

1 **Too perfect to be good? An investigation of**
2 **magicians' Too Perfect Theory.**

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Abstract

The “Too Perfect Theory” states that if a trick is too perfect, it might paradoxically become less impressive, or give away its secret method. This theory suggests that an increased impossibility results in a less magical effect. The Too Perfect Theory is often applied to magic effects, but it conflicts with recent scientific investigations showing that participants’ level of enjoyment of a magic performance is positively related to their perceived impossibility of the trick (Kuhn & Bagienski, submitted). The current paper investigated whether an imperfect magic performance is more impressive than a perfect one. Across two experiments, we studied whether participants enjoy a performance more if the effect is not perfect. We also examined the different types of explanations people give to these two types of performances. The results showed that participants enjoyed a perfect performance more than an imperfect one. However, consistently with the Too Perfect Theory, participants watching the perfect performance also discovered the correct method behind the magic trick more frequently and believed the performance was staged more often. Moreover, participants’ method explanation significantly impacted their reports about the performance.

Introduction

We usually find things to be perfect when they are devoid of flaws, and this principle applies to many artistic performances. We do not enjoy seeing a juggler dropping their balls, an actor forgetting their lines or a musician playing the wrong chords. However, in the world of magic, perfection itself can be a flaw, and this has led to the suggestion that some magic tricks are too impossible. Most people who choose to watch a magic show know that magic is not real. Even though the experience itself feels real, on a rational level, spectators know that magic tricks are

56 not achieved by supernatural means (Leddington, 2016). Indeed, it is this conflict in beliefs that
57 is central to the art of magic (Kuhn, 2019; Lamont, 2013). Because of this, spectators often leave
58 a magic show with some rational idea of the means by which the thing they have witnessed was
59 achieved. In many instances they may come up with a wrong, yet plausible solution. For
60 example, imagine a magic trick in which the magician claims to be using mind reading powers to
61 deduce the name of a freely chosen playing card. There are lots of different potential
62 explanations for this effect, and people might think that a magician used a tricked deck to control
63 the spectator's card and correctly guess its identity, even when this is not the case. In ~~the~~ *The*
64 *Magic Way*, Tamariz highlights the importance of eliminating such plausible, yet wrong
65 solutions, as they inadvertently reduce the cognitive conflict that magic elicits and as such reduce
66 the magical experience itself (Tamariz, 1988). Some tricks are simply too perfect and they end
67 up permitting a unique possible method, the correct solution. Therefore, it appears that magicians
68 should probably eliminate, for the audience, the most plausible method to make it harder for
69 them to guess the actual method – thus making the performance more 'magical'. Introducing
70 imperfections in a performance might bring uncertainty in the spectators' mind, leading them
71 away from the secret method. For instance, getting the colour and number of the spectator's card
72 right, but with the wrong suit (e.g., three of hearts instead of three of diamonds) might rule out
73 the possibility that the magician used a forcing technique to control the spectator's card choice
74 (Pailhès et al., 2020; Pailhès & Kuhn, 2021).

75 Rick Johnsson proposed the Too Perfect Theory (Johnsson, 1970) which states that, if a trick is
76 too perfect, it might paradoxically become less impressive, or give away its secret method and
77 ruin the performance. Johnsson proposed two premises to explain the theory: (1) in the twentieth
78 century people no longer attribute the magician with supernatural powers, and (2) to a rational

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79 person, the unknown is unacceptable. Johnsson argues that rapid scientific and technological
80 advances combined with the frequent public exposure of magic secrets has resulted in modern
81 audiences giving more credit to the magician's skills rather than their supernatural 'powers'.
82 Johnsson further suggests that, since the beginning of time, humans have been searching for
83 causal explanations behind the mysteries that surrounds them. These two premises explain why
84 spectators feel the need to explain how the trick is done (see Jay, 2016). However, magic relies on
85 people not knowing the true cause of the effect (Kelley, 1980), and a good performance should
86 prevent the audience from correctly deducing, or even guessing, the secret method (Tamariz,
87 1988). Thus, according to the Too Perfect Theory, if a trick is so perfect that it no longer leaves
88 room for any explanation than the correct one, it becomes less enjoyable. In other words, the
89 theory suggests that an increased perceived perfection results in a less magical effect. As some
90 authors point out (Carney, 2001; Twose, 2020), in magic, perfection might make a solution
91 obvious, thereby undercutting the perceived impossibility of the performance. For instance, a
92 trick seen on television that appears 'too perfect – such as a magician correctly guessing all five
93 words that a spectator is thinking of – might be explained in terms of camera tricks, or stooging.
94 However, if the performer introduces an error and misses one of the words, the performance
95 might be more likely to be interpreted as 'true' mind reading skills, leaving the audience
96 therefore being more impressed as well.

