



ANNOTATIONS

Chocolate frogs do not increase completion of parent survey: Randomised study

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Abstract: Four months into a year-long, national survey assessing parents' experiences of a child's diagnosis of autism spectrum disorder, our response fraction was only 23%. We aimed to determine whether including a chocolate incentive in the postal survey would increase the response fraction. Families enrolled between 15 March and 25 May 2012 were randomised to receive a chocolate frog versus no chocolate frog. Both groups received a written reminder and replacement survey 2 weeks after the survey was posted and up to two telephone reminders thereafter. We analysed the effect of the incentive using χ^2 tests for the categorical response variable and *t*-tests for the continuous reminder and length of response variables at the end of (i) randomisation and (ii) the study (1 November 2012). A total of 137 families were randomised in the 6-week period. Parents who received an incentive were more likely to return a completed survey in the 6 weeks than those who did not (21% vs. 6%, $P = 0.009$). This effect faded by the end of the study (53% vs. 42%, $P = 0.4$). There were no differences between groups at either follow-up in the number of reminders that parents received or the number of days it took parents to return the survey. Including a chocolate-based incentive does not significantly increase response rate in a postal survey over and above standard reminder techniques like posting follow-up survey packs or phoning families.

Key words: incentive; parent survey; randomised control trial; response rate.

A high response fraction for postal surveys can be difficult to achieve but is necessary for sufficient power and to avoid selection bias. Here, we report findings from an Australian Paediatric Research Network (APRN)¹ study which examined whether a chocolate incentive could improve the response fraction for a postal survey.

Four months into a national survey assessing parents' experiences of a child's diagnosis of autism spectrum disorder (ASD),

the response fraction was only 23%. While this is the first APRN survey of parents, previous APRN surveys of paediatricians have achieved response fractions of 50–70%.^{2–4}

A recent Cochrane review identified ways to improve responses to postal surveys.⁵ Of the 17 ways identified, our survey had already incorporated eight (e.g. pre-notification, personalised surveys, follow-up contact). Although the survey topic is of a sensitive nature, it is close to parents' hearts and likely to be considered interesting, which increases participation.⁵ For ethical reasons, we did not add a teaser to the envelope or mention an obligation to respond. Due to time and budget constraints, we did not include monetary incentives, recorded mail delivery, hand-written addresses or use stamped rather than reply-paid envelopes. All that was left was including a non-monetary, cheap and unconditional incentive.

Whether a non-monetary incentive is small (e.g. learning about study results) or large (e.g. lottery participation) tends not to matter.⁵ We chose chocolate because it is appealing to most people, cheap and feasible to send by post. Two large New Zealand studies have tested the effectiveness of chocolate incentives with adults. Gendall *et al.* found a 2.7–5.1% increase in response fraction, but the evidence was weak ($P = 0.1$).⁶ Brennan and Charbonneau found that adding a chocolate bar initially increased the response fraction to 7.3%, but this effect faded with increasing follow-up efforts.⁷

We therefore examined whether chocolate could provide an incentive to parents to complete the survey. We hypothesised

Key Points

- Low participant responses in survey research can reduce power, introduce response bias and limit generalisability of research findings.
- Adding a chocolate frog as an unconditional incentive in survey packs increases the response fraction initially, but the effect fades with increased follow-up.
- It is highly unlikely that the team conducting the research will have chocolate incentives returned, but practical aspects, like cost and ease of postage, should determine the choice of incentive used.

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Conflict of interest: The authors have no conflict of interest to declare.

Accepted for publication 21 January 2014.

Table 1 Response fraction by randomisation status (intervention vs. control) at the end of (i) randomisation and (ii) the study

Survey	At randomisation end		At study end	
	Intervention (frog, <i>n</i> = 70)	Control (no frog, <i>n</i> = 67)	Intervention (frog, <i>n</i> = 70)	Control (no frog, <i>n</i> = 67)
Received, <i>n</i> (%)	15 (21.4)	4 (6.0)	37 (52.9)	28 (41.8)
Reminders, <i>n</i> (%)				
0	10 (14.3)	1 (1.5)	19 (27.1)	17 (25.4)
1	5 (7.1)	3 (4.5)	18 (25.7)	11 (16.4)
Number of days to return, mean (SD)	39.3 (34.1)	34.9 (31.3)	40.5 (31.9)	35.4 (27.0)
Not received, <i>n</i> (%)	55 (78.6)	63 (94.0)	33 (47.1)	39 (58.2)
Reminders, <i>n</i> (%)				
0	43 (61.4)	43 (64.2)	0 (0)	0 (0)
1	9 (12.9)	18 (26.9)	30 (42.9)	37 (55.2)
2	3 (4.3)	2 (3.0)	3 (4.3)	2 (3.0)
Number of days from post to end study, mean (SD)	205.1 (29.0)	213.6 (25.9)	198.3 (31.3)	209.4 (28.8)

that parents who received a chocolate frog would be more likely to return a completed survey than those who did not.

