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Is a “Wage-Payment” Model for Research Participation Appropriate for Children?

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ABSTRACT

OBJECTIVE. Our goal was to evaluate the applicability of a “wage-payment” model to inducements for children to participate in research.

SUBJECTS AND METHODS. We interviewed 42 children and adolescents between the ages of 4 and 16 years who had diabetes, asthma, seizures, or no chronic medical condition. The interview explored hypothetical participation decisions for up to 4 research scenarios. To evaluate factors that would influence children and adolescents’ decision-making for research participation, we probed for the impact of monetary and other incentives. The interviews were transcribed and coded for specific themes related to money or other rewards and incentives.

RESULTS. Older children, mainly those >9 years of age, showed an appreciation for the role and value of money through (a) an accurate concept of the material value of money in society or (b) asking for a realistic amount of money in exchange for their research participation. Younger children, primarily those <9 years of age, showed an inability to appreciate the role and value of money by: (a) asking for excessive monetary amounts that bore no relationship to the sum warranted by participation; (b) having no concept of what that money could buy; (c) not comprehending the meaning of a wage as earning a reward for working; or (d) justifying proposed amounts with reasons unrelated to the time and effort involved.

CONCLUSIONS. An age-appropriate token of appreciation as an inducement for research participation is appropriate for the younger child who is <9 years old, because they generally have an inadequate understanding of the value of money and, therefore, the meaning of a wage. A wage-payment model for compensating older children (>9 years of age) and adolescents for the time and effort of research participation is appropriate because they generally understand the meaning and value of a wage.
Researchers frequently offer payment as an encouragement for individuals to participate in clinical trials in an effort to reach the required study enrollment goal. Such payments generally fall into 2 categories: reimbursement and inducement. Reimbursement refers to payments that remove financial deterrents to research participation by reimbursing for out-of-pocket expenses. Inducement refers to payments that may encourage an individual to participate in the research.\(^1\) Inducements can be differentiated further into 3 types: appreciation, compensation, and incentive payments.\(^1\) Appreciation payments are given after completion of the research to thank the person for participating, whereas compensation pays participants for the time and inconvenience of research participation. The third type, an incentive payment, is offered to secure the needed number of participants for the research project.\(^2\)

The dollar amount of the inducement depends on the type, with appreciation payments generally being less than compensation or incentive payments.

Data on the practices of paying children for participation in research are limited. One report indicated that 25\% of pediatric trials offered payments ranging from $25 to $1500.\(^2\) Another report found that 66\% (84 of 128) of institutions conducting pediatric research offer payments of some form. Among these 84 institutions, some payments for children’s participation exceeded the value of a token of appreciation or reimbursement for expenses. However, the survey did not distinguish between compensation and incentive payments. The most common method of payment was money, with the majority (42\%) approving payments for both the child and parent or guardian and 19\% for the child alone.\(^3\) A survey of 120 authors of studies published in 1999 and involving adolescent subjects found that 55\% used payments to the adolescent for participation, of which 50\% were cash. The amount of payment and the complexity of the protocol did not seem to be related, making it difficult to establish how the level of compensation was calculated.\(^4\) For a single nontherapeutic blood test, 53\% of institutional review board chairpersons found reimbursement to the child for the time and inconvenience of participation acceptable, 18\% found it unacceptable, and 28\% would allow such reimbursements under some conditions. Offering a $10 incentive to the child for this same blood test was acceptable to 29\% of the institutional review board chairpersons, with 18\% allowing an incentive payment under some conditions.\(^5\) Thus, the full range of financial inducements (appreciation, compensation, and incentives) seem to be represented in the limited data that exist.

The main ethical concern about incentive payments is that such payments may unduly influence potential participants to enroll in research. The basis for this concern is that the desire for money may supplant one’s better judgment such that the participant’s own welfare may not receive the necessary attention. In the Belmont report (1979)\(^6\), the National Commission defined undue influence as occurring “through an offer of an excessive, unwarranted, inappropriate, or improper reward or other overture to obtain compliance.” Since then, general and pediatric-specific guidelines have been offered.\(^7,8\) Nonetheless, institutional review boards are left with unclear criteria for how to determine whether money is an “undue” influence, because little is known about the conditions under which monetary payment inappropriately influences potential participants to enroll in research.\(^9\) As a result of this ambiguity, some have called for the removal of incentive payments altogether.\(^10\)