97 The "Too Perfect Theory" is often applied to mentalism effects, but the theory conflicts with
98 recent scientific investigations into people's enjoyment of magic. Bagieniski and Kuhn,
99 (submitted) used a trick in which the magician balanced different objects by stacking them on
100 top of each other and making the trick increasingly impossible, and participants were asked to
101 rate the level of impossibility and their enjoyment at each stage of the effect. Results showed

102 that participants' level of enjoyment of the performance was positively related to their perceived
103 impossibility of the trick (i.e., as the performance became more and more impossible). We have
104 recently also shown that people's enjoyment of a trick is positively correlated with their
105 perceived level of impossibility (Kuhn, Pailhès, Jay & Lukian, submitted). However, crucially in
106 this study, participants watched different versions of a trick in which the magician predicted the
107 number named by a spectator. Participants enjoyed a performance just as much when the
108 volunteer chose a number between 1 – 4, compared to when the choice was not restricted. This
109 latter effect represents a magic trick that is pretty much perfect, and yet, it was not enjoyed less
110 than the less perfect one.

111 The Too Perfect theory has been heavily debated in the magic literature. For instance, well-
112 respected magician Tommy Wonder called this theory "one of the worst concepts to appear in
113 magic in a very long time" (Wonder, 1996, p.2), stating that it is not only wrong but also highly
114 detrimental to the art. Darwin Ortiz also discusses the Too Perfect Theory stating that he does
115 not entirely agree with it, and states that every time he brings it up during a conversation, it is
116 attacked (Ortiz, 2006). Likewise, Tom Stone (Jay, 2021) explains that the theory is incomplete
117 as it does not make firm predictions about the success of an effect. As such the Too Perfect
118 Theory does not make explicit which tricks would benefit from being flawed.

119 Moreover, magician Dominic Twose (Twose, 2020) proposes that the Too-Perfect theory is
120 misnamed and should be called the Too Obvious theory. Accordingly, if the spectator guesses
121 the correct method of a trick, it is because the method is the obvious one, rather than too perfect.
122 Likewise, John Carney encourages us to think of this principle as the 'What-Else? Theory' or the
123 'One Solution theory' (Carney, 2001), as the problem lies in providing alternate solutions than

124 the secret one to the spectators. Rather than findings ways to make a trick less ‘perfect’, the
125 solution would be to offer a plausible alternative explanation to the trick.

126 The Too-Perfect Theory also relates to another magic theory, known as the theory of False
127 Solution (Kuhn et al., 2014; Lamont & Wiseman, 2005; Tamariz, 1988). Recent research
128 (Thomas et al., 2018) shows that exposure to an obvious false solution (e.g. a performer hiding a
129 card in the palm of his hand to secretly transfer it to his pocket) prevents participants from
130 finding the real method (e.g. the magician used a duplicate card), even when the magician proves
131 that this false solution is impossible (e.g. showing that their hand is empty). The authors explain
132 this effect with the *peripheral representation hypothesis*, whereby a false solution activates a
133 peripheral representation of the problem, which remains active even after the erroneous solution
134 has been ruled out. If the magician entices the spectator to come up with an erroneous
135 explanation, the peripheral part of the false representation inhibits the discovery of the correct
136 solution, even if this solution is ruled out later on (Thomas & Didierjean, 2016).

137 Over the years, the Too Perfect Theory has been debated, discussed, embraced and attacked
138 (Racherbaumer, 2001). However, to our knowledge, no scientific investigations has tested it.
139 Still, many magicians seem to believe that introducing imperfection into their tricks can make
140 those tricks better, as their method would thereby become less obvious. The current paper aims
141 to study one application of this idea that is especially common in mentalism – that introducing
142 imperfection in the sense of making a trick less reliable might increase participants’ enjoyment
143 and perceived impossibility of this trick. In our first experiment, we investigate whether
144 participants enjoy a performance more when the magician’s mind-reading is slightly off target
145 than when it is perfect. Our second experiment follows Carney’s (2001) suggestion and further
146 examined the different types of explanation people give to these two types of performances.

147

148 **Experiment 1**

149 The aim of the first experiment was to evaluate whether a perfect performance was less
150 impressive and enjoyed than an imperfect one. We sought to investigate whether a performance
151 in which the magician succeeded in all his effects (i.e., correctly guessing the colour, suit and
152 number of a freely chosen card) produces lesser appreciation of the trick than one in which the
153 magician provides an imperfect effect (i.e., correctly guessing the colour and suit but not the
154 number of the card). Based on the Too Perfect Theory, we predicted that participants would find
155 the performance more impressive and enjoyable when it was imperfect.

