

*RESEARCH AND PRACTICE NOTE /
NOTE SUR LA RECHERCHE ET LES MÉTHODES*

**AN ILLUSTRATION OF A METHODOLOGY TO
MAXIMIZE MAIL SURVEY RESPONSE RATES
IN A PROVINCIAL SCHOOL-BASED PHYSICAL
ACTIVITY NEEDS ASSESSMENT**

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Abstract: Two mail surveys were conducted as a province-wide needs assessment to examine the opportunities for, barriers to, and participation in physical activity in Ontario elementary and secondary schools. Dillman's Tailored Design Method (TDM) was used to maximize the quality of responses and the response rate. Both surveys entailed five mailings to key informants from randomly selected schools. The response rate among the 599 elementary and 600 secondary schools was 85% and 79%, respectively. This article discusses how the TDM strategies (i.e., strategies to establish trust, increase perceived rewards, and decrease perceived costs among key informants) were used to yield high response rates, examines the response rates after each mailing, and shares

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some lessons learned, which will be useful to researchers who are considering using the TDM in surveys designed to develop and evaluate programs.

Résumé : Nous avons mené deux sondages postaux pour évaluer les besoins à l'échelle provinciale et examiner les occasions de participation aux activités physiques et les barrières existantes dans les écoles primaires et secondaires de l'Ontario. La méthode conçue sur mesure de Dillman (*Tailored Design Method* ou TDM) a été utilisée pour optimiser le taux et la qualité des réponses. Les deux sondages consistaient en cinq envois postaux à des personnes-ressources clés des écoles choisies aléatoirement. Le taux de réponses parmi les 599 écoles primaires et les 600 écoles secondaires a été respectivement de 85 % et 79 %. Cet article examine comment les stratégies TDM (i.e., les stratégies pour établir la confiance, augmenter les récompenses subjectives, et diminuer les coûts perçus parmi les personnes-ressources clés) ont été utilisées pour obtenir des taux de réponses élevés, examiner les taux de réponses après chaque envoi postal, et en tirer quelques leçons, qui seront utiles aux chercheurs qui envisagent l'utilisation de la méthode TDM dans des sondages conçues pour élaborer et évaluer les programmes.

INTRODUCTION

Children and adolescents who regularly participate in physical activity derive many physical, psychological, and social health benefits from it, such as a decreased likelihood of becoming obese or developing coronary heart disease (U.S. Department of Health and Human Services, 1996) and increased self-esteem and social skills (Aaron et al., 1995). Also, participating in physical activity when young can track into adulthood (Malina, 1996; Trudeau, Laurencelle, Tremblay, Rajic, & Shephard, 1999). Unfortunately, physical activity participation declines during adolescence (Allison & Adlaf, 1997; Craig, Cameron, Russell, & Beaulieu, 2001). Children and adolescents spend a great deal of time at school, and therefore it is important to know the opportunities for and participation in school-based physical activity in Ontario elementary and secondary schools. For example, the Ontario *Chief Medical Officer of Health Report* recommended an assessment of opportunities for physical activity in schools to promote healthy weights (Ministry of Health and Long-term Care, 2004). We conducted two mail surveys as a province-wide needs assessment to examine the extent of a social problem (Posavac & Carey, 2007; Rossi, Lipsey, & Freeman, 2004; Royse, Thyer, Padgett, & Logan, 2001), namely, the opportunities for,

barriers to, and participation in physical activity in Ontario elementary and secondary schools.

Dillman's (2000) Tailored Design Method (TDM) was used in both surveys to maximize the quality of responses and the response rate. The TDM entails strategies to establish trust among potential respondents, increase their perceived rewards for responding, and decrease their perceived costs for responding. Dillman (2000) suggests that the TDM can be tailored to accommodate different survey conditions but that one can expect about a 75% response rate for mail surveys that use most of the strategies. Dwyer et al. (2006, 2008) presented results related to survey content and simply listed the five mailings in the TDM because of limited space for the articles. The current article discusses how the TDM strategies were used in the needs assessment to yield high response rates, examines the response rates after each mailing, and shares some lessons learned.

