

Impossible Intentions*

Wesley Buckwalter, David Rose, and John Turri

wesleybuckwalter@gmail.com

rose0david@gmail.com

john.turri@gmail.com

Abstract: Philosophers are divided on whether it is possible to intend believed-impossible outcomes. Several thought experiments in the action theory literature suggest that this is conceptually possible, though they have not been tested in ordinary social cognition. We conducted three experiments to determine whether, on the ordinary view, it is conceptually possible to intend believed-impossible outcomes. Our findings indicate that participants firmly countenance the possibility of intending believed-impossible outcomes, suggesting that it is conceptually possible to intend to do something that one believes is impossible.

Keywords: intention; control; impossibility; voluntarism; decision; rationality

In some cases one can be as certain as possible that one will do something, and yet intend not to do it...A person could be as certain as possible that they will break down under torture, and yet determined not to break down. – G. E. M. Anscombe

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1. Introduction

How much control do we have over our own intentions? A great deal of control, it seems. In fact, it often seems like we can intend almost anything. For example, we can intend to do or say things when we wish to, and in any number of ways, even when doing so is incredibly difficult, elaborate, or time-consuming. The things we intend might even be so difficult, in fact, that we later realize that they were impossible for us to do, at the time. This raises an interesting question about the limits of our control. Is our control so great that it is possible to form an intention to do something, even if you currently believe that doing that thing is impossible?

Philosophers are divided. For instance, it is commonly regarded as an “old dogma” that belief constrains intention, though precise details vary between accounts. Some philosophers have argued that intention requires certain beliefs, such that the action in question is probable (Audi 1973). Others have considered weaker constraints. For example, some propose that intention requires only *not believing* certain things, for example, not believing that the action will probably not occur (Mele 1989). Other philosophers have provided thought experiments suggesting that it is possible and perhaps even natural or rational to intend to do what one believes is impossible (Anscombe 1957; Ludwig 1992; McCann 1991; Thalberg 1962). One example involves a soldier who attempts to resist torture by enemy soldiers despite the belief it is impossible to do so (Anscombe 1957: 94). Another case involves someone who attempts to start a car with a dead battery to pacify an angry neighbor being blocked in (Ludwig 1992: 262). Another involves a lifeguard who attempts to resuscitate a swimmer they strongly and incorrectly believed has drown (Thalberg 1962: 54). These philosophers each suggest that the agent intended to resist the

torture, start the car, or resuscitate the swimmer, despite believing that these things were impossible. And intuitions about such cases play a decisive role in this theoretical literature. For if they are correct, philosophers have argued, then “a constraint on any acceptable theory of intention is that it explain how it is possible for an agent to have an intention to do something when he believes that it is impossible for him to do it” (Ludwig 1992: 278).

So is it conceptually possible to form an intention to do something that you believe is impossible? Given that philosophers are divided, it is reasonable to also turn to the tools of experimental cognitive science to evaluate whether it is conceptually possible. This approach is inspired in part by Al Mele, who writes that one can test philosophical analyses of intentional action by whether they are “in line with what the majority of nonspecialists would say about these actions” and where “any adequate answer...will be anchored by common-sense judgments about particular hypothetical or actual actions” (Mele 2001, p. 27).

Some research suggests that the concept of intention is viewed as controllable to some extent, though whether it includes the ability to intend what you believe to be impossible (i.e. impossible intentions) is currently unknown. For instance, researchers have demonstrated that participants attribute intentions to act based on a professed choice to intend to do something. And these intention attributions are not constrained by whether someone has good reasons to do that thing (Rose, Buckwalter, and Turri 2020). More specifically, participants denied that the protagonist had good reason to do something, such as drink a toxic chemical, but they nevertheless judged that he voluntarily intended to do it. The fact that intentions are attributed to agents lacking good reasons suggests that

intentions are viewed as highly controllable, though it does not answer the question of whether they are ever attributed to agents who believe that the outcome is impossible.

