

A Possible Solution to Contradictory Findings for Day of Week and Time of Day Effects on Response Rates

*By Lance Gentry**

Can a researcher improve survey response rates by sending invitations on a certain day of the week? What about sending at a certain time of day? Text survey response rates were tested by the day of the week and time of the day. Three groups of texts were sent for six days in a row (Monday through Saturday) to unique midwestern United States phone numbers. Texts were sent at three different times each day (mid-morning, mid-afternoon, and late evening). Although the differences were minor, the results indicated that some days and times generated higher response rates than others. However, a closer look at the data indicated that the key factor was actually the month of the invitation.

Keywords: *Text Surveys, Response Rates, Day of Week (DOW), Time of Day (TOD), Day of Invitation*

Introduction

Researchers use a variety of tools to survey respondents. Obtaining sufficient responses from a representative population may be challenging. Are there variables that researchers may manage to increase their response rates? In the twenty-first century, researchers have studied if the timing of survey invitations through emails, particularly the day of the week and time of day, can increase response rates of surveys. Various answers to this research question have been published. This research provides a possible answer to the conflicting results and utilizes a more recent innovation in survey invitations: inviting users to participate by texting a link to their cell phones.

Literature Review

Stone et al (2012) found that people had better moods on weekends, but only minimal support for a “Blue Monday effect” – thus, if positive and negative moods have a positive relationship with survey response rates, people would be more likely to complete surveys on weekends. On the other hand, if there was an inverse effect – where people in a negative mood because they are not enjoying themselves on the weekend – one would expect to see the highest response rates on Mondays.

Several researchers have not found Day of Week (DOW) effect, or not one that mattered. Howard et al (2024) found no day of the week effect for emailed invitations to panel survey questions. Their subjects were people who had already

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1 joined a panel. Some researchers found minor short-term Time of Day effects with
2 an emailed survey invitation, but all effects vanished over a six-day period
3 (Lindgren et al, 2020).

4 Other researchers found minor, yet significant DOW effects. Unfortunately,
5 their findings disagree upon the ideal time to solicit surveys. Wolff and Goritz
6 (2021) found that respondents were most likely to respond to email survey
7 invitations on Mondays and least likely to respond on Thursdays. Whereas Faught
8 et al (2004) found that they had the highest response rates on Wednesday mornings
9 and Lewis and Hess (2017) had the best response rates for email invitations on
10 Tuesday.

11 Recently (Binder, 2022), a researcher discovered that Saturday participants
12 were more likely to answer questions objectively than respondents who completed
13 surveys on other days.

14 Most of these studies were small in scope. Some took place within a single
15 day, whereas many others had limited participants. None of the researchers utilized
16 text surveys, all employed survey invitations sent via email.

19 **Methodology/Materials and Methods**

21 Text messages were sent to 427,305 adult residents from all counties of a
22 Midwestern US state between July 6, 2021 and August 30, 2021 inviting recipients
23 to complete an online survey. The message included a link to the survey.

24 The text invitations were sent in two batches. The first batch started on
25 Tuesday July 6, 2021. This date was selected since it was after the American
26 Independence Day weekend and no major holidays took place during the research.
27 Between July 6 and Monday, July 19, survey invitations were texted about 10:30
28 AM, 3:30 PM, and 8:30 PM on every day except Sunday. This was the first time
29 the market research firm had used mass text survey invitations and their software
30 programmer asked to keep the initial groups of survey invitations below five
31 thousand individual numbers per set of invitations. Thus, over the twelve days
32 Batch 1 invitations were deployed, thirty-six groups of approximately 4,900 phone
33 numbers were texted survey invitations about 10:30 AM, 3:30 PM, and 8:30 PM
34 on each day.

35 One of the immediate findings of this project was that the various cell phone
36 service providers (e.g., Verizon, T-Mobile, AT&T, and other regional and local
37 carriers) all had different thresholds for determining if a message was spam and
38 should be blocked. The research firm's focus on July 20 was to work with their
39 texting service and the various cell phone carriers to ensure that all the text survey
40 invitations would be delivered. This met with limited success.