METHOD

Participants

Key informants from 512 of the 599 randomly selected elementary schools in Ontario and 474 of the 600 randomly selected secondary schools in the province returned completed questionnaires about opportunities for, barriers to, and participation in physical education, intramurals, and inter-school sports. Details are provided elsewhere (Dwyer et al., 2006, 2008).

Procedure

Both surveys followed the same procedure, which entailed five mailings over an eight-week period: (a) a pre-notice letter was sent to all key informants in January 2004, informing them that they would receive a questionnaire in a few days; (b) one week later, a package consisting of a letter, the questionnaire, a gift of appreciation, and a stamped, addressed return envelope was sent to all key informants; (c) one week later, a reminder postcard was sent to all key informants; (d) two weeks later, a package consisting of a letter, a replacement questionnaire, and a stamped, addressed return envelope was sent to nonrespondents; and (e) four weeks later, a similar package was couriered to the nonrespondents' schools. When we received completed questionnaires, the date of return was stamped on them, which allowed us to examine the response rate over time.

HOW THE TDM STRATEGIES SUGGESTED BY DILLMAN (2000) WERE APPLIED

Table 1 describes the strategies used to establish trust among the key informants: showing that a well-respected institution is conducting the survey, being transparent, providing a gift of appreciation in advance, and using return envelopes with real stamps. Table 2 explains the strategies used to make it rewarding for them to participate in the survey. It is more rewarding when they are respected, participate in a relevant and important survey, receive personalized correspondence, receive a professional-looking questionnaire, have options for how to complete the questionnaire, are appreciated, and are similar to their peers. Table 3 describes the strategies used to decrease their perceived costs for completing the questionnaire. There are less concerns and effort when they are ensured confidentiality, complete a short questionnaire, have access to a toll-free phone number, can easily obtain a replacement questionnaire, and have a stamped, addressed return envelope. However, as noted by Dillman (2000), the categories overlap and thus some strategies could appear in more than one category. For example, providing options for how to complete the questionnaire can be considered a strategy to increase perceived rewards (i.e., accommodating their preferences) and also decrease perceived costs (i.e., avoiding an inconvenient option).

Table 1
Strategies Used to Establish Trust Among Key Informants

Strategy	Comment
Showing that a well-respected institution is conducting the survey	<ul style="list-style-type: none"> • Each letter was on university letterhead. • The university emblem was on the postcard. • In the letter in the first and second mailings, they were told the names of the research team members. • The first author's address was on each letter and the postcard. He signed each letter and the postcard. He signed in blue ink to underscore that the signature was not produced by a machine. This also personalized the correspondence.
Being transparent	<ul style="list-style-type: none"> • A unique identification number was printed in the corner of each questionnaire. In the letter in the second and fourth mailings, they were ensured confidentiality and informed that the number will be used to keep track of returned questionnaires so that a follow-up questionnaire will be sent only to those who have not responded. They were told not to put their name on the questionnaire. This underscored our commitment to ensuring confidentiality.
Providing a gift of appreciation in advance	<ul style="list-style-type: none"> • Prior to the surveys, we asked several teachers about possible gifts that respondents would appreciate receiving. Based on their feedback, we decided that a school-related, small gift of appreciation was best.

Specifically, we chose a \$15 gift certificate from Scholar's Choice, which is a Canadian chain of retail stores that sell educational materials online. School staff are quite familiar with this retailer and its online service. Dillman (2000) contends that it is better to send the tangible incentive with the questionnaire, rather than promise to send the reward after receiving the completed questionnaire, because it creates a sense of obligation to complete the questionnaire in exchange for receiving the token of appreciation in advance. Therefore, the gift of appreciation was sent with the questionnaire in the second mailing, which showed that we trust them to return the questionnaire.