The hypothesis that it is conceptually possible to intend believed-impossible outcomes is also supported by research suggesting that mental states are generally viewed as voluntary in folk psychology. For example, researchers have shown that ten different mental states, including belief, opinion, faith, and fearlessness are attributed based on professed choice (Turri, Rose, and Buckwalter 2017: Experiments 1A-1B). This finding has subsequently been replicated and extended to show that many states are viewed as voluntarily controllable (Cusimano and Goodwin 2019). These results are highly suggestive but do not speak to the upper limits of intentional control.

We present three experiments testing support for impossible intentions in ordinary social cognition. These experiments are inspired by and closely follow several influential thought experiments from the action theory literature. The results confirm the prediction made by some philosophers that impossible intentions are conceptually possible. Across several contexts and probing methods, we find evidence that participants firmly countenance the possibility of intending believed-impossible outcomes. Experiment 1 demonstrates that it is conceptually possible to intend to do something that one believes is impossible. Experiment 2 tests a concern involving perspective-taking. Experiment 3 overcomes this concern by demonstrating that literal intention attributions are made when stronger behavioral evidence is given.

Before continuing, it is worth pausing to briefly consider what philosophers engaged in this debate mean exactly when they say that something is believed to be “impossible”. Thalberg, for instance, counts as impossible actions or events “whose

occurrence is incompatible with the truth of natural laws in which the agent believes,” such as flapping one’s hands so as to initiate flight, as well as those “for which the agent has no technical means,” such as curing diseases beyond current medical science (1962: 50). Examples offered by Ludwig involve impossibilities relating to either an agent’s bodily movement or something their bodily movements could have caused to happen (1992: 262-264). Still others, such as Anscombe, consider cases of psychological impossibility, such as resisting to break under torture (1957: 94). Given the various senses of “impossibility” invoked by different theorists across thought experiments, the following experiments were not designed with any one sense in mind. Rather, the experiments were designed to closely adhere to thought experiments in the philosophical literature by incorporating different senses employed by philosophers.

2. Experiment 1

2.1. Method

2.1.1. Participants

Five hundred forty people participated in the study. Their mean age was 36.83 years (range = 19-78, SD = 11.52), 43% (234 of 540) were female, and 97% reported native competence in English. No research on the topic existed to inform an a priori power analysis regarding sample size, so we decided in advance to recruit approximately 50 participants per condition, plus a few extra as a precaution against attrition. All manipulations and measures are reported. All participants were adult residents of the United States. No participants were excluded from analysis. We recruited and tested people using an online platform of

Amazon Mechanical Turk (<https://www.mturk.com>), TurkPrime (Litman, Robinson, and Abberbock 2017), and Qualtrics (<https://www.qualtrics.com>). Participants completed a brief demographic questionnaire after testing. We used R 3.5.1 for all analyses (R Core Team 2018). All stimuli, data, and code are available through an Open Science Foundation project (<https://osf.io/t5d7c/>). All studies were pre-registered utilizing the preregistration template from AsPredicted.org, which includes documenting the main research question being asked, key dependent variables, measures, and conditions used, as well as the sample size, and main and secondary follow-up analyses planned. In accordance with this template, however, no specific analysis predictions were registered. This is true of all experiments reported in the paper.

2.1.2. Materials and procedure

Participants were randomly assigned to one of ten conditions in a 2 (Status: impossible, possible) \times 5 (Scenario: operative, lifeguard, addict, math, car) experimental design. Participants first read a brief scenario, then responded to five test statements. In each scenario, an agent is confronted with a situation, says that a certain action is either impossible or possible, and then says the he or she will perform the action. In generating some of the different scenarios, we adapted thought experiments from the philosophical literature on intentions and action theory (Hedman 1970;Thalberg 1962;Ludwig 1992). Because the scenarios were designed to closely adhere to those given in the foundational theoretical literature, they differed in many incidental details, from the agent's predicament to the action of interest. There could be many interesting aspects of these differences worthy of pre-registering and testing in subsequent research projects (see below). For present purposes, however, we pre-registered scenario as a random factor for the purpose

of supporting the generalization of the results beyond the specific stimuli studied here (Baayen, Davidson, and Bates 2008; Clark 1973; Judd, Westfall, and Kenny 2012). Here is one scenario with the status manipulation shown in brackets (see appendix for all scenarios):

Arnold is a highly trained military operative. He has been captured by enemy forces and is about to be tortured. Arnold believes that as a matter brain chemistry, it is completely [impossible/possible] to withstand this kind of torture. After considering his oath to his country, Arnold says, “It’s [impossible but/possible and] I will withstand the torture.”

