Source Credibility and Idea Improvement Have Independent Effects on Unconscious Plagiarism Errors in Recall and Generate-New Tasks

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Unconscious plagiarism occurs when people try to generate new ideas or when they try to recall their own ideas from among a set generated by a group. In this study, the factors that independently influence these two forms of plagiarism error were examined. Participants initially generated solutions to real-world problems in 2 domains of knowledge in collaboration with a confederate presented as an expert in 1 domain. Subsequently, the participant generated improvements to half of the ideas from each person. Participants returned 1 day later to recall either their own ideas or their partner’s ideas and to complete a generate-new task. A double dissociation was observed. Generate-new plagiarism was driven by partner expertise but not by idea improvement, whereas recall plagiarism was driven by improvement but not expertise. This improvement effect on recall plagiarism was seen for the recall-own but not the recall-partner task, suggesting that the increase in recall-own plagiarism is due to mistaken idea ownership, not source confusion.

Keywords: unconscious plagiarism, idea improvement, source credibility, recall-own, recall-partner

Anecdotal evidence from colleagues indicates that many psychologists have been involved in disputes, varying in seriousness, over the origin of an idea. In the present article, we demonstrate two different psychological bases for the origin of such errors and show that these can be dissociated.

The first experimental study of unconscious plagiarism was conducted by Brown and Murphy (1989), who developed the basic three-stage procedure that has formed the basis for much of the subsequent research. This paradigm has been used on numerous occasions to demonstrate that people will often appropriate other people’s ideas when trying to recall their own ideas and duplicate old ideas when attempting to be novel (e.g., Bink, Marsh, Hicks, & Howard, 1999; Brown & Halliday, 1991; Brown & Murphy, 1989; Landau & Marsh, 1997; Macrae, Bodenhausen, & Calvini, 1999; Marsh & Bower, 1993; Marsh & Landau, 1995; Marsh, Landau, & Hicks, 1997; Stark & Perfect, 2006, 2008; Stark, Perfect, & Newstead, 2005; see Perfect & Stark, 2008a, for a recent review). The methodology consists of an initial generation phase in which groups of participants took turns individually generating solutions to a problem. Subsequently, participants worked individually on two retrieval tasks: a recall-own task where they were instructed to recall their own previous ideas, not intruding ideas from anyone else, and a generate-new task in which they had to generate further solutions, avoiding previously given solutions. Plagiarism errors occurred on both tasks.

The first theoretical account of the two forms of plagiarism was developed by Marsh and Landau (1995), who proposed a two-threshold signal detection model. Their model rests on two key assumptions. The first is that after the initial generation phase, self-generated items have more strength than do items generated by others. The second is that participants make two discriminations: a lower threshold used to distinguish old from new items and a higher threshold to distinguish self-generated from other-generated ideas. Recall-own plagiarism occurs when an idea generated by someone else comes to mind at retrieval with sufficient strength to cross the higher threshold. Generate-new task plagiarism occurs when an old item comes to mind during the generate-new task with insufficient strength to cross the lower threshold.

However, this strength-based model has since been rejected as an account of recall-own plagiarism because manipulations of item strength have a differential effect on correct recall and recall-own plagiarism. In a series of studies based on the Brown and Murphy (1989) three-stage paradigm, Stark and Perfect have looked at the effects of elaboration of ideas during the retention interval (Perfect & Stark, 2008b; Stark & Perfect, 2006, 2008; Stark et al., 2005). In the elaboration phase, a subset of the generated ideas is represented and participants either imagine or improve each idea. Across a series of studies, the results are highly consistent. Compared with performance on control items, recall was higher for both improved and imagined ideas, but there was no difference between the items on the rate of generate-new plagiarism. However, plagiarism on the recall-own task is increased by improvement but not by imagery. Stark and Perfect have argued for a source-memory–based explanation of the recall-own data (Johnson, Hashtroudi, & Lindsay, 1993), arguing that improvement and imagery have effects that differ qualitatively rather than quantitatively. In particular, Stark and Perfect (Perfect & Stark, 2008b; Stark & Perfect, 2006, 2008; Stark et al., 2005) have argued that idea improvement involves a generative process that resembles initial idea generation, and later, during recall, it is this similarity that causes the plagiarism of others’
ideas. Thus, a strong claim arising from this line of work is that improvement of other people’s ideas causes a mistaken sense of idea ownership.