156 **Methods**

157 *Participants*

158 123 participants (40 female) between 18 and 56 years old ($M=24$, $SD=7.17$), who were all
159 recruited on Prolific, took part in the experiment. Goldsmiths Psychology Department provided
160 ethical approval for all experiments. For all experiments, participants provided written informed
161 consent before participating. We confirm that for the two experiments we reported all measures,
162 conditions, data exclusions and how we determined our sample sizes.

163 The sample size was calculated thanks to a power analysis for a t-test for independent
164 means, with $d=.5$ (medium effect size), $\alpha=.05$, and a power of .80. We based our effect size
165 estimation on the magic literature and by looking for an effect we estimated worth-finding. The
166 output of the calculation was 102 participants.

167

168 *Procedure*

The survey was implemented online via Prolific. After reading the information page on which participants were told they were going to watch a short video of a magic trick and General Data Protection Regulations, participants confirmed they accepted to take part in the study and signed the consent form. Then, we displayed one of the two videos in which a magician performed the same trick with two different outcomes and randomly attributed each participant to one of two experimental conditions: Perfect performance or Imperfect performance. In all conditions, the magician asked a spectator (a confederate) to pick a card out of a deck (the 9 of Diamonds), look at it and think about it. The magician then instructed the spectator to think of the card, and he asked her to think about whether it was a red or black card. He then proceeded to correctly name the colour (red). The magician then asked the spectator to think of the suit, and again he correctly named it (Diamond). Finally, he asked the spectator to imagine the number and then either guessed that the card was a 9 of Diamonds (Perfect performance) or a 6 of Diamonds (Imperfect performance).

After watching one of these videos, participants had to state on scales from 0 (not at all) to 100 (very much) how impressed they were by the performance, how difficult they thought it was to perform, how much they enjoyed the performance, how surprised they were about the outcome of the performance. Based on the Too Perfect Theory, we expected all these measures to be significantly higher in the Imperfect rather than in the Perfect performance. We also asked participants to estimate the likelihood of the performance succeeding (from 0 to 100%) as a mean to measure perceived impossibility, and expected that participants would report higher means in the Perfect rather than Imperfect condition.

Results and discussion

192 Overall, participants were moderately impressed ($M=52.2$, $SD=27.2$) and surprised ($M=49.7$,
193 $SD=28.4$). They also felt that the performance was moderately difficult to perform ($M=55.4$,
194 $SD=26$), reported medium levels of enjoyment ($M=50.3$, $SD=28.2$) and estimated a moderate
195 likelihood of the performance succeeding ($M=56.4$ $SD=24.2$).

196
197 **Figure 1.** Mean ratings of the magic trick depending on the type of performance. Error bars display standard
198 errors. * $p<.05$, ** $<.01$

199
200 As the data were not normally distributed, we used Mann-Whitney non-parametric tests. Looking
201 at the two types of performance, participants felt significantly more impressed in the Perfect
202 performance than in the Imperfect one ($W=1264$, $p=.005$, $r_{rb} = -.298$) and enjoyed the Perfect
203 performance more than the Imperfect one ($W=1359$, $p=.021$, $r_{rb} = -.245$). This goes against our
204 predictions, suggesting that the performance in which the magician correctly guessed all the
205 features of the spectator's chosen card was more impressive and enjoyable than the imperfect
206 performance. These results support John Carney's (Carney, 2001) view that simply making the
207 trick imperfect does not increase observers' enjoyment of the performance. Instead, the Too-
208 Perfect Theory might rely more on providing an alternative explanation for the effect.
209 Looking at the other measures, participants did not report significantly different levels of
210 estimation of the performance's difficulty ($W=1785$, $p=.941$, $r_{rb} = -.008$), likelihood of
211 succeeding ($W=1509$, $p=.126$, $r_{rb} = -.161$) and did not report significantly different levels of
212 surprise ($W=1524$, $p=.148$, $r_{rb} = -.153$) according to the performance.

213
214 **Table 1.** Correlation matrix showing Spearman's correlations between each of the variables.

215

216 Next, we examined the correlations between our five measures. Table 1 shows that all our
217 variables except perceived difficulty and likelihood of success correlate positively with one
218 another. The strongest correlation was between participants' enjoyment of the performance and
219 how impressed they were by the trick. This confirms recent results about participants' estimation
220 of a trick impossibility and their appreciation of it (Bagiński & Kuhn, submitted; Kuhn et al.,
221 submitted). There was no significant correlations between participants' estimation of the trick's
222 likelihood of success and their perceived difficulty of it. If we estimate that a trick is very likely
223 to succeed, it is reasonable to also think that it is not so difficult to perform.
224 We kept this first experiment as simple as possible to exclude other possible factors than the
225 performance's 'perfection' that could impact participants' appreciation of the performance.
226 However, we believe that the current experiment missed an important factor. In the current
227 videos, the magician did not provide any explanation for his imperfection, which might just have
228 been perceived as a failure of the entire effect. Providing an explanation for the imperfection
229 might provide us the opportunity to introduce an alternative solution (e.g. the magician used
230 mind reading skills) than the secret one (i.e. here, the use of a stooge) in the participants' mind,
231 making them enjoy the performance more.