Alternatively, some have sought to articulate an ethical approach to monetary inducements to optimize recruitment while minimizing undue influence. One such approach is the wage-payment model, which generally establishes the amount of an inducement by using an hourly wage and an estimated time for completing the research task. Although the calculation is time-based, the inducements are linked to the research task. The wage-payment model is consistent with either compensation or incentive payments depending on how an appropriate hourly wage is established. Increasing the hourly wage to whatever level necessary to ensure adequate enrollment would be an incentive payment. Concerns about undue influence may be heightened if this higher wage reflects increased risk exposure. To offset the possibility of undue influence, proponents of the wage-payment model argue for compensating participants as they would be for a low-wage, unskilled yet essential job.\(^11\) This approach implicitly emphasizes the autonomy of competent decision-makers, allowing participants to evaluate the drawbacks and benefits of research participation, just as laborers weigh the time and effort of working against the rate of pay.\(^12\)

But is a wage-payment model applicable to pediatrics? Clearly, the appropriateness of such a model relies on the prospective participant’s understanding of the meaning of a wage. A wage for research participation reflects payment of a given sum based on the time spent participating, thus assuming the operational concepts of both money and time.\(^8\) Because certain social and cognitive capacities do not fully develop until adolescence or adulthood, a child’s concepts of money and time are less well-established than those of an adult.\(^13,14,15\) Thus, the suitability of a wage-payment model for pediatric research may be called into question. We assessed the wage payment model’s applicability to research involving children through exploring their concept of money as an inducement for research participation and how this concept may vary with a child’s cognitive development.
SUBJECTS AND METHODS
We performed an analysis of interview transcript data originally collected for a qualitative research project exploring parent permission and child assent for research participation. The participants were 48 children and adolescents between the ages of 4 and 16 years who had diabetes, asthma, seizures, or no chronic medical conditions. The parent project included 21 parent interviews, but those data are not relevant to this article. Children were interviewed after obtaining verbal parental permission and child assent. The study was approved by the institutional review board at the Children’s Hospital of Philadelphia.

In an effort to evaluate factors that would influence children and adolescents’ decision-making for research participation, we probed for the impact of monetary and other incentives for research participation. Children were asked to make hypothetical participation decisions for up to 4 research scenarios: (a) a single blood draw (BD); (b) a pharmacokinetic study with an in-dwelling catheter for multiple blood draws (PK); (c) a randomized placebo-controlled trial (RPCT); and (d) a nontherapeutic bronchoscopy performed while under general anesthesia for an unrelated and clinically necessary surgical procedure (NTB). If the child expressed a willingness to participate without any inducement, a monetary incentive was not discussed for a given scenario. When a child was inclined to refuse participation, he or she was asked whether an incentive (including type and monetary value) could change his or her mind. Thus, not all children and adolescents responded to questions of incentives for every scenario. In total, there were 94 instances in 42 (87.5%) of 48 child and adolescent interviews in which the influence of money and other incentives was discussed. The results reported here are from the analysis of the interviews of these 42 children who ranged in chronological age from 5 to 15 years.

The overall interview lasted approximately an hour, was audio-recorded, and transcribed, checked for accuracy, linked to demographic data (eg, age, disease group), and then rendered anonymous. After the interview, the children were administered the Peabody Picture Vocabulary Test (PPVT). The PPVT is a measure of receptive language ability and was used as a proxy for intellectual maturity.16 The interviews, demographic data, and PPVT data were imported into N-Vivo 2.0 software for analysis.17 The qualitative analysis of these interview data included repeated, close readings of transcripts to develop preliminary codes, which, as data accumulated, were adapted into a formal coding structure; memo writing; thematic coding aided by qualitative analytic software; conferencing between investigators to ensure reliability of interpretation; and matrix analyses for reducing and comparing aspects of the data.18 A number of interviews were coded by 2 individuals (Drs Reynolds and Nelson) to ensure consistency and agreement in overall coding, and then all interviews were coded by 1 individual (Dr Reynolds). Data collection and analysis occurred simultaneously and, as themes emerged, these data influenced the process of subsequent interviews, suggesting new probes and questions to prompt greater depth and richness in respondents’ answers.18 The number of interviews was determined by whether or not thematic saturation (ie, identification and organization of themes such that no new information seems to be apparent) was reached.19

The interviews were coded for specific themes related to money or other rewards and incentives. These codes or categories included “reason for wanting money,” “mechanism of payment,” “influence of money,” and “amount of adequate reimbursement.” The coding of the identified interview selections were rereviewed by all 3 authors (Mr Bagley and Drs Reynolds and Nelson), and full agreement on interpretation and coding was reached through discussion. The identified text selections were then organized by 3 criteria that might influence a child’s attitude toward research incentives: (a) age equivalent (as determined by the PPVT), (b) research scenario, and (c) the child’s disease. Among these criteria, only age seemed related to how children talked about money and incentives, thus, the remainder of the analytic work focused on identifying whether or not money and incentives were perceived differently by children in different age groups. The identified texts related to money and incentives were further organized to evaluate several factors and their relationship to the age of the child. These included (a) reasons given by children regarding why they believed participation was worth a particular amount, (b) what they planned to spend the money on, and (c) their overall understanding of the role of money in society.