In the present work, we develop this line of research in two ways. First, we test whether the improvement effect reported in the studies by Stark and Perfect (Perfect & Stark, 2008b; Stark & Perfect, 2006, 2008; Stark et al., 2005) is really due to a mistaken sense of idea ownership or just to poorer source memory. Second, we turn our attention to the other aspect of the strength-based model of plagiarism, namely, plagiarism on the generate-new task. We discuss each in turn.

To properly test Stark and Perfect’s claims (Perfect & Stark, 2008b; Stark & Perfect, 2006, 2008; Stark et al., 2005), we need to address a shortcoming of the standard three-stage paradigm as a measure of plagiarism. In all previous studies, participants are asked only to recall their own ideas but not their partners’ ideas. This design measures any source error that leads to ideas being attributed to the self, but it does not measure any source error that leads to the idea being attributed to someone else because those responses are not sought. Consequently, interpreting the increase in plagiarism rate after idea improvement is problematic. It could be due to an increased sense of ownership, as Stark and Perfect have claimed, or, alternatively, it could just reflect poorer source memory in general. The critical missing comparison is what happens when participants attempt to recall their partners’ ideas rather than their own. In this case, a mistaken sense of idea ownership and poor source memory lead to opposite predictions. Mistaken idea ownership would predict a reduction in source errors on a recall-partner task, because participants would be less likely to attribute the ideas to their partner, having already claimed them as their own. In contrast, if improvement merely causes poorer source memory, then it should increase the number of source errors in the recall-partner condition just as it does on the recall-own task. Thus, the present study contrasts a condition in which participants engage in a recall-own task with a condition in which they engage in a recall-partner task.

In contrast to the focus on recall-own tasks, the claim that generate-new plagiarism is purely a result of subthreshold memory strength has gone largely unchallenged. Here, we follow up on a recent effect reported by Perfect and Stark (2008b) that does challenge this view. The starting point for their study was a demonstration of the influence of source credibility on generate-new plagiarism by Bink et al. (1999). Across three experiments, participants read solutions to how traffic accidents could be avoided, presented as coming from either college freshmen or traffic planners. In fact, all of the ideas were generated in a pilot study and matched for idea quality. In Experiment 1, participants subsequently generated their own solutions to the traffic problem and plagiarized the traffic planners more often (15%) than they did the freshmen (8%). However, Experiment 2 found no difference in ability to recall the ideas from each source. In Experiment 3, participants generated an implication for each problem and plagiarized the traffic planners more often (15%) than their own. In this case, a mistaken sense of idea ownership would be due to an increased sense of ownership, as Stark and Perfect have claimed, or, alternatively, it could just reflect poorer source memory in general. The critical missing comparison is what happens when participants attempt to recall their partners’ ideas rather than their own. In this case, a mistaken sense of idea ownership and poor source memory lead to opposite predictions. Mistaken idea ownership would predict a reduction in source errors on a recall-partner task, because participants would be less likely to attribute the ideas to their partner, having already claimed them as their own. In contrast, if improvement merely causes poorer source memory, then it should increase the number of source errors in the recall-partner condition just as it does on the recall-own task. Thus, the present study contrasts a condition in which participants engage in a recall-own task with a condition in which they engage in a recall-partner task.

Unfortunately, the authors do not provide enough details about the experimental procedures. However, the results are presented in a clear and concise manner. The authors discuss the implications of their findings and suggest future research directions. Overall, the paper is well-written and provides valuable insights into the mechanisms underlying plagiarism.
Method

Participants

Forty-four undergraduate students from the University of Plymouth, Plymouth, United Kingdom, participated for partial course credit, for payment of £10 (approximately $18), or on a voluntary basis. None were students studying programs associated with health or the environment. No further demographic information was collected. Half of the participants were allocated to a recall-own task and half to a recall-partner task. All participants subsequently completed a generate-new task. However, data from 4 participants were excluded on the basis of a poor response rate on either the recall task (3) or the generate-new task (1). All 4 of these participants were in the harder of the two conditions: the recall-partner condition.