41 Batch 2: The distribution of survey invitations resumed on Thursday, August
42 5 with an afternoon distribution. Despite assurances from the texting service, some
43 of these messages were also flagged as spam and not delivered. More efforts were
44 made by the texting service and the carriers. Distribution of text surveys resumed
45 on Monday, August 9. Also, effective that day, the software programmer was
46 confident that the system could handle larger volumes and the morning group was

1 increased to almost 14,000 text invitations to confirm this. That part of the process
 2 went well, but many texts were still blocked. After another round of
 3 communications between all parties, over 200,000 more text invitations were
 4 distributed on August 16, 17, and 18. The market research firm then waited a
 5 week to evaluate responses and sent their final group of survey invitations to
 6 approximately 21,000 respondents to recipients in combination of geographic
 7 (county)/gender/age range requirements to ensure they obtained sufficient responses
 8 from all of these segments to meet their research requirements. The texts in Batch
 9 2 were only sent on weekdays and during the mornings and afternoons.

10 According to the feedback provided by the cell phone providers to the texting
 11 service, 250,803 of the texts were successfully delivered to the respondents, a
 12 delivery rate of 58.69%. These texts, 100% of which were successfully delivered,
 13 were the ones evaluated for this paper.

16 Results

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 18 7,271 completed responses were obtained from the 250,803 text invitations
 19 that were successfully delivered, a response rate of 2.90%.

21 *Invitation Day of Week (DOW) and Time of Day (TOD)*

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 23 **Table 1.** *Deliveries and Completions by Invitation DOW and TOD*

Day of Week	Time of Day	Delivered	Completions	Completion Rate
Monday	Morning	26,032	756	2.90%
Monday	Afternoon	9,716	281	2.89%
Monday	Evening	4,428	86	1.94%
Tuesday	Morning	19,622	608	3.10%
Tuesday	Afternoon	50,481	1,633	3.23%
Tuesday	Evening	4,437	94	2.12%
Wednesday	Morning	39,967	1,274	3.19%
Wednesday	Afternoon	50,235	1,595	3.18%
Wednesday	Evening	4,359	99	2.27%
Thursday	Morning	4,478	85	1.90%
Thursday	Afternoon	6,106	132	2.16%
Thursday	Evening	4,354	101	2.32%
Friday	Morning	4,408	98	2.22%
Friday	Afternoon	4,417	82	1.86%
Friday	Evening	4,425	78	1.76%
Saturday	Morning	4,402	86	1.95%
Saturday	Afternoon	4,473	96	2.15%
Saturday	Evening	4,463	87	1.95%
Totals		250,803	7,271	2.90%

1 Simple linear regression was used to test if the combination of Day of Week
 2 (DOW) and Time of Day (TOD) significantly predicted the completion rate.
 3 Dummy variables were created for the various combinations with Monday
 4 Morning being the baseline case.

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6 **Table 2.** *Results of Linear Regression*

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.029	0.001		27.937	0.000
Monday Afternoon	0.000	0.002	0.000	-0.060	0.952
Monday Evening	-0.010	0.003	-0.008	-3.528	0.000
Tuesday Morning	0.002	0.002	0.003	1.226	0.220
Tuesday Afternoon	0.003	0.001	0.008	2.584	0.010
Tuesday Evening	-0.008	0.003	-0.006	-2.884	0.004
Wednesday Morning	0.003	0.001	0.006	2.122	0.034
Wednesday Afternoon	0.003	0.001	0.006	2.115	0.034
Wednesday Evening	-0.006	0.003	-0.005	-2.306	0.021
Thursday Morning	-0.010	0.003	-0.008	-3.707	0.000
Thursday Afternoon	-0.007	0.002	-0.007	-3.113	0.002
Thursday Evening	-0.006	0.003	-0.005	-2.128	0.033
Friday Morning	-0.007	0.003	-0.005	-2.493	0.013
Friday Afternoon	-0.010	0.003	-0.008	-3.838	0.000
Friday Evening	-0.011	0.003	-0.009	-4.185	0.000
Saturday Morning	-0.010	0.003	-0.007	-3.477	0.001
Saturday Afternoon	-0.008	0.003	-0.006	-2.792	0.005
Saturday Evening	-0.010	0.003	-0.008	-3.514	0.000

a. Dependent Variable: Completed

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9 While results were statistically significant for almost all group (there were no
 10 significant differences between the baseline completion rates of Monday morning
 11 invitations and those sent Monday afternoons and Tuesday mornings), the
 12 differences were relatively minor. Across the entire survey, the completion rate
 13 was 2.90%. According to these results, the best times to send text invitations are
 14 Tuesday afternoons, Wednesday afternoons, and Wednesday evenings. From
 15 Wednesday evening through Saturday evening, responses were significantly below
 16 the baseline. Monday evening was also significantly below the baseline, whereas
 17 Monday morning and afternoon were equivalent to the baseline.