232
233 **Experiment 2**
234 The previous study does not support the Too-Perfect Theory prediction, and the results suggest
235 that people enjoy a trick more when it is devoid of imperfection. In the second experiment, we
236 aimed to address one of the main limitations by including an imperfect performance in which the
237 magician provides an explanation for the mistake that is in line with the intended magical effect.
238 We expected that the justification provides an alternate explanation for the trick that should

strengthen the effect, and reduce the chances of people guessing the real method (i.e. use of a stooge/actor).

As the Too-Perfect Theory is thought to induce alternative solutions, we examined the nature of these explanations by asking participants to explain how they thought the trick had been done. We predicted that the imperfect performances would result in a different type of explanations, and that they would reduce the chances of people suspecting the use of a confederate. We also expected participants to appreciate the performance more when the magician provided an explanation with his imperfection.

Methods

Participants

338 participants (146 female) between 18 and 65 years old ($M=24$, $SD=7.17$), who were all recruited on Prolific, took part in the experiment. The sample size was calculated thanks to a power analysis for a fixed-effects ANOVA, with $f=.18$ (small to medium effect size), $\alpha=.05$, and a power of .80. We based our estimation of the effect size on the effects of our first experiment and the output of the calculation was 301 participants.

Procedure

The same procedure as Experiment 1 was used, except that we had three experimental groups. Participants were randomly allocated to either a Perfect Performance, an Imperfect Performance or an Imperfect Performance with an Alternative Solution. The performances for the Perfect Performance as well as the Imperfect Performance were the same as in Experiment 1. However, this time, for the Alternative Solution condition, the video was the same as the Imperfect one,

except that at the end the magician justified his mistake by explaining that through mind reading he must have seen the correct number (9) the other way round in his mind, ending up with the 6 of Diamonds.

After watching one of these three videos, participants answered the same questions as in Experiment 1. This time, we also added a qualitative question asking participants to describe how they thought the performance was accomplished.

Results and discussion

Performance ratings

Overall, participants were moderately impressed ($M=40$, $SD=26.9$) and surprised ($M=41.4$, $SD=29.1$). They also felt the performance was moderately difficult to perform ($M=51.78$, $SD=31.3$), reported medium levels of enjoyment ($M=39.1$, $SD=30.9$) and estimated a moderate likelihood of the performance succeeding ($M=47.9$ $SD=29.1$).

Then, we conducted Kruskal-Wallis tests and contrast analyses to look at the effect of our types of performances. Participants reported significantly different levels of impression ($H(2) = 22.93$, $p<.001$), enjoyment ($H(2) = 17.8$, $p<.001$) and surprise about the performances ($H(2) = 7.01$, $p=.029$). The linear contrast analyses showed that participants reported the lower levels for these measures in the Imperfect Performance, higher levels in the Alternative Solution one, and the highest in the Perfect Performance (see figure 2). Contrary to our predictions, this suggests that even when the magician provided an alternative solution to justify his imperfect performance, this was still less appreciated than a perfect performance.

Likewise, participants estimated that the likelihood of the trick succeeding was significantly different in the three types of performance ($H(2) = 12.28$, $p=.002$), contrast analysis showed the

285 same pattern as with the other measures ($t(337) = 3.63, p < .001$, figure 2). However, participants
286 did not report significantly different estimations of the level of difficulty for the performances
287 ($H(2) = 1.87, p = .393$), replicating results from our first experiment. This suggests that making a
288 mistake during the performance did not affect the audience's perception of the difficulty of the
289 trick.

290
291 **Figure 2.** Mean ratings of the magic trick depending on the type of performance. Error bars display standard
292 errors. * $p < .05$, ** $p < .01$, *** $p < .001$

293
294
295 **Table 2.** Correlation matrix showing Spearman's correlations between each of the variables.

296
297 Next, we looked at the correlations between our five variables. Table 2 shows that all variables
298 significantly correlated with each other, replicating results from Experiment 1. However,
299 contrary to Experiment 1, this time the perceived difficulty of the trick also correlated with
300 participants' estimations of the likelihood of success for the trick. This correlation disappeared
301 ($r_s = .127, p = .058$) when we focus on the Perfect and Imperfect performances – the ones used in
302 our first experiment. This suggests that participants associated the trick's difficulty with its
303 likelihood of success only when they watched a performance that provides an alternative
304 solution.