Beneath the scenario, on the same page, participants responded to three test statements (order fixed):

Arnold believes that it is impossible to withstand the torture. (believe)

Arnold intends to withstand the torture. (intend)

This is a pleasant situation for Arnold. (pleasant)

Participants then proceeded to a new screen and responded to two more statements (order fixed):

It was up to Arnold whether he intended to withstand the torture. (voluntary)

Arthur decided to withstand the torture. (decide)

Responses to all test statements were collected on a standard 7-point Likert scale, 1 (“strongly disagree”) - 7 (“strongly agree”), arranged left-to-right on the participant’s screen.

Item 1 was included to determine whether the status manipulation was effective (i.e. that people recognized that the agent believed that the relevant action was either

impossible or possible). Item 2 was included to determine whether participants attributed to the agent an intention to perform the action. Item 3 was included to provide a potentially useful control comparison and make agreement bias less likely. Items 4 and 5 were included as items of secondary interest to follow up on prior research suggesting that intentions are voluntary and viewed as being similar to decisions (Rose, Buckwalter, and Turri 2020).

2.2. Results

We expected that the status manipulation would be effective. The main research question was whether participants would tend to attribute the intention in both impossible and possible conditions. To assess the matter, we conducted a mixed linear analysis on the intention probe, with status, participant sex, and participant age as fixed effects, and scenario as a random effect (pre-registered analysis plan). We included sex and age in the analysis simply to evaluate the robustness of the finding and made no prediction about their effects or theoretical relevance (see pre-registration). We followed up with appropriate t-tests to determine whether mean response differed across conditions and from the midpoint.

The status manipulation was effective, with mean response to the belief attribution high in the impossible condition and low in the possible condition (see Fig. 1 and Table 2). The linear mixed effects analysis revealed an effect of status on intent attribution and an unpredicted effect of participant sex. A follow-up independent samples t-test revealed that mean response was higher in the possible condition (see Table 3). Mean response was lower for males ($M = 5.63$, $SD = 1.61$) than for females ($M = 5.98$, $SD = 1.28$), $t(537.13) = -2.85$, $MD = -0.36$ [-0.6, -0.11], $p = .005$, $d = 0.25$. A likelihood ratio test comparing the

fully specified mixed model to a comparable model without scenario revealed that scenario significantly affected intent attribution, log likelihood = -940, $\chi^2(1) = 29.3$, $p < .001$.

Table 1

Experiment 1. Analysis of variance for the mixed linear model's fixed effects

	Sum of squares	Df1	Df2	F	p
Status	148.956	1	535.001	84.363	<.001
Sex	11.788	1	535.115	6.676	.01
Age	0.675	1	535.649	0.382	.537

Attributions

Subjects made all five judgments. Dots overlay distributions and show means with 95% confidence intervals. Scales ran 1 (strongly disagree) - 7 (strongly agree).