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1 **Table 3.** *DOW and TOD Indexes from Overall Results*

Day of Week	Time of Day	Completion Rate	Index from Overall Results
Monday	Morning	2.90%	100%
Monday	Afternoon	2.89%	100%
Monday	Evening	1.94%	67%
Tuesday	Morning	3.10%	107%
Tuesday	Afternoon	3.23%	112%
Tuesday	Evening	2.12%	73%
Wednesday	Morning	3.19%	110%
Wednesday	Afternoon	3.18%	110%
Wednesday	Evening	2.27%	78%
Thursday	Morning	1.90%	65%
Thursday	Afternoon	2.16%	75%
Thursday	Evening	2.32%	80%
Friday	Morning	2.22%	77%
Friday	Afternoon	1.86%	64%
Friday	Evening	1.76%	61%
Saturday	Morning	1.95%	67%
Saturday	Afternoon	2.15%	74%
Saturday	Evening	1.95%	67%

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3 *Invitation Month*

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5 **Table 4.** *Deliveries and Completions by Invitation Month*

Month	Delivered	Completed	Completion Rate
July	79,901	1,690	2.12%
August	170,902	5,581	3.27%
Totals	250,803	7,271	2.90%

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7 Simple linear regression was used to test if the invitation month significantly
 8 predicted the completion rate. A dummy variable was used for the month with
 9 July being the baseline case.

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11 **Table 5.** *Results of Linear Regression*

Model	Coefficients ^a				
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.021	0.001		35.652	0.000
August	0.012	0.001	0.032	16.008	0.000

a. Dependent Variable: Completed

1 According to these results, market researchers will obtain statistically better
 2 completion rates if they consider the impact of the month on the behavior of their
 3 target audience.

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 5 **Table 6.** *July and August Indexes from Overall Results*

Month	Completion Rate	Index from Overall Results
July	2.12%	73%
August	3.27%	113%
Totals	2.90%	100%

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 7 *Invitation Month plus Day of Week and Time of Day*

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 9 **Table 7.** *Deliveries and Completions by Invitation Month*

Month	Day of Week	Time of Day	Delivered	Completed	Completion Rate
July	Monday	Morning	4,543	105	2.31%
	Monday	Afternoon	4,431	92	2.08%
	Monday	Evening	4,428	86	1.94%
	Tuesday	Morning	4,503	107	2.38%
	Tuesday	Afternoon	4,420	108	2.44%
	Tuesday	Evening	4,437	94	2.12%
	Wednesday	Morning	4,438	91	2.05%
	Wednesday	Afternoon	4,484	108	2.41%
	Wednesday	Evening	4,359	99	2.27%
	Thursday	Morning	4,478	85	1.90%
	Thursday	Afternoon	4,438	87	1.96%
	Thursday	Evening	4,354	101	2.32%
	Friday	Morning	4,408	98	2.22%
	Friday	Afternoon	4,417	82	1.86%
	Saturday	Morning	4,402	86	1.95%
	Friday	Evening	4,425	78	1.76%
	Saturday	Afternoon	4,473	96	2.15%
	Saturday	Evening	4,463	87	1.95%
August	Monday	Morning	21,489	651	3.03%
	Tuesday	Morning	15,119	501	3.31%
	Monday	Afternoon	5,285	189	3.58%
	Tuesday	Afternoon	46,061	1,525	3.31%
	Wednesday	Morning	35,529	1,183	3.33%
	Wednesday	Afternoon	45,751	1,487	3.25%
	Thursday	Afternoon	1,668	45	2.70%
Totals			250,803	7,271	2.90%

1 Multiple linear regression was used to test if both the month and the
2 combination of day of week and time of day significantly predicted the completion
3 rate.