305
306 **Method explanation**

307 We next examined the type of explanations that participants provided for how they thought the
308 trick had been done. We expected that participants would be more suspicious of the Perfect

309 performance than the two others. After analysing participants' explanations, we came up with
310 five main categories to classify each of their statements. We excluded 45 participants from the
311 analyses as they did not provide any explanations to the trick but simply described what they saw
312 in the video or things such as it was 'very impressive', 'I'm surprised', etc. Participants' reports
313 were coded by two independent blind coders, who initially agreed on 88% of the reports. The
314 remaining reports were categorized by the subsequent coders' agreement.

315

316 The five categories of method explanations were:

317 **Correct method:** Participants thought the performance was staged or arranged in some way
318 with the help of a confederate, cooperation or video editing (i.e. guessing the correct solution).

319 **No idea:** Participants reported not knowing how the trick was done.

320 **Trick:** Participants mentioned mechanisms involving the magician controlling the spectator's
321 card choice (forcing technique, tricked or marked deck) or having a physical way to know which
322 card the spectator chose (counting the cards, marked deck, using a mirror).

323 **Psychological/pseudoscientific explanation:** Participants mentioned explanations including
324 mind-reading, reading subtle micro-expressions and body language.

325 **Luck:** Explanations that were based on luck or guessing.

326

327

328 **Figure 3.** Percentages of participants' depending on the type of performance and type of method explanation.

329

330 Overall, participants most frequently came up with psychological/pseudoscientific explanations
331 (34.7%) followed by explanations based on trickery (24.9%), followed by not knowing the

method behind the trick (20%), followed by methods based on luck (11.3%) and finally those who correctly guessed it was staged (9.1%).

A Chi-Square test found a significant difference in participants' explanations across the three types of performance ($X^2(8, N=265) = 26.5, p < .001, V = .223$). Post hoc analyses looking at adjusted residuals showed that more participants than expected provided explanations based on Luck in the Imperfect performance than in the other conditions, and the reverse was true with regards to explanations that guessed the correct method. This confirms our prediction, suggesting that a perfect performance, although more enjoyable, makes spectators more suspicious about the method used and – they are more likely to suspect it was staged. As suggested by the Too-Perfect Theory, a perfect trick resulted in more participants guessing the correct secret method (i.e., use of stooge, 'fake' performance) than in the imperfect ones. Moreover, results concerning the Lucky guess suggest that performing an imperfect trick without providing any explanation, led participants to conclude that no "real" method was used and that instead the magician was simply guessing.

Explanations' impact on performance ratings

Finally, we looked at how participants' ratings varied as a function of the explanation they gave. Kruskal-Wallis tests showed that participants' explanations had a significant impact on how impressed they were by the demonstration ($H(4) = 12.3, p = .015$), how difficult they thought the trick was to perform ($H(4) = 15.3, p = .004$), how much they enjoyed the performance ($H(4) = 17.1, p = .002$), their estimation of the likelihood of the performance's success ($H(4) = 38.1, p < .001$) and their level of surprise ($H(4) = 24.8, p < .001$).

354 We then proceeded to deviation contrast analyses to inspect the impact of participants'
355 explanation in more details (see figure 4).

356

357 *Correct method*

358 The analyses showed that participants who thought the performance was staged – and therefore
359 correctly guessed the secret method – found the performance to be significantly less difficult to
360 perform ($t(270) = -3.26, p=.001$) and estimated the likelihood of the performance succeeding
361 significantly lower ($t(270) = -3.49, p<.001$). Indeed, using a stooge or video editing might
362 appear as easier to perform than complex sleight of hands or psychological skills. Likewise,
363 participants were significantly less surprised by the demonstration when they thought it was
364 staged ($t(270) = -2.79, p=.006$).

365 *No idea*

366 Participants who reported not knowing how the performance was accomplished estimated the
367 performance as significantly more difficult than the other participants ($t(259) = 2.08, p=.038$).
368 Likewise, these participants also reported higher levels of surprise than the other groups ($t(260)$
369 $= 2.13, p=.034$). This is congruent with the Too-Perfect Theory, suggesting that people who
370 claim not knowing how the trick was performed seem to appreciate it more.

371 *Trick*

372 Participants who gave explanations linked to trickery, or physical means, estimated the
373 likelihood of the performance succeeding as significantly higher than the other groups ($t(260) =$
374 $5.18, p<.001$). This makes sense in that participants in this group often provided method
375 explanation that were based on a range of reliable ways of performing the trick (e.g. using a

mirror or a marked deck to see which card the spectator choose, or forcing the spectator's choice).