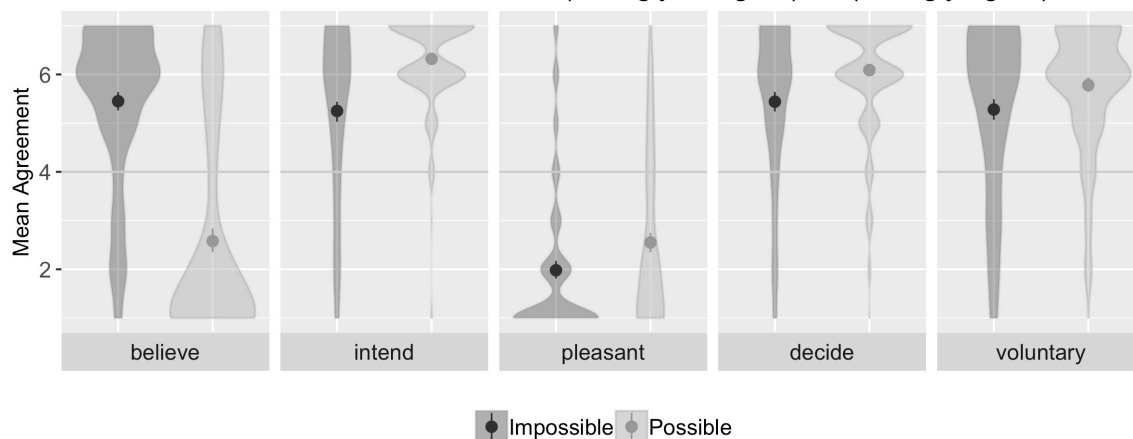


Figure 1. Experiment 1: Mean response overlaying distributions for the test statements (within-subjects) across two conditions (impossible, possible) (between-subjects). Scales ran 1 (“strongly disagree”) – 7 (“strongly agree”). Error bars show 95% bootstrapped confidence intervals.

Critically, follow-up one sample t-tests revealed that mean intent attribution was significantly above the midpoint in both the impossible and possible conditions (see Table 2).

Table 2
Experiment 1. One sample t-tests, test value = 4

Measure	N	M	SD	df	t	p	d
Impossible							
Believe	271	5.45	1.65	270	14.5	<.001	0.88
Intend	271	5.25	1.75	270	11.78	<.001	0.71
Pleasant	271	1.98	1.57	270	-21.21	<.001	-1.29
Decide	271	5.44	1.61	270	14.76	<.001	0.89
Voluntary	271	5.28	1.74	270	12.12	<.001	0.74
Possible							
Believe	269	2.58	2.12	268	-10.99	<.001	-0.67
Intend	269	6.32	0.9	268	42.3	<.001	2.58
Pleasant	269	2.55	1.72	268	-13.83	<.001	-0.84
Decide	269	6.09	1.13	268	30.27	<.001	1.85
Voluntary	269	5.78	1.26	268	23.17	<.001	1.41

Table 3
Experiment 1. Independent samples t-tests

Measure	Impossible Possible		MD	df	t	p	d
	M	M					
Believe	5.45	2.58	2.87	505.81	17.57	<.001	1.51
Intend	5.25	6.32	-1.07	403.92	-8.92	<.001	-0.77
Pleasant	1.98	2.55	-0.56	532.38	-3.98	<.001	-0.34
Decide	5.44	6.09	-0.65	485.42	-5.43	<.001	-0.47
Voluntary	5.28	5.78	-0.5	492.26	-3.82	<.001	-0.33

2.3. Discussion

This experiment examined whether it is thought possible to intend to do something that one believes is impossible. Participants read one of several brief scenarios in which agents say

that they will do something. The critical manipulation varied whether the agent believes that the action is impossible or possible. Participants then rated whether the agent intends to perform the action. The manipulation significantly affected intent attributions, with mean attribution higher when the agent believed the outcome was possible. Despite that difference, however, participants still tended to attribute intent when the agent believed that the outcome was impossible. This occurred in a context where participants themselves judged that the agent believed the outcome was impossible. These findings support the conclusion that it is conceptually possible to intend to do something that one believes is impossible. The results also support prior findings that intentions are regarded as voluntary and treated similarly to the way decisions are.

3. Experiment 2

This experiment tests whether the principal finding from Experiment 1 replicates using dichotomous probes for intent attribution.

3.1. Method

3.1.1. Participants

We decided in advance to recruit 75 participants per condition, plus a few extra as a precaution against attrition (see pre-registration). We recruited more participants per condition in this experiment because we planned to use weaker statistical tests (of proportions rather than means). Out of 310 participants recruited, 20 (6%) failed a comprehension question and were excluded from further analysis (pre-registered exclusion), yielding a final sample of 290. Their mean age was 36.93 years (range = 18-

71, SD = 11.7), 50% (146 of 290) were female, and 91% reported native competence in English.

3.1.2. *Materials and procedure*

Participants were randomly assigned to one of four conditions in a 2 (Status: impossible, possible) × 2 (Option: plain, contrast) between-subjects experimental design. Participants first read a brief scenario, then responded to a belief probe and intention probe. The scenario was the same one used for the math condition in Experiment 1. The status factor manipulated whether the agent thought that the outcome was impossible or possible. The option factor manipulated the answer options for the intention probe.