Using return envelopes with real stamps	<ul style="list-style-type: none"> As suggested by Dillman (2000), a stamped, addressed return envelope, rather than a business reply envelope, was enclosed in the second, fourth, and fifth mailings because it showed that we trust them to return the questionnaire rather than remove and use the stamp for a different reason. Also, they may have hesitated to not participate in the survey when this entails discarding something worth money.
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Table 2
Strategies Used to Increase Key Informants' Perceived Rewards For Participating in the Survey

Strategy	Comment
Showing respect	<ul style="list-style-type: none"> In the pre-notice letter, we told them ahead of time that we would be sending them a questionnaire in a few days. This avoided a surprise questionnaire. They were told the purpose of the survey in each letter (and postcard), which was respectful. Specifically, they were informed that the survey is about the opportunities available for structured physical activity such as physical education, intramurals, and inter-school sports in Ontario elementary (or secondary) schools. In the letter in the second and third mailing, they were told that they are likely most familiar with opportunities available for physical activity in their school and that therefore we are requesting their help. This conveyed that we value their knowledge and expertise in the area. In the letter in the second, fourth, and fifth mailings, they were told that if they think that this questionnaire should have been sent to someone else in their school who can answer the questions better, then they should return the questionnaire and tell us to whom we should send the questionnaire. This showed that we value their time and do not want to burden them unnecessarily. In the letter in the fourth and fifth mailings, they were informed that if they prefer to not participate in the survey, they could let us know by returning a note and blank questionnaire. This reduced any pressure to participate.
Emphasizing that the survey is relevant and important	<ul style="list-style-type: none"> The survey materials were mailed to school staff who were likely to be most knowledgeable about opportunities for school-based physical activity (e.g., health and physical education specialists), which made the survey relevant to them. <p style="text-align: right;"><i>(continued next page)</i></p>

(continued)

- In the letter in the second, fourth, and fifth mailings and on the postcard, they were told that their school was randomly selected to participate in the survey and that it is important that they participate to obtain accurate, representative results regarding opportunities available for school-based physical activity in Ontario.
 - In the letter in the first, second, fourth, and fifth mailings, they were told that the results will be disseminated to the provincial government and organizations responsible for developing and implementing physical activity policies and programs.
 - The postcard contained a toll-free phone number to contact the research coordinator if they did not receive a questionnaire or if it was misplaced, and they were told that she would mail another one to them immediately, which suggested that their participation in the survey is important to us.
 - In the fifth mailing, the package was couriered to the non-respondents' schools, indicating that their response is important.
- Personalizing the correspondence
- A mail merge using a spreadsheet was done to personalize the correspondence. The key informant's name (rather than "Dear Sir or Madame") was printed in the address and salutation in each letter. An address and salutation were not printed on the postcard because this would have increased the costs of the surveys considerably.
 - The date was printed on each letter and the postcard rather than sending undated correspondence.
 - Personalized address labels were printed for all the mailings.
- Creating a professional-looking questionnaire and postcard
- The questionnaire was developed into a 7 inch x 8 ½ inch survey booklet with an attractive front cover (e.g., title of the survey; university emblem; an emblem created for these surveys, which looked like a person skipping rope and also raising his/her arms in victory; return address to accommodate those who might lose the addressed return envelope; identification number) and well-organized questions that were previously pilot tested with several teachers and principals.
 - The 6 ¼ inch x 4 ½ inch postcard had the title of the survey, university emblem, and survey emblem on one side, and text, forwarding address label, and stamp on the other side.
- Giving options in how to complete the questionnaire
- In the letter in the second, fourth, and fifth mailings, they were given the option of completing the enclosed questionnaire or using the assigned identification number to complete the questionnaire online (SurveyMonkey.com) if it was more convenient.
- Showing appreciation
- In each letter, they were thanked for their time and consideration to complete the questionnaire. On the postcard, thanks were extended to those who already completed and returned the questionnaire, and non-respondents were encouraged to return their completed questionnaire at their earliest convenience.
 - In the letter in the first mailing, they were informed that we would enclose a small gift of appreciation in the next mailing as a way of saying thanks for their help. A gift of appreciation was enclosed in the second mailing.
- Mentioning previous respondents
- In the letter in the fourth mailing, we emphasized that school representatives who have already responded have provided us with information that will be very useful for the government and other organizations responsible for developing and implementing physical activity policies and programs in Ontario. This suggested that they join their peers in providing useful comments.
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Table 3
Strategies Used to Decrease Key Informants' Perceived Costs For Participating in the Survey