RESULTS
The results are presented in Table 1. The children were divided into 2 groups based on achieving thematic saturation: children < 9 years of age (based on the PPVT) who were unable to appreciate the role and value of money; and children > than 9 years of age (based on the PPVT) who were able to appreciate the role and value of money. Under each of these 2 groups, the first column describes subthemes identified in the qualitative analysis, with illustrative quotations or paraphrases found in the third column. Each quotation or paraphrase in the third column represents a unique child. A child is represented only once in the table. The scenario that was being discussed when the child made the remark is given in the second column. The table is arranged roughly in ascending order of age (fourth column) based on the results of the PPVT. Of the 42 children, 20 stated that they would not be influenced by money, with the remaining 22 children represented in Table 1. The younger children (< 9 years; n = 5) who said they would not be
influenced by money perceived the procedure would hurt, and they did not want the pain. The older children (≥9 years; n = 15) who would not be influenced by money had reasonable explanations indicating an understanding of money and, therefore, were asked few clarifying questions.

As shown in Table 1, the younger children generally demonstrated an inability to appreciate the role and value of money by (a) asking for monetary amounts that were excessive and bore no relationship to the sum actually warranted by participation, (b) having no concept of material worth, ie, what that money could buy, (c) not comprehending the meaning of a wage as earning a reward for working, or (d) justifying the proposed amounts with reasons unrelated to the time and effort involved. In contrast, the older children generally demonstrated an appreciation for the role and value of money through (a) an accurate concept of the material value of money in society or (b) asking for a realistic amount of money in exchange for their research participation. In effect, there seems to be a transition around 9 years of age in the ability of the children interviewed as

<table>
<thead>
<tr>
<th>Qualitative Theme</th>
<th>Scenario</th>
<th>Quote or Paraphrase</th>
<th>Age*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Younger group (&lt;9 y): Unable to appreciate role and value of money</td>
<td>BD</td>
<td>$18 &quot;because I was counting&quot;</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>PK</td>
<td>$68 because it’s her &quot;lucky number.&quot; Also requested &quot;a million dollars&quot;</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>BD</td>
<td>$10: Incoherent explanation for amount requested: &quot;I paid you because I’m going to pay you because I, that’s the, something falls on it, on the pointy side, and then do it so it won’t hurt me.&quot;</td>
<td>7</td>
</tr>
<tr>
<td>Child does not understand the meaning of a wage, ie the connection between working and earning a reward</td>
<td>NS</td>
<td>Says that researchers should not offer toys. When asked to explain, child responds with &quot;A toy is something to play with&quot;, and &quot;if (you) gave them a toy, they would want to play with it.&quot; Child goes on to state that &quot;(research) is not about playing. It’s about working... working like when you draw and stuff ... and what you’re supposed to do.&quot;</td>
<td>7</td>
</tr>
<tr>
<td>Amount of money requested excessive and not warranted by participation</td>
<td>NTB</td>
<td>“biggest number that you ever can count to”</td>
<td>7</td>
</tr>
<tr>
<td>Poor concept of the value of money in society; cannot correlate a given amount of money with its material worth</td>
<td>PK/BD</td>
<td>Refuses to participate with no incentive. When offered an incentive ($91), changes mind and accepts it, expressing intent to buy a car with the money; would also accept $85 so he &quot;could get a motorcycle&quot;</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>BD</td>
<td>Wants more than 25 cents but not more than a hundred dollars, but then goes off on tangential subjects.</td>
<td>8</td>
</tr>
<tr>
<td>Overlap (unrealistic amount, poor concept)</td>
<td>BD</td>
<td>First says &quot;a million,&quot; later says “my dad could pay the other $60 I could get a Dodge Viper. No, another $80, so then I could get a remote control Dodge Viper as big as this table is wide.”</td>
<td>12</td>
</tr>
<tr>
<td>Older group (≥9 y): Able to appreciate role and value of money</td>
<td>PK</td>
<td>“I just have one dollar, and you can hardly buy anything with one dollar”</td>
<td>11</td>
</tr>
<tr>
<td>Accurate concept of the value of money in society</td>
<td>RPCT</td>
<td>$100 to compensate him for his time</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>NTB</td>
<td>Any number between $10 and $100</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>NTB</td>
<td>$25 or $30</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>NTB</td>
<td>$100</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>NTB</td>
<td>“About $250... to $300”</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>NTB</td>
<td>$50</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>BD</td>
<td>$20 or $25</td>
<td>11</td>
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<tr>
<td></td>
<td>RPCT</td>
<td>$100</td>
<td>13</td>
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<tr>
<td></td>
<td>PK</td>
<td>$20</td>
<td>14</td>
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<tr>
<td></td>
<td>NTB</td>
<td>$75</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>RPCT</td>
<td>$50</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>BD</td>
<td>“Ten, fifteen bucks”</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>PK</td>
<td>“Something over $30”</td>
<td>22+</td>
</tr>
</tbody>
</table>

NS indicates no specific scenario.