Sabrina is a prodigy in theoretical physics. She has tried to solve a particular mathematical proof her entire career. Sabrina believes that as a matter of mathematical laws, it is completely [impossible / possible] to solve the proof. After considering that a large prize will be given for the solution, Sabrina says, “It’s [impossible but / possible and] I will solve the proof.”

Beneath the scenario, on the same page, participants responded to two items (order fixed).

Sabrina believes it is _____ to solve the proof. (impossible / possible)

Sabrina _____ to solve the proof. (does not intend / does intend) [plain options]

Sabrina _____ to solve the proof. (is only telling herself she intends / actually does intend) [contrast options]

Participants rated only one intention attribution, using either the plain options or contrast options. All answer options were randomly rotated.

3.2. *Results*

We treated the belief attributions as a comprehension check (with exclusions mentioned above, see pre-registration). The principal questions of interest were whether the independent variables would affect intent attribution and, in particular, whether the participants would continue attributing intent in the impossible case when using the dichotomous response options. To assess this, we conducted binary logistic regression on the intention probe, with status, option, and participant age and sex as predictors. We followed up with appropriate proportion tests. Our analysis plan was pre-registered.

In one of the conditions (possible plain), 100% of participants attributed intent, resulting in complete separation when fitting the regression model. To address this, we fit the model using a penalized likelihood method (Firth 1993;Heinze 2006). There were main effects of status and option (see Fig. 2 and Table 4). However, even with the penalized bias correction, the standard errors on coefficient estimates remained high and inspection of Fig. 2 reveals that intent attributions were principally affected by an interaction between status and option, with the impossible contrast condition differing from the others. Follow-up binomial tests showed that intent attribution did not differ from chance in the impossible contrast condition, whereas it was significantly above chance in the other three conditions (see Table 5).

Intention attributions.

Error bars show 95% confidence intervals.

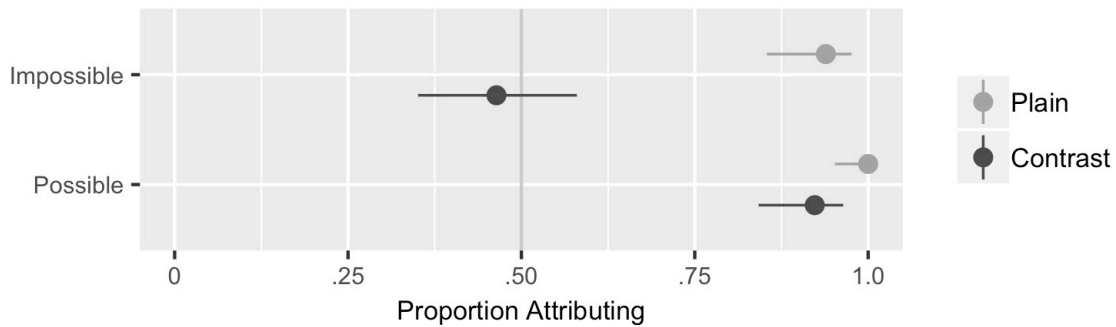


Figure 2. Experiment 2: Intent attributions across four conditions. Error bars show 95% confidence intervals.

Table 4

Experiment 2. Binary logistic regression predicting intent attributions; reference class for possible is impossible; reference class for contrast is plain; reference class for female is male

Term	p	OR	OR low	OR high
(Intercept)	<.001	18.518	4.203	96.774
Possible	.035	11.191	1.158	1494.604
Contrast	<.001	0.06	0.018	0.16
Female	.076	2.008	0.93	4.474
Age	.334	0.984	0.951	1.017
Possible: Contrast	.900	1.224	0.009	14.933

Table 5

Experiment 2. Proportions attributing intent along with binomial tests against chance in the four conditions.