Materials

Pilot work was conducted with undergraduate students to develop suitable questions to use and to generate appropriate answers for the confederate to use. This resulted in two topics being selected, health and environment, each consisting of three questions. For each question, the confederate learned a script of up to eight answers (four responses plus four spares in case substitution was necessary to avoid duplicating a response), selected by the experimenters from the pool of responses given in the pilot work (see Appendix for a full list of the materials used).

Procedure

The procedure is represented schematically in Figure 1. Participants arrived at the laboratory in pairs consisting of 1 participant and a confederate. The experimenter asked each person in turn to state the course he or she was currently studying and which year of study he or she was in. This enabled the confederate to indicate that he or she was a master’s student (equivalent to a 4th year of study) in environmental science or health, nutrition, and fitness, thus cuing their topic of expertise to the participant. Both courses are currently taught at the University of Plymouth. In addition, the experimenter asked each member of the pair if he or she had any particular hobbies or interests relevant to health or the environment; No participant reported any such interests, and so all were regarded as novices in the two domains.

For the generation phase, the experimenter read out each question individually and the participant and confederate were asked to alternate in giving solutions to the problem until each had given four responses, taking care not to reproduce an already given answer. This part of the task was self-paced. The same fixed order of questions was used throughout, but the order of responding was counterbalanced across questions. (E.g., for Question 1, the confederate gave the first response, and for Question 2, the participant responded first, and so on for all questions, with the reverse order being used for alternate participants.) The confederate generated ideas in a fixed order from a prelearned script, based on answers given in the pilot study. If a participant generated one of the ideas from the script, the confederate replaced that idea with a substitute from the pilot study (see Appendix for the list of questions and the responses provided in the order they were used). The experimenter wrote down each of the ideas produced. Half of the questions concerned health, and half concerned environmental issues. No duplicate ideas were produced by participants in the initial generation phase.

In the improvement phase, the experimenter told the participants that they would hear some of the generated ideas again, and, for each idea, they were asked to write down one way in which the solution could be improved or made more feasible in the response booklet provided. The items selected for improvement were pre-
sent in a fixed random order with respect to the order of generation but alternated across successive participants, such that the an item selected for improvement by one participant would serve as a control item for the next. Each idea was presented individually at a rate set by the participant, who indicated when he or she was ready to hear the next idea. Ideas presented in this fashion were presented in blocks by topic, such that participants first improved ideas associated with environment then ideas associated with health. Half of the presented ideas came from the participant and half from the confederate. Of these, half were from the topic for which the confederate was an expert, and half were from the topic for which the confederate was a novice.

One day later, the participants returned to be tested. Half of the participants were asked to recall only the ideas that they had initially generated, avoiding ideas presented by their partner (the recall-own condition), and half were asked to recall only their partner’s ideas, avoiding ideas that they had generated themselves (the recall-partner condition). Participants were given a response sheet on which were printed the six original questions together with four blank spaces under each, and participants wrote their responses in the spaces provided at their own pace. Participants were informed that they did not have to fill in all the spaces and that they should not guess if they were not certain.

Finally, participants were given a second response sheet, again listing the original questions. However, this time each question was followed by two blank spaces and participants were asked to generate two new answers to each of the six original questions, avoiding any of the answers from the first session. Thus, participants were asked to generate up to six new ideas to questions for which their previous partner was an expert or a novice.

Results

Our focus in the present study is on the level of plagiarism observed in the recall and generate-new tasks. However, because we did not force recall output, this meant that baseline levels of responding complicate the interpretation of the plagiarism data. Consequently, we adopted two strategies. First, we excluded participants whose mean report rate was more than 2 standard deviations below the group mean on either measure. On this basis, we excluded 3 participants for low response rate on the recall task and 1 participant for low response rate on the generate-new task. All came from the recall-partner condition. Second, plagiarism was measured as a proportion of ideas output by each participant, separately for each retrieval task, on the recall and generate-new tasks separately, as detailed in Figure 1.