* Age-equivalent according to PPVT, rounded to nearest year.
DISCUSSION
If compensation for participation in research is viewed as a low-wage job, the research participant should understand several key concepts concerning the role and value of money. These essential concepts include (but are not limited to): (a) an understanding of how one earns or obtains money, (b) the ability to correlate a given amount of money with its material worth, and (c) the capacity to discern what is fair payment for performing a given task for a certain amount of time. Absent such understanding, a participant may be unable to comprehend accurately the financial rewards of participation. Thus, the impact of an otherwise reasonable amount of money on the decision to participate may be unpredictable and raise doubts about whether such a participant is capable of making an adequately voluntary decision. If so, a wage-payment model of compensation would be ethically less appropriate as an inducement for research participation. Our data (Table 1) suggest that children who are <9 years of age generally have problems appreciating the role and value of money, thus placing the appropriateness of a wage-payment model for the research participation of younger children in doubt.

An understanding of how one obtains money or material value through work is required for a child to fully comprehend a wage. According to a study by Bertii and Bombi20, children do not understand that work is the primary source of money until the age of 7 to 8 years. Thus, only when children reach this age range can they perceive research participation in exchange for money as performing a job for a wage. Younger children <7 to 8 years of age are less inclined to view work as a means of earning the materials they desire. For example, one 6-year-old child refused to accept a toy in exchange for research participation (Table 1). When asked for an explanation, the child was unable to link receiving the toy to the work of research participation. Thus, for such a child a wage-payment model would have little relevance.

The appropriate use of a wage-payment model also requires a participant’s ability to equate accurately a given amount of money with its material worth. If a child has an inaccurate concept of what can be purchased with a certain amount of money, then the compensation may be seen as excessive or insufficient from the child’s perspective. For example, another 6-year-old child expressed interest in participating in the pharmacokinetic study in exchange for $91 (Table 1). Although this amount seems reasonable in light of the time and effort involved, the child wanted the money to purchase a car or motorcycle. Strauss14 has described 9 levels of a child’s understanding of money. At level I, for which the average age is 5 years and 4 months, Strauss found that children believe that any amount of money can buy any object. As with this 6-year-old child, any amount of money may then present an excessive reward to a child; participation in research may seem well worth the valuable reward that they believe they will collect, regardless of the risks or disadvantages of participation. The child’s lack of appreciation of the true value of money may render even a reasonable amount of money by adult standards an undue influence for some younger children. Because younger children are unable to evaluate a monetary wage in exchange for work, a wage-payment model is not an acceptable approach to compensation for research participation. In contrast, older children (>9 years of age) mentioned purchases such as dolls or toys that reflected an accurate assessment of the purchasing power of a monetary inducement (Table 1). Thus, a wage-payment model may be more appropriate for older children as an inducement for research participation.

Finally, the wage-payment model presupposes the capacity to recognize what is an appropriate payment for a given job. The older children (>9 years of age) requested reasonable amounts of money, whereas the younger children (<9 years of age) tended to ask for amounts far greater than that warranted by the anticipated research participation. Although several younger children suggested appropriate amounts of payment, they proposed the amounts for reasons that were unrelated to the proposed research (Table 1). In general, children younger than 9 years of age cannot appropriately assess the monetary value of research participation based on the time and effort involved, suggesting that a wage-payment model for compensation may not be appropriate.

Alternative approaches to a wage-payment model of compensation as an inducement for a child’s participation in research have been suggested. One suggestion is to pay children less than adults to minimize any undue influence on a child’s decision to participate.21 This approach, however, may be inappropriate both for the younger child who lacks an understanding of the value of money and for the older child who, possessing such understanding, may perceive a lower wage as unfair. Another recommendation is to offer an age-appropriate nonmonetary gift to the child after completing participation as a token of appreciation.2,8 Our results suggest that using an age-appropriate token of appreciation as an inducement is appropriate for the younger child who is <9 years old because they have an inadequate understanding of the value of money, and, therefore, the meaning of a wage. A wage-payment model for compensating older children (>9 years of age) and adolescents for the time and effort of research participation is...
appropriate because they generally understand the meaning and value of a wage. These results are consistent with previously reported data on children’s understanding of money, although drawn from a limited sample size (making it difficult to determine the precise developmental boundary between younger and older children, as illustrated by the one child who failed to fit the general pattern). In addition, a child’s parents may also have strong preferences about the form, amount, and timing of an inducement for a child’s research participation. Nevertheless, our results offer empirical support for offering younger children a token of appreciation and older children and adolescents an appropriate wage for the time and effort of research participation.

REFERENCES
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