ulanhot, Wuzhong, Wuwei, Xilingol, Xilinhot, Xiantao, Xianning, Shangri-la, Xiangfan, Xinzhou, Xinyang, Xingyi, Suqian, Suzhou, Xuancheng, Ya'an, Yangjiang, Yichun, Yili, Yiyang, Yingtan, Yongzhou, Yushu, Yuxi, Yunfu, Zaozhuang, Zhangjiajie, Zhangye, Zhaotong, Zhongwei, Zhoukou, Zhumadian, Ziyang, Zunyi

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## Appendix B: Additional Results on Sunny Conditions

Also, the results in below table panel A suggest that the coefficients of *Allsunny* ( $coef.=0.3525$ ) and *Partialsunny* ( $coef.=0.1246$ ) are both positive and significant ( $p<0.05$ ). Column (4) to (6) report the interaction effects. Again, results support negative interaction of *Allsunny\*Prevention framing* ( $coef.=-0.3222$ ,  $p<0.05$ ) and *Partialsunny\*Prevention framing* ( $coef.= -0.2148$ ,  $p<0.05$ ), as expected. We also test the effect with sunlight hour of the day, which is a continuous variable of sunshine. Results in Table 9 Panel B confirm that that longer sunlight hours indeed induce higher purchase likelihood, thus lending more evidence for the sunny weather effects. Also, column 2 indicates a negative interaction effect of sunlight hour and prevention framing ad copy, as expected.

Panel A: All versus Partial Sunny Weather

	Full	All Sunny	Partial Sunny	Full	All Sunny	Partial Sunny
<b>All Sunny</b>	<b>0.3525***</b> (0.025)	<b>0.3802***</b> (0.027)		<b>0.4395***</b> (0.029)	<b>0.4437***</b> (0.030)	
<b>Partial Sunny</b>	<b>0.1246***</b> (0.027)		<b>0.1011**</b> (0.031)	<b>0.2277***</b> (0.037)		<b>0.1690***</b> (0.043)
<b>All Sunny*Framing</b>				<b>-0.3222***</b> (0.057)	<b>-0.3470***</b> (0.068)	
<b>Partial Sunny*Framing</b>				<b>-0.2148***</b> (0.055)		<b>-0.1437*</b> (0.064)
Ad Copy Framing	0.9063*** (0.061)	0.9084*** (0.063)	0.9849*** (0.064)	0.9486*** (0.061)	0.9293*** (0.063)	0.9982*** (0.065)
Intercept	-6.3116* (2.894)	-5.1314 (3.011)	1.4245 (3.609)	-5.3680 (2.896)	-3.6118 (3.016)	1.5646 (3.607)
Weather Covariates	Yes	Yes	Yes	Yes	Yes	Yes
Location Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Day Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Sunlight Hours

	(1)	(2)
<b>Sunlight Hours</b>	<b>0.0965***</b> (0.019)	<b>0.0567***</b> (0.009)
<b>Sunlight Hours*Ad Copy Framing</b>		<b>-0.0878*</b> (0.036)
Ad Copy Framing	4.0140*** (0.775)	2.0679*** (0.332)
Intercept	48.6490* (24.136)	-3.5628*** (0.763)
Weather Covariates	Yes	Yes
Location Fixed Effect	Yes	Yes
Day Fixed Effect	Yes	Yes

Note: logistic regression coefficient.  $^ap < 0.1$ ,  $^*p < 0.05$ ,  $^{**}p < 0.01$ ,  $^{***}p < 0.001$