Correct Recall

The number of correct items recalled from the generation phase were subject to a 2 (task: recall-own vs. recall-partner) × 2 (partner expertise: novice or expert) × 2 (idea improvement: control vs. improved ideas) analysis of variance. The data are shown in Table 1. There was a main effect of task, with more own ideas than partner ideas recalled ($M = 15.05$, $SD = 4.09$, vs. $M = 12.56$, $SD = 3.07$, respectively), $F(1, 38) = 4.56$, $p < .05$, $MSE = 3.36$. There were also more improved ideas than control ideas recalled ($M = 17.0$, $SD = 4.30$, vs. $M = 10.86$, $SD = 4.52$, respectively), $F(1, 38) = 94.6$, $p < .001$, $MSE = 1.05$. Partner expertise had no impact on correct recall, either as a main effect or in any interaction, including the three-way interaction, $F < 1$ in all cases. The interaction between elaboration and task was significant, $F(1, 38) = 6.70$, $p = .05$, $MSE = 1.05$. Tests of simple main effects indicated that the effect of idea improvement was reliable for both recall-partner, $F(1, 38) = 68.9$, $p < .001$, and recall-own tasks, $F(1, 38) = 28.3$, $p < .001$.

Wrong-Source Intrusions in the Recall Task

Of more interest were the occasions when participants accidentally produced an item from the wrong source during recall, shown in Table 1 as the proportion of old ideas output at test. These wrong-source intrusions were equally likely for the recall-partner task (24.2%, $SD = 20.6%$) and the recall-own task (28.3%, $SD = 14.5%$), $F < 1$. There was no main effect of partner expertise and no interactions involving partner expertise, including the three-way interaction, $F < 1$ in all cases. There was no main effect of idea improvement, $F < 1$, but there was an interaction between idea improvement and task, $F(1, 37) = 10.76$, $p < .01$, $MSE = 0.032$, as illustrated in Figure 2. This interaction provides the critical test of whether improvement causes an increased sense of idea ownership or just poorer source memory. In line with the idea-ownership idea, tests of simple main effects revealed that idea improvement increased wrong-source intrusions in the recall-own task, $F(1, 37) = 5.63$, $p < .05$, but decreased such intrusions in the recall-partner task, $F(1, 37) = 5.30$, $p < .05$.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>The Absolute Level of Correct Recall and the Rate of Wrong-Source Intrusions on the Recall Tasks as a Function of Partner Expertise and Idea Elaboration</th>
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<tbody>
<tr>
<td></td>
<td>Control</td>
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<td></td>
<td>Novice</td>
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<td>Task and recall</td>
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<tr>
<td>Recall-own</td>
<td></td>
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<tr>
<td>Correct recall</td>
<td>3.32</td>
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<tr>
<td>Wrong source intrusions</td>
<td>21.7%</td>
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<tr>
<td>Recall-partner</td>
<td></td>
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<tr>
<td>Correct recall</td>
<td>2.11</td>
</tr>
<tr>
<td>Wrong source intrusions</td>
<td>26.4%</td>
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</table>
Participants produced an average of 11.78 (SD = 0.58) responses on the generate-new task, of which 2.87 (SD = 1.86) were reproductions of ideas generated in the previous session, an overall plagiarism rate of 24.4% (SD = 15.5%). This plagiarism rate was subject to a 2 × 2 (idea improvement: control vs. improved ideas) analysis of variance. The mean rates of plagiarism are shown in Table 2. For own ideas, there was an effect of idea improvement, with plagiarism rates of 18.4% (SD = 2.3%) for control ideas and 29.6% (SD = 2.5%) for improved ideas. For partner ideas, there was also an effect of idea improvement, with plagiarism rates of 18.4% (SD = 2.5%) for own ideas and 30.4% (SD = 3.2%) for partner’s ideas. However, there was no main effect of expertise, $F(1, 39) = 1.24, p = .27, MSE = 0.002$. There was a robust interaction between expertise and source, $F(1, 39) = 18.32, p < .001, MSE = 0.002$, as illustrated in Figure 3. Tests of simple main effects on the interaction indicated that for self-plagiarism, there was no effect of expertise, $F(1, 39) = 1.30, p = .26$, but for partner plagiarism, errors were more frequent for the topics on which the partner was an expert, $F(1, 39) = 23.4, p < .001$. There was also an interaction between expertise and elaboration, $F(1, 39) = 6.51, p < .05, MSE = 0.003$. Follow-up tests indicated that for control ideas, participants were more likely to plagiarize the expert ideas, $F(1, 39) = 12.38, p < .001$, whereas for improved ideas, there was no effect of expertise, $F < 1$. The interaction between source and elaboration was nonsignificant, $F(1, 39) = 3.48, p = .07, MSE = 0.008$. There was no three-way interaction, $F < 1$.