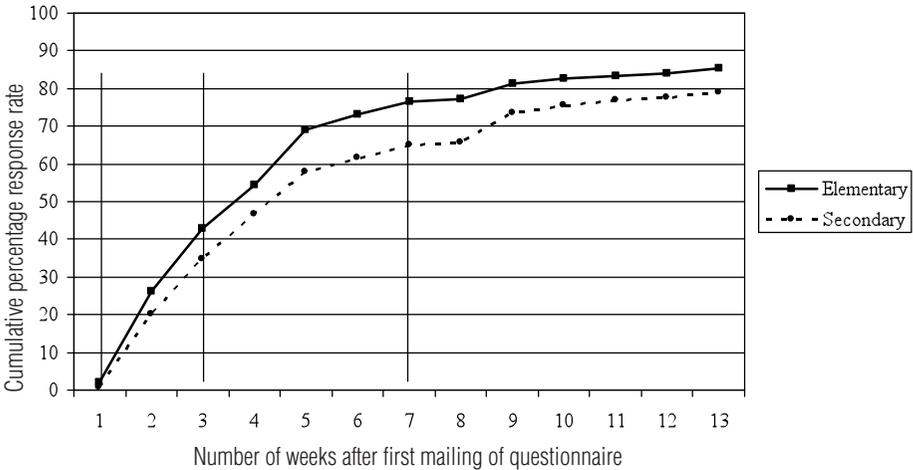
Strategy	Comment
Ensuring confidentiality	<ul style="list-style-type: none"> In the letter in the second and fourth mailings, they were told that their answers are completely confidential and to not put their name on the questionnaire. In the letter in the fourth mailing, they were told that individual schools will not be connected to the results. In the questionnaire, they were told that personal questions related to information such as their position in the school and how many years they worked there are being asked to help us interpret the results. They were ensured confidentiality.
Creating a short questionnaire	<ul style="list-style-type: none"> In the letter in the second mailing, they were told that it would take about 15 minutes to complete the questionnaire.
Providing a toll-free phone number	<ul style="list-style-type: none"> In the letter in the second and fourth mailings, there was a toll-free phone number to contact the research coordinator if they have any questions or comments about the survey.
Enclosing a replacement questionnaire	<ul style="list-style-type: none"> A replacement questionnaire was enclosed in the fourth and fifth mailings. Thus, key informants did not have to contact the research coordinator to get another questionnaire.
Enclosing a stamped, addressed return envelope	<ul style="list-style-type: none"> A stamped, addressed return envelope was enclosed in the second, fourth, and fifth mailings.

RESULTS: RESPONSE RATES

Figure 1 shows a similar pattern for the cumulative percentage response rate for both surveys. Not surprisingly, there were few elementary school responses (2%) during the time prior to the reminder postcard mailing (only one week after the questionnaire was initially mailed, which is a limited amount of time to receive and return the questionnaire). The response rate increased from 2% to 43% during the time after the postcard mailing but prior to the replacement questionnaire mailing. The response rate increased from 43% to 76% during the time after the replacement questionnaire mailing but prior to the couriered questionnaire. The response rate increased from 76% to 85%, during the time after the couriered questionnaire to 13 weeks after the first mailing of the questionnaire. The response rates among secondary schools prior to the postcard mailing, prior to the replacement questionnaire mailing, prior to the couriered questionnaire, and 13 weeks after the first mailing of the questionnaire were 1%, 35%, 65%, and 79%, respectively. Thus, both surveys yielded high response rates as suggested by Dillman (2000), and the response rates were similar to those in previous mail surveys of opportunities for physical activity in schools, which used multiple contacts among school staff

(88% in the Barnett, O'Loughlin, Gauvin, Paradis, & Hanley [2006] study; 73% in the O'Hara Tompkins, Zizzi, Zedosky, Wright, & Vitullo [2004] study).

Figure 1
Cumulative Percentage Response Rate Among Elementary and Secondary Schools



Note. The three vertical lines represent the subsequent postcard mailing, replacement questionnaire mailing, and couriered questionnaire, respectively.