Option	N	k	prop	test value	p	h
Impossible						
Plain	66	62	0.939	0.5	<.001	1.073
Contrast	69	32	0.464	0.5	.630	-0.073
Possible						
Plain	77	77	1	0.5	<.001	1.571
Contrast	78	72	0.923	0.5	<.001	1.009

3.3. *Discussion*

This experiment examined whether the principal finding from Experiment 1 replicated using dichotomous probes for intent attribution. Using scaled probes, Experiment 1 found evidence that it is conceptually possible to intend to do something that one believes is impossible: mean intent attribution remained high even when participants attributed the belief that the outcome was impossible. In the present experiment, we asked whether that pattern persisted when participants rated intent using a dichotomous probe. We manipulated whether the agent believed the outcome was impossible or possible. We also manipulated whether the dichotomous probe used plain options (“does not intend”/“does intend”) or contrast options (“is only telling herself she intends”/“actually does intend”). The pattern from Experiment 1 replicated for the plain options but not for the contrast options. When plain options were used, intent attribution remained very high even when the agent believed the outcome was impossible. But when contrast options were used, intent attribution went to chance rates when the agent believed the outcome was impossible.

One possible explanation for this finding is that intending a believed-impossible outcome is conceptually impossible, but when using scaled responses or plain dichotomous probes, many participants tend to perspective-take or otherwise defer to the agent’s apparent interpretation of the situation. Another explanation is that intending a believed-impossible outcome is conceptually possible but irrational, and many participants decline to attribute an irrational intention to the agent without stronger evidence that she actually holds the intention. In other words, they are charitably giving her the benefit of the doubt. This implies that if participants were given stronger evidence of the agent’s intent, then they would tend to attribute intent even when using the contrast options. The next

experiment investigates this possibility by testing a slightly modified scenario that enhances the agent's behavioral profile.

4. Experiment 3

4.1. Methods

4.1.1. Participants

We decided in advance to recruit 75 participants per condition plus some extra as a precaution against attrition (see pre-registration). Out of 159 participants recruited, 19 (12%) failed a comprehension question and were excluded from further analysis (pre-registered exclusion), yielding a final sample of 140. Their mean age was 35.75 years (range = 19-67, SD = 9.68), 49% (68 of 140) were female, and 92% reported native competence in English.

4.1.2. Materials and procedure

Participants were randomly assigned to one of two conditions (Status: impossible, possible). The materials and procedure were exactly the same as for the contrast-impossible and contrast-possible conditions from Experiment 2, with the only difference being a single sentence added to the end of the scenario: "Sabrina cancels all of her other work and focuses all her time, attention, and resources on this particular project."

4.2. Results

We treated the belief attribution as a comprehension check (see pre-registration). The principal question was whether participants would tend to attribute intent in the impossible condition. To assess this, we conducted binary logistic regression on the intention probe,

with status and participant age and sex as predictors. We followed up with appropriate proportion tests. Our analysis plan was pre-registered.

The regression model revealed a main effect of status, with attribution higher in the possible condition (see Table 6). Follow-up binomial tests showed that intent attribution was significantly above chance in both the possible condition (96%) and the impossible condition (82%) (see Fig 3. and Table 7).

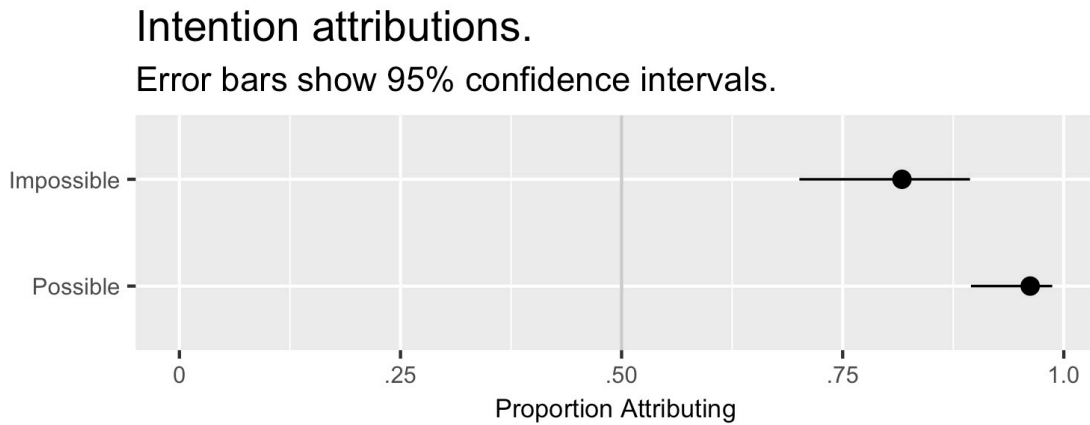


Figure 3. Experiment 3: Intent attributions across two conditions. Error bars show 95% confidence intervals.