**Discussion**

This study had two major innovations compared with previous studies of unconscious plagiarism. First, it involved a recall-partner task as well as a recall-own task to determine whether the previous effects of improvement on unconscious plagiarism rates were due to a generalized impairment of source monitoring or the result of a mistaken sense of ownership. Second, with regard to the generate-new task, this study was the first to use a manipulation of source expertise during the generation phase.

With respect to the recall task, the data strongly indicated that idea improvement increases the sense of idea ownership rather than generally decreasing source monitoring accuracy. In the recall-own task, improvement increased the rate of unconscious plagiarism, replicating numerous previous demonstrations of this effect. However, on the recall-partner task, improving ideas led to less plagiarism, thus reversing the previously seen pattern. This pattern is incompatible with the idea that improving other people’s ideas merely causes the source of the idea to become less available. Instead, it indicates that improvement specifically increases the likelihood that people will believe the original idea was their own, as previously argued by Stark and Perfect (Perfect & Stark, 2008b; Stark & Perfect, 2006, 2007, 2008; Stark et al., 2005).

| Table 2 | The Rate of Self- and Partner Plagiarism Errors on the Generate-New Task as a Function of Partner Expertise and Idea Elaboration |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Idea origin | Control | | | Improved | | | |
| | Novice | Expert | Novice | Expert | Novice | Expert | Novice | Expert |
| Self | 13.6% | 4.8% | 20.8% | 5.6% | 28.8% | 6.4% | 12.0% | 4.0% |
| Partner | 18.4% | 5.6% | 54.4% | 8.8% | 16.8% | 4.8% | 30.4% | 6.4% |

Figure 2. The effects of improvement on correct recall and rates of wrong-source intrusions in the recall-own and recall-partner tasks. Error bars represent standard errors.

Figure 3. The effects of expertise on rates of plagiarism errors on the generate-new task. Error bars represent standard errors.
In line with the data of Perfect and Stark (2008b), there was no evidence for a general bias toward positive ideas in the recall task. For the control items, participants were no more likely to correctly recall the expert ideas than they were the novice ideas in either the recall-own or the recall-partner tasks. However, this was not because their partner’s expertise had no impact on behavior, as is evident in the generate-new data. Their partner’s expertise clearly influenced plagiarism rates when participants tried to generate a novel idea. As with the recall data, this effect was very specific. In generating new ideas, participants accidentally generated old ideas from their partners and from themselves. When plagiarizing their own ideas, they did not distinguish between topics. However, when plagiarizing their partner, they were more than twice as likely to plagiarize their partner’s expert topic as they were their novice topic (see Figure 3). For the control items, participants were almost three times more likely to reproduce an expert idea than a novice idea (see Table 2). This was not because those ideas were more objectively plausible but because the ideas themselves were identical, whether presented as coming from a novice or an expert.

Is it possible that somehow participants spontaneously elaborated the ideas from experts in this study and that this caused the increase in generate-new plagiarism, as argued by Bink et al. (1999)? We believe not for two reasons. First, at generation, participants were fully engaged in the task of generating ideas for themselves, unlike in the study by Bink et al. (1999) in which participants were passive recipients of information presented to them. Given the difficulty of the task, there is no reason to believe that participants would engage in spontaneous elaboration of their partner’s ideas differentially on the basis of expertise, although we concede that it is possible. However, more compelling is the fact that this study included an explicit manipulation of elaboration that failed to find an elevating effect on unconscious plagiarism on the generate-new task. Given that neither imagery (in previous studies) nor improvement (in previous studies and this one) fail to increase plagiarism in the generate-new task, it is hard to see how spontaneous elaboration is likely to be the cause of the expertise effect on generate-new plagiarism here.