Method

Design

Randomised trial of chocolate frog incentive versus no incentive added to a posted survey pack. Families and the researchers involved in data collection and entry were blinded to group allocation.

Setting

The APRN membership comprises more than 40% of Australian paediatricians registered with the Royal Australasian College of Physicians.⁴ Member characteristics are published elsewhere.² In October 2011, APRN members (SH, CC, CS) initiated the first large-scale survey of ASD service delivery in Australia and how the experience of Australian families might be improved during this difficult time.

Participants

Parents of children aged 18 months to 18 years who had been diagnosed with an ASD since 1 January 2010 and identified as eligible participants between 15 March and 25 May 2012.

Procedure

All APRN members were asked to identify eligible children from their clinic records. Participating paediatricians then mailed parents a pre-prepared letter describing the study and giving families the opportunity to be contacted directly by the study team using an opt-in or opt-out approach (depending on ethics approval for their region). Eligible families were then mailed a survey pack containing information about the study, the 10-page parent survey and a reply-paid envelope. Families who did not return the survey within 3 weeks were mailed another

survey pack. Those that did not return the second survey within a fortnight were reminded by phone call and posted another survey pack if requested.

The only difference between the packs sent to both groups was that intervention packs contained a plain chocolate 'Freddo Frog'. Flavoured 'Freddo Frogs' were considered, but the group was unable to reach a consensus about which would be the most appealing flavour. As the study team did not have access to the medical records of children, chocolate frogs were sent without the knowledge of whether this could be inappropriate due to comorbid conditions such as obesity, allergy or diabetes. However, it was hypothesised that an alternative family member would be identified as suitable to consume the chocolate incentive.

Analysis

All analyses were performed using INTERCOOLED STATA (Stata, College Station, TX, USA) version 11.1 for Windows. Families were individually randomised as they were consecutively identified for eligibility in groups of up to *n* = 65 using the STATA 'ralloc' programme. Reminders were counted as the number of post and telephone reminders performed. Two months into the study (May 2012), we examined whether the incentive was effective and therefore worth offering to all participating families. We re-examined the effect of the chocolate incentive at the end of the data collection period for the ASD survey (1 November 2012). We compared the response fractions between groups using χ^2 tests for proportions.

This study was approved by the Human Research Ethics Committees of The Royal Children's Hospital (#31175A) and Southern Health (#10318B), Victoria.

Results

After 2 months, 137 families participated in this study. At this point, parents who received a chocolate frog were more likely to return a completed survey than those who did not (21% vs.

6%, $\chi^2(1) = 6.8$, $P = 0.009$, see Table 1). We thus finished the randomisation study and included a chocolate frog in all subsequent survey packs. By the end of the ASD survey in November 2012, although 11% more intervention families returned completed surveys than controls overall, the strength of the evidence had faded ($\chi^2(1) = 1.7$, $P = 0.2$).

At the end of randomisation, control families received slightly more reminders (mean 0.37, standard deviation (SD) 0.55) than intervention families (mean = 0.29, SD 0.54), but there was no evidence of a difference ($P = 0.4$). At the end of recruitment, there were no differences between the mean number of reminders for intervention (0.77, SD 0.52) versus control (0.78, SD 0.49) groups, $P = 0.9$. There were no differences at either point for the number of days it took parents to return surveys. Despite the hopes of the research team, no chocolate frogs were returned via the provided reply-paid envelope.

Discussion

Initially, parents who received a chocolate incentive were more likely to return a completed survey, but this effect faded with ongoing follow-up strategies. These findings are consistent with Brennan *et al.*, who found an initial 7.1% improvement but less improvement with each subsequent follow-up.⁷ However, in contrast with the two existing comparison studies, the chocolate incentive in our study appears less influential than additional follow-ups.

A strength of this study is that participants and researchers were blinded to randomisation. Although the 11% difference in response fraction at the end of the study is considerable, the sample size is too small to provide evidence for a difference. A larger study is needed to verify whether a chocolate incentive independently improves the overall response fraction, regardless of reminders.

Future research could examine whether flavoured versus plain chocolate is a more effective incentive. Researchers should not choose the type of chocolate incentive based on their own personal preferences as it is extremely unlikely that any will be returned.

Acknowledgements

We thank all APRN paediatricians and families for taking part, and Hayley Crawford for her help with recruitment and data collection.

Sources of funding and support

This study was funded by the Scobie and Claire Mackinnon Trust and Southern Health. AP was supported by NHMRC Population Health Capacity Building Grant #436914 and HH by NHMRC Career Development Award 607351. The Murdoch Childrens Research Institute (MCRI) administered the grants and provided infrastructural support to its staff but played no role in the conduct or analysis of the trial. MCRI research is supported by the Victorian Government's Operational Infrastructure Support Program.

Author contributions and access to data

SH, CC and CS conceived the original study with APRN guidance from HH. AP, LS and EY collected the data and conducted the analysis. AP, CC, CS, HH, LS, EY and SH wrote the manuscript. All authors had full access to all of the data (including statistical reports and tables) in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. AP is the guarantor.

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