Table 6

Experiment 3. Binary logistic regression predicting intent attributions. Reference class for possible is impossible; reference class for contrast is plain; reference class for female is male

Term	p	OR	OR low	OR high
(Intercept)	0.116	6.76	0.603	74.775
Status	0.008	6.12	1.783	28.367
Female	0.435	1.587	0.502	5.297
Age	0.559	0.982	0.926	1.047

Table 7

Experiment 3. Proportions attributing intent along with binomial tests against chance in two conditions

Status	N	k	prop	p	h
Impossible	60	49	0.817	<.001	0.686
Possible	80	77	0.962	<.001	1.181

4.3. Discussion

This experiment examined whether enhancing the agent's behavioral profile would lead participants to attribute intent at above chance rates for a believed-impossible outcome, even when the answer options encoded an appearance/reality distinction. Participants attributed intent at a very high rate (82%).

5. General Discussion

Philosophers are divided on whether one can intend to do something that one believes is impossible. Given this, we turned to the tools of experimental cognitive science for evidence that it is either conceptually possible or impossible. Our findings support the conclusion that intentions are viewed as highly controllable, so much so in fact that impossible intentions are indeed possible in ordinary social cognition. Across multiple cover stories and probing methods, we found that participants attribute intention to agents who believe that the relevant action is impossible.

While these findings suggest that impossible intentions are conceptually possible, the studies also have limitations. First, the fact that it is possible to intend what you believe is impossible does not mean that we are always or even commonly able to do that. Second, the findings do not challenge the claim that there could nonetheless be a close conceptual

connection between belief and intention. It is consistent with our findings that certain beliefs guide or even constrain intention and that the attributions above are exceptions to this norm. Third, while the findings support the conclusion that the ordinary intention concept allows for believed-impossible intentions, they do not answer questions about the normative status of that concept. Specifically, the findings do not tell us if impossible intentions are rational, advisable, consistent, or beneficial for agents to form (though see below). Further research is needed to answer questions concerning the degree, prevalence, or normativity of believed-impossible intentions.

Another potential limitation involves a more general issue concerning impossibility and natural indeterminism in experimental settings. As prior research has shown, it can often be incredibly difficult for participants to overcome the natural reaction that outcomes are indeterminate or to ever fully accept the stipulation that something is completely impossible (Rose, Buckwalter, and Nichols 2017). In the present experiments, we followed one narrative technique shown to be effective in prior research at getting people to go along with a stipulated impossibility (Turri 2017b, 2017a). However it is possible that participants might still be holding on to natural indeterminism on some level, and future research might develop new, more effective techniques to overcome this challenge moving forward.

The present studies also mark several opportunities for future research into the nature of believed impossible intentions. When modeling stimulus materials after foundational cases in the philosophical literature, we also noted that the cases do differ in several ways. For instance, one interesting philosophical difference between cases is the sense of “impossibility” in which something is believed to be impossible. In the present

experiments, materials utilized a range of senses, including metaphysical, physiological, and mathematical possibility, suggesting that the findings may generalize beyond any one sense. While suggestive, however, the matter requires dedicated pre-registered studies to specifically address. Another interesting philosophical difference involves the presence or absence of emotional or moral factors (e.g. overcoming drug addiction) or social roles (e.g. being a lifeguard). Future research might profitably explore the effect that these things have on the attribution of believed impossible intentions.