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5 **Table 8.** *Results of Linear Regression*

Model		Coefficients ^a				
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.021	0.001		35.652	0.000
	August	0.012	0.001	0.032	16.008	0.000
2	(Constant)	0.021	0.001		15.135	0.000
	August	0.010	0.001	0.027	8.841	0.000
	Monday Afternoon	0.003	0.002	0.003	1.307	0.191
	Monday Evening	-0.002	0.003	-0.001	-0.533	0.594
	Tuesday Morning	0.002	0.002	0.004	1.565	0.118
	Tuesday Afternoon	0.002	0.001	0.006	1.914	0.056
	Tuesday Evening	0.000	0.003	0.000	0.080	0.936
	Wednesday Morning	0.002	0.001	0.005	1.655	0.098
	Wednesday Afternoon	0.002	0.001	0.004	1.460	0.144
	Wednesday Evening	0.002	0.003	0.001	0.607	0.544
	Thursday Morning	-0.002	0.003	-0.002	-0.689	0.491
	Thursday Afternoon	-0.002	0.002	-0.002	-0.818	0.414
	Thursday Evening	0.002	0.003	0.002	0.775	0.438
	Friday Morning	0.001	0.003	0.001	0.444	0.657
	Friday Afternoon	-0.002	0.003	-0.002	-0.830	0.406
	Friday Evening	-0.003	0.003	-0.003	-1.157	0.247
	Saturday Morning	-0.001	0.003	-0.001	-0.492	0.623
	Saturday Afternoon	0.001	0.003	0.000	0.177	0.859
	Saturday Evening	-0.001	0.003	-0.001	-0.510	0.610

a. Dependent Variable: Completed

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According to these results, market researchers will obtain better results if they
8 survey the general public in August compared to July.

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10 **Table 9.** *July and August Indexes from Overall Results*

Month	Day of Week	Time of Day	Completion Rate	Index from Overall Results
July	Monday	Morning	2.31%	80%
	Monday	Afternoon	2.08%	72%
	Monday	Evening	1.94%	67%
	Tuesday	Morning	2.38%	82%

	Tuesday	Afternoon	2.44%	84%
	Tuesday	Evening	2.12%	73%
	Wednesday	Morning	2.05%	71%
	Wednesday	Afternoon	2.41%	83%
	Wednesday	Evening	2.27%	78%
	Thursday	Morning	1.90%	65%
	Thursday	Afternoon	1.96%	68%
	Thursday	Evening	2.32%	80%
	Friday	Morning	2.22%	77%
	Friday	Afternoon	1.86%	64%
	Saturday	Morning	1.95%	67%
	Friday	Evening	1.76%	61%
	Saturday	Afternoon	2.15%	74%
	Saturday	Evening	1.95%	67%
August	Monday	Morning	3.03%	104%
	Tuesday	Morning	3.31%	114%
	Monday	Afternoon	3.58%	123%
	Tuesday	Afternoon	3.31%	114%
	Wednesday	Morning	3.33%	115%
	Wednesday	Afternoon	3.25%	112%
	Thursday	Afternoon	2.70%	93%

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When controlling for the month, none of the day of week or time of day variables are statistically significant.

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Discussion and Conclusion

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When looking at the day of week and time of time factors, it initially appeared that if a market research firm has the option to select when to text survey invitations, some days of the week and times of the day were better than others. However, once the month was considered, it became clear that day of week and time of day variables were not actually important. The key factor was the month of the invitation. This finding may explain the variance in previous studies. Researchers who have found significant differences based on the day of the week or time of day should control for larger timing issues, such as the month or local holidays, as part of their research.

The data in this study came from a survey of the general population of a mid-western state. According to Statista (2023), 26% of American adults planned on traveling in June 2022 compared to only 12% in August. Assuming these proportions were similar in 2021, this provides further support that large timing issues are more important than day of week or time of day factors. The facts suggest that the response rate for the general public was better in August because

1 less people were taking summer vacations compared to July. Further, if researchers
2 do not control for these larger issues, they may draw the wrong conclusion from
3 their data.

4 The experience of this market research firm that shared their data also showed
5 that understanding how to work with cellular carriers to ensure proper delivery of
6 survey invitations is much more significant than the day of week or time of day
7 that the invitation is issued. In this instance, the firm paid for 427,307 texts to be
8 sent, but only 250,803 of them were delivered. While this was still less expensive
9 for the market research firm than the phone surveys they used on their previous
10 project, there was ample opportunity for improvement since 41.3% of the texts
11 they paid for were not delivered.¹

12 13 14 **References**

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¹That is not completely accurate. Out of the 176,502 texts that were reported as not delivered, the market research firm obtained 523 completed surveys from these invitations (0.30% response rate from those that had “failed deliveries”). These responses were not included in the results reported in this article, and shows that even the information provided by the cellular phone carriers to the texting service is not 100% reliable.