Psychological/pseudoscientific explanations

As displayed in Figure 4, contrast analyses showed that participants felt significantly more impressed ($t(259) = 3.04, p=.003$), found the trick more difficult ($t(259) = 2.32, p=.021$), enjoyed it more ($t(259) = 3.65, p<.001$) and were more surprised ($t(260) = 4.05, p<.001$) when they gave psychological and pseudoscientific explanations. This confirms our prediction, suggesting that when spectators can come up with an alternative method – or even ~~to~~ one which would in principle be usable – they appreciate the performance more. Participants giving pseudoscientific method explanations also estimated the likelihood of the trick succeeding significantly higher than the other participants ($t(260) = 3.80, p<.001$).

Lucky guess

Finally, participants who thought the performance was accomplished through lucky guess estimated the likelihood of the trick succeeding as significantly lower ($t(260) = -3.41, p<.001$) than the other participants.

Figure 4. *Distribution of participants' reports about the performance by type of method explanation.*

Overall, the results from this second experiment suggest that people appreciate a perfect performance more than a performance with an imperfection, even when the magician provides an explanation that justifies the mistake. These results are contrary to what we could expect from the Too-Perfect Theory. However, the different performances did lead to different types of method explanation. Participants were more likely to guess the correct method (i.e. staged performance using a stooge) when they watched the perfect performance. Participants who

400 watched an imperfect performance without any alternative explanation were more likely to think
401 that the performance was not based on any ‘real method’ (i.e. the magician relying on luck or
402 simply trying to guess the card). Finally, participants who gave pseudoscientific explanation
403 were the ones who enjoyed the performance the most.

404

405 **General discussion**

406 Johnsson’s Too-Perfect-Theory states that “Some tricks, by virtue of their perfection, become
407 imperfect. Conversely, some tricks, by virtue of their imperfections, become perfect”. (p.50
408 (Racherbaumer, 2001)). In this paper, we sought to investigate these tenets, and examined
409 whether participants appreciate a magic performance more when it contained an ‘imperfection’.

410 Contrary to what we would expect from the theory, participants preferred a perfect
411 performance to an imperfect one. In experiment 1 we found that participants preferred a perfect
412 performance in which the magician correctly discovered the card’s colour, suit and number to an
413 imperfect one in which the magician correctly deduced everything except the card’s number – a
414 6 instead of a 9. Participants rated the perfect performance as more enjoyable and impressive
415 than the imperfect performance. In experiment 2 we added a further condition in which the
416 magician provided a plausible explanation for the imperfection. This explanation was intended to
417 strengthen the plausibility of the magician reading the spectator’s mind and thus strengthen the
418 effect. Rather than simply misnaming the number, the magician explained that he named the
419 number 6 rather than the 9 because he unintentionally misrepresented the mental image.
420 Magicians often provide these types of explanation, and we anticipated that it should strengthen
421 the effect. However, our results show that participants still preferred a perfect performance.

422 In experiment 2 we also examined the type of explanations participants provided for how they
423 thought the trick had been achieved. Our results show that even though an imperfect trick will
424 not necessarily improve how much people enjoy it, the imperfection does change the types of
425 explanations that observers provide. A higher proportion of participants guessed the correct
426 method in a perfect performance than in the imperfect versions – they thought the performance
427 was staged. Adding an imperfection to the trick also increased the proportion of viewers who
428 explained the performance in terms of psychological/pseudoscientific principles. As mentalists
429 often frame their effects around such principles (e.g., using body language or mind reading
430 skills), this is the type of explanation that a performer intends their spectators to endorse. Such
431 type of explanations are often widely removed from actual methods that can be used to perform
432 this kind of trick. Indeed, our subsequent analysis shows that observers who attributed the effect
433 to psychological/pseudoscientific principles appreciated the performance more than the others.
434 This is consistent with the Too Perfect Theory in that it allows people to come up with an
435 alternative method to the correct one, which can potentially result in higher levels of
436 appreciation. However, it is important to note that the quasi-experimental nature of our design
437 prevents us from making any causal attributions, and so we cannot be sure about the direction of
438 this relationship.

439 Humans perceive the world in terms of causal relationships which means they always
440 need explanations to things that bewilder them (Kuhn, 2019). After observing a magic trick,
441 people often feel compelled to come up with some explanation of how the trick has been
442 achieved, even when the explanation is wrong or implausible (see choice blindness, (Johansson
443 et al., 2005). Past research shows that the nature of these explanations can vary depending on
444 situational factors, as well as individual differences. For example, Gronchi and Zemla (2021)

demonstrated that when watching a mentalism magic trick, analytical thinkers tend to generate explanation that are more rational (e.g. explanations based on physical props), whilst intuitive thinkers are more likely to generate irrational explanations that accord with the magician's backstory (e.g. subliminal cues). Likewise, people's prior beliefs also influence the type of explanations that people provide for such magical effects (Lesaffre et al., 2018; Mohr et al., 2014). The nature of such explanations will affect how people experience the magic. If people are led to believe that the performance was staged – as in the present paper – observers will be less likely to endorse the intended pseudo-explanation and the magical experience can be reduced. However, our results could also mean that people enjoy a performance more if they believe the magician used pseudoscientific skills to his ends. It is likely that these types of principles elicit more fascination than 'simple' sleight-of-hand skills, or methods that rely on physical deception (e.g. marked deck).