In addition to answering an important question about the concept of intention, the present research may also help to answer further questions about the definition and functional role of intention in folk psychology. It is natural to think of intentions as “settled objectives,” according to which a person has an intention if “they are committed to a goal, which guides their deliberation and which, in the normal case, they will eventually act to achieve” (McCann 1991, p. 26). Some philosophers have also endorsed what has been called the “simple view” that anyone who acts intentionally intends to do that act. However, this seemingly anodyne statement is called into question if one cannot intend to do what one believes is impossible. It is called into question because it would force us to say that people who have a settled objective to say, solve a mathematical proof they believe is impossible, both act intentionally yet do not intend to act. Though our experiments were not designed to test this specifically, they are broadly consistent with the settled objective account and repel this challenge to the “simple view” by affirming believed-impossible intentions as conceptually possible.

The fact that impossible intentions are conceptually possible may also shed light on the deeply motivational or aspirational qualities of intention, in at least two ways. It is

widely acknowledged that intentions are closely connected to motivating action. However, strictly ruling out all impossible intentions potentially limits this motivational quality. Beliefs are sometimes mistaken, of course, and beliefs about future actions are often formed with limited information or evidence in conditions of uncertainty. Thus, one possibility is that the concept allows for some impossible beliefs as a safeguard to preserve the motivational quality of intention against what may often be false beliefs about impossibility. Second, impossible intentions may be aspirational in nature. Intending to withstand torture or solve a mathematical proof we believe to be impossible may nonetheless inspire us to avoid potentially dangerous situations, develop new analytical skills, or cultivate other resources useful in future situations. In other words, the possibility of impossible intention may act as a pathway for self-improvement through aspirations to meet even impossible standards.

*School of Social Sciences
Department of Philosophy
University of Manchester*

*Department of Philosophy
Florida State University*

*Philosophy Department and Cognitive Science Program
University of Waterloo*

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Appendix

Materials for Experiment 1

Arnold is a highly trained military operative. He has been captured by enemy forces and is about to be tortured. Arnold believes that as a matter of brain chemistry, it is completely [impossible/possible] to withstand this kind of torture. After considering his oath to his country, Arnold says, "It's [impossible but/possible and] I will withstand the torture".

Arnold believes that it is impossible to withstand the torture.

Arnold intends to withstand the torture.

This is a pleasant situation for Arnold.

Arnold decided to withstand the torture.

It was up to Arnold whether he intended to withstand the torture.

Sally is a highly trained rescue worker. She is lifeguarding at a remote beach when a drowning swimmer washes up on shore. Sally believes that as a matter of lung physiology, it is completely [impossible/possible] to save the swimmer using CPR. After considering her duty to others, Sally says, "It's [impossible but/possible and] I will save the swimmer using CPR".

Sally believes that it is impossible to save the swimmer using CPR.

Sally intends to save the swimmer using CPR.

This is a pleasant situation for Sally.

Sally decided to save the swimmer using CPR.

It was up to Sally whether she intended to save the swimmer using CPR.

Jesse is a lifelong heroin addict. He has relapsed several times and no treatments have ever helped him resist his cravings. Jesse believes that as a matter of willpower, it is completely [impossible/possible] to resist the cravings. After considering the harm he has caused to his friends and family, Jesse says, "It's [impossible but/possible and] I will resist the cravings".

Jesse believes that it is impossible to resist the cravings.

Jesse intends to resist the cravings.

This is a pleasant situation for Jesse.

Jesse decided to resist the cravings.

It was up to Jesse whether he intended to resist the cravings.

Sabrina is a prodigy in theoretical physics. She has failed to solve a particular mathematical proof her entire career. Sabrina believes that as a matter of mathematical laws, it is completely [impossible/possible] to solve the proof. After considering that a large prize will be given for the solution, Sabrina says, "It's [impossible but/possible and] I will solve the proof".

Sabrina believes that it is impossible to solve the proof.

Sabrina intends to solve the proof.

This is a pleasant situation for Sabrina.

Sabrina decided to solve the proof.

It was up to Sabrina whether she intended to solve the proof.

Jones shares his driveway with an angry neighbor. His car broke down last night blocking his neighbor's car. Jones believes that because of the charge left in the battery, it is completely [impossible/possible] that the car will start. When his neighbor begins to threaten him, Jones says, "It's [impossible but/possible and] I will start the car".

Jones believes that it is impossible that the car will start.

Jones intends to start the car.

This is a pleasant situation for Jones.

Jones decided to start the car.

It was up to Jones whether he intended to start the car.