The TDM yielded excellent response rates for both surveys, though it is not possible to determine exactly how much of the increased response rate is attributed to specific mailings. Figure 1 shows that more than half of the elementary school questionnaires (54% / 85% = 64%) and secondary school questionnaires (47% / 79% = 59%) were completed and returned within four weeks after the first mailing of the questionnaire (one week after the replacement questionnaire mailing). Also, the couriered questionnaire may have converted good response rates into excellent ones. The response rate for both surveys levelled off one week after the couriered questionnaire (i.e., returned questionnaires during this time may have been in response to the replacement questionnaire mailing) and then increased during the next week (i.e., from 77% to 81% among elementary schools; from 66% to 74% among secondary schools).

LESSONS LEARNED

A lesson learned from these studies is that personalizing the correspondence to make it rewarding for potential respondents to par-

ticipate in the survey and to establish trust among them can take substantial time, effort, and cost. We obtained the school addresses and telephone numbers of the randomly selected schools from the directory that the Ontario Ministry of Education gave us. Then we hired graduate student research assistants to phone each school to explain the purpose of the survey and to request the name and position of the person who is likely to be most knowledgeable about opportunities for physical activity in the school. In general, a school secretary provided this information. In addition, the first author signed each letter and the postcard, which was time-consuming considering the number of potential respondents (i.e., 1,199) and mailings.

Also, by personalizing the correspondence, researchers need to be diligent in implementing the survey. We printed the date on each letter and the postcard, which required us to more closely adhere to survey timelines. Preparing survey materials (e.g., printing and signing letters, stuffing envelopes) for some mailings, while remaining on schedule, was challenging because there were a lot of potential respondents and limited time between some mailings. Thus, the TDM requires that the survey be well coordinated.

We learned that it is important to accommodate potential respondents to maximize the response rate. Some key informants indicated that they could not participate in the survey unless the research ethics board (REB) in their school board reviewed and approved the study. This was a concern to us because some key informants were from different schools in that school board, and therefore others who did not mention the REB would also not be permitted to complete the questionnaire without school board approval. To maximize the response rate, we completed the research application form from four school boards and sent this and documentation of university research ethics approval to conduct the surveys to them. They subsequently provided approval and the key informants returned completed questionnaires. However, accommodating these requests required additional resources and an extension of the survey timelines.

We also accommodated potential respondents by giving them the option of completing the paper questionnaire or completing it online. They preferred the paper version. Only 38 respondents from elementary schools and 18 respondents from secondary schools completed the questionnaire online, which corresponds to 6% of the respondents [i.e., $56 / (512 + 474)$]. We do not know whether this occurred because of their preference, because the Internet was not easily accessible in their school, or for other reasons. Also, it is possible that they would

have completed and mailed the questionnaire if they had not been given the option of completing a web survey. Considering this and the resources that we committed to developing the web survey, we are not convinced that adding the web survey contributed much in maximizing the response rates. This cost needs to be balanced with the possibility that providing choice in the type of survey is an important feature for potential respondents in enhancing survey credibility.

The final contact in the TDM entailed additional costs in that we couriered 148 elementary and 208 secondary school questionnaires ($356 \times \$6.20 = \$2,208$). However, the costs were lower than they would have been if a good response rate had not been obtained just prior to the couriered questionnaire (at this time, the response rate for the elementary and secondary school surveys was 76% and 65%, respectively). Also, the additional costs seem minimal considering that face-to-face interviews and phone surveys can be substantially more expensive. Further, the response rate for both surveys increased noticeably after the couriered questionnaire, which supports the merit of using it.

In addition to maximizing the response rate, we wanted to minimize the amount of missing data to obtain quality responses. Some questionnaires were returned with data missing. We initially attempted to phone respondents to get this information, but it was difficult to reach the respondents and it was too time-consuming. Therefore, pages that had missing data were photocopied and mailed to them to complete. This worked well, as many respondents returned completed pages. However, it lengthened the survey period.

CONCLUSION

Using the TDM strategies in the survey needs assessment yielded high response rates. The strategies were used to establish trust, increase perceived rewards, and decrease perceived costs among key informants. Though there were some challenges in using the TDM, we think that it strengthened our surveys by maximizing the quality of responses and the response rate (Dillman, 2000). We suggest that researchers consider using the TDM in surveys designed to develop and evaluate programs.

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