Magicians often state that the Too-Perfect Theory does not necessarily refer to situations in which the magic is too good or too strong, but instead refers to obviously impossible circumstances, especially in conjunction with weak presentation. John Carney for instance suggests that magicians should make a solution less obvious rather than make the trick less perfect (Carney, 2001). Accordingly, the theory could be thought of as the 'One Solution Theory' or the 'What-Else? Theory', with many ways to make this theory work. One alternative could for instance be to use magician Juan Tamariz's False Solution approach (Tamariz, 1988). For instance, a magician could pretend to palm a card (i.e., hide it under their hand) when in reality they use duplicates of this card to make it appear at different impossible location. Here, mimicking the palming gesture and making the trick 'less perfect' in that it could appear as the

secret method is revealed because of the magician's clumsiness results in leading the spectator down the path of a possible solution, which the magician can later make clear is false. The Theory of False Solution seems related to fixation and anchoring effects. Once a possible solution is introduced, it becomes more difficult for the observer to generate an alternative and all generated alternatives will be anchored on the original false solution.

Some magicians claim that enticing observers to endorse psychological explanations of an effect prevents observers from searching for alternatives and that this can result in more enjoyable performances. Mentalism is one of the most popular magic genres (Jay, 2016), and mentalists often frame their performances as psychological demonstrations. Our results demonstrate that participants who endorsed a psychological explanation enjoyed the performance more, and that the imperfection nudged observers towards offering such explanations. Our results also show that a large proportion of our observers felt compelled to endorse a potentially valid method (e.g., marked deck, mirror, counting cards...), but that this reduced their enjoyment of the effect.

Twose (2020) proposes that the Too Perfect Theory should be rather thought of as the 'Too Obvious Theory', and that a magician should offer a plausible alternative explanation to the trick rather than making their trick less 'perfect'. However, our results, contrary to what we could expect based on this approach, showed that participants' enjoyment of the trick decreased as the method for performing the trick became less obvious. Future research could put the entire focus on the alternate solution rather than the imperfections of the trick. One could use 'perfect' performances similar to what we used here, but either provide an alternative explanation or not. For instance, we could present our mindreading effect, with a magician asking ~~to~~ the participant to freely take a card out of a deck and either having the performer acting as if they are trying to

491 read the participant's microexpressions or directly guessing the correct answer – We predict that
492 participants would be less likely to suspect the use of a one-way deck (all cards are identical)
493 when the magician provides an alternative explanation.

494 Our studies have two main limitations. Firstly, our results are limited in that we used one specific
495 type of magic trick and the results might not be generalizable to all types of tricks and
496 performers. There are lots of different styles of magical effects, as well as ways in which the
497 same effect can be performed. Magician Tom Stone (Jay, 2021) underlines the fact that the
498 theory is limited to *some tricks*, without defining how those tricks can be recognized.

499 Accordingly, a magician would have to perform a trick first and then judge by the spectators'
500 reactions whether the trick belongs in the 'some tricks' category of the Too Perfect Theory. We
501 focused on a mentalism effect, because this is an area where the Too Perfect Theory is more
502 frequently applied. It is worth-noting that there is some disagreement in the magic community
503 about whether mentalism should be categorized as magic. Although a common assumption is
504 that mentalism is a subset of magic, some magicians and mentalists would disagree with it. It is
505 possible that the Too Perfect Theory will have an impact on other types of tricks than on a
506 mental effect such as the one investigated in this study. However, we feel that the performance,
507 represents a fairly typical context in which the principle would be applied, and thus our results
508 do generalize to a broad range of effect.

509 On a related note, we investigated one type of imperfection and there are lots of other ways in
510 which such imperfections can be introduced (e.g. missing one word out of several to guess or not
511 finding the spectator's chosen card in the first place). Further research may focus on some of
512 these other forms of imperfections. It is also possible that our participants simply perceived the
513 imperfection as a failure rather than a slight imperfection. It might therefore be necessary to

implement less important imperfections, such as the magician getting the suit slightly wrong rather than the number (e.g. Queen of Hearts instead of Queen of Diamonds). Likewise, we believe that an ‘imperfect’ performance could become more entertaining if the performer explained their error further than what we have done in this study. For instance, the magician could explain that they mistakenly said 6 instead of 9 because when reading the person’s mind they viewed the number upside down, and that mind-reading is a complex task that might take time to know how a person visualize things. However, in its crudest form our results demonstrate that simply adding imperfections to a trick by missing part of a prediction does not automatically improve people’s enjoyment of the trick. To the contrary, people seemed to enjoy these performances less, and they are less impressed.