One potential criticism of the present study is that the effects we attributed to idea improvement could be equally due to mere repetition of the idea rather than the process of improving it. Ideas that were improved were not necessarily re-presented to participants, whereas control ideas were not. Although this is undeniable, we are confident that the effects are caused by improvement because previous studies exploring the effects of improvement have used a re-presentation control as well as the nonpresented control condition used here (Stark et al., 2005; Stark & Perfect, 2007), and no differences in plagiarism rates between these two control conditions were reported. In contrast, all of these studies showed robust effects of improvement. It is worth noting in passing that the present study replicated the improvement effect even though the initial generation task (health and environmental questions) differed from that reported previously (the Alternate Uses Test; Christensen, Guilford, Merrifield, & Wilson, 1960) and despite reducing the number of improvements sought from 3 to 1. Additionally, the study replicated the valence-based effect on generate-new performance reported by Perfect and Stark (2008b), despite changing the materials and the method used to induce the perceived valence of the ideas. Thus, both effects appear to generalize well across methodological changes, suggesting that the mechanisms involved may influence real-world plagiarism.

In summary, the present study has shown a double dissociation between plagiarism errors on a recall-own task and plagiarism errors on a generate-new task. Recall-own plagiarism is driven by source-monitoring judgments based on processes shared by generating an idea and improving it. This effect is not due to a generalized lowering of source-monitoring accuracy, because it is not evident on a recall-partner task. In contrast, generate-new plagiarism errors are related to the perceived quality of previously experienced ideas rather than simply the strength of an idea: Participants are more likely to reproduce an idea from a perceived expert than from a perceived novice, even though those ideas are identical.

Knowing about these effects might not help prevent the occurrence of disputes about idea ownership (people are unlikely to stop thinking about other people’s ideas or to seek out discussion with novices in preference to experts), but it might help people respond differently when a dispute does occur. If you suspect someone of plagiarizing your idea, then rather than thinking of them as malicious, you might consider it an act of flattery: They have either thought about your ideas or judged you to be an expert.

References


Appendix

Questions Used to Cue Initial Idea Generation and Responses Used by the Confederate in the Order of Their Utilization

Health Questions

What can be done to reduce childhood obesity?

Initial answers
1. Have healthier school dinners
2. Have walking bus schemes
3. More free sporting facilities
4. Have healthy role models speak to kids

Reserve answers
5. Punish parents
6. More compulsory physical education lessons
7. Educate children about nutrition
8. Have fat camps like America

What can be done to reduce fast-food consumption?

Initial answers
1. Limit number of outlets in one place
2. Stop parents using fast food as a treat
3. Raise minimum food standards
4. Higher fast food tax

Reserve answers
5. More healthy options available
6. Ban advertising
7. Free cooking lessons for families
8. Show people what is in fast food

What can be done to reduce binge drinking?

Initial answers
1. Restrict bar opening hours
2. Limit the amount a group can drink in a night
3. Ban special offers
4. Make people hospitalized by alcohol pay for their treatment

Reserve answers
5. Increase alcohol tax
6. Offer free water
7. Compulsory education for drinkers
8. Increase minimum drinking age

Environmental Questions

What can be done to stop global warming?

Initial answers
1. Improve public transport
2. Develop cleaner fuels
3. Tax on high pollutants
4. Greener politicians

Reserve answers
5. Educate people
6. Restrict nonessential air travel
7. Stop destroying rainforests
8. Encourage car-share schemes

What can be done to make the university more “green”?

Initial answers
1. Put solar panels on top of buildings
2. Stop people giving out leaflets on campus
3. Set up a park-and-ride scheme
4. Ban car parks altogether

Reserve answers
5. Ban smoking on site
6. Ensure all printing is double-sided
7. Have a better bike system
8. Switch off lights when not in use

(Appendix continues)
What can be done to encourage recycling?

<table>
<thead>
<tr>
<th>Initial answers</th>
<th>Reserve answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. More frequent home collections</td>
<td>5. Advertise importance</td>
</tr>
<tr>
<td>2. Make it easier for people</td>
<td>6. Educate people from a young age</td>
</tr>
<tr>
<td>3. Limit amount of nonrecyclable waste that can be thrown away</td>
<td>7. Incentives for recycling</td>
</tr>
</tbody>
</table>

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