This paper suggests that a magic performance containing an imperfection is less appreciated than a perfect performance. However, aligning with the Too-Perfect Theory from magic literature, people also seem more likely to find the correct – secret – method behind the trick when the performance is perfect than when it is not.

References

- Baginski, S., & Kuhn, G. (submitted). A balanced view of impossible aesthetics: An empirical investigation of how impossibility relates to our enjoyment of magic tricks.
- Carney, J. (2001). The Flaw in the Diamond. *Genii Magazine*, 59–61.
- Gronchi, G., & Zemla, J. C. (2021). Cognitive style predicts how people explain mental magic tricks. *Acta Psychologica*, 218(103347).

537 Jay, J. (2016). What do audiences really think. *MAGIC, September*, 46–55.

538 Jay, J. (2021). *Magic in Mind* (J. Jay, Ed.). VanishingInc.

539 Johansson, P., Hall, L., Sikström, S., & Olsson, A. (2005). Neuroscience: Failure to
540 detect mismatches between intention and outcome in a simple decision task. *Science*.
541 <https://doi.org/10.1126/science.1111709>

542 Johnsson, R. (1970). The Hierophant. 5-6.

543 Kelley, H. (1980). Magic tricks: The management of causal attributions. In Ballinger
544 (Ed.), *Perspectives in Attribution Research and Theory: The Bielefeld Symposium*. (Gurlitz, pp.
545 19–35).

546 Kuhn, G. (2019). *Experiencing the impossible: The science of magic*. MIT Press.

547 Kuhn, G., Caffaratti, H. A., Tetzka, R., & Rensink, R. A. (2014). A psychologically-
548 based taxonomy of misdirection. *Frontiers in Psychology*, 5(DEC), 1–14.
549 <https://doi.org/10.3389/fpsyg.2014.01392>

550 Lamont, P. (2013). Extraordinary Beliefs. In *Extraordinary Beliefs*. University Press.
551 <https://doi.org/10.1017/cbo9781139094320>

552 Lamont, P., & Wiseman, R. (2005). *Magic in theory: An introduction to the theoretical*
553 *and psychological elements of conjuring*. University of Hertfordshire Press.

554 Leddington, J. (2016). The Experience of Magic. *Journal of Aesthetics and Art Criticism*,
555 74(3), 253–264. <https://doi.org/10.1111/jaac.12290>

556 Lesaffre, L., Kuhn, G., Abu-Akel, A., Rochat, D., & Mohr, C. (2018). Magic
557 performances - when explained in psychic terms by university students. In *Frontiers in*
558 *Psychology*. <https://doi.org/10.3389/fpsyg.2018.02129>

559 Mohr, C., Koutrakis, N., & Kuhn, G. (2014). Priming psychic and conjuring abilities of a
 560 magic demonstration influences event interpretation and random number generation biases.
 561 *Frontiers in Psychology*. <https://doi.org/10.3389/fpsyg.2014.01542>
 562 Ortiz, D. (2006). *Designing Miracles*. A-1 MagicalMedia.
 563 Pailhès, A., & Kuhn, G. (2021). Mind Control Tricks: Magicians' Forcing and Free Will.
 564 *Trends in Cognitive Sciences*. <https://doi.org/10.1016/j.tics.2021.02.001>
 565 Pailhès, A., Rensink, R. A., & Kuhn, G. (2020). A psychologically based taxonomy of
 566 magicians' forcing techniques. *Consciousness and Cognition*, 86(103038).
 567 <https://doi.org/10.1016/j.concog.2020.103038>
 568 Racherbaumer, J. (2001). The Too-Perfect Theory: Thirty Years Later. *Genii Magazine*,
 569 48–70.
 570 Tamariz, J. (1988). *The magic way*. Editorial Frankson Magic Books.
 571 Thomas, C., & Didierjean, A. (2016). Magicians fix your mind: How unlikely solutions
 572 block obvious ones. *Cognition*, 154, 169–173. <https://doi.org/10.1016/j.cognition.2016.06.002>
 573 Thomas, C., Didierjean, A., & Kuhn, G. (2018). It is magic! How impossible solutions
 574 prevent the discovery of obvious ones? *Quarterly Journal of Experimental Psychology*.
 575 <https://doi.org/10.1177/1747021817743439>
 576 Twose, D. (2020). *The Too-Obvious Theory*.
 577 <https://www.vanishingincmagic.com/blog/twose-company-the-too-obvious-theory>
 578 Wonder, T. (1996). *The Books of Wonder* (Vol. 2). Hermetic press.
 579