The influence of influence: the effect of task repetition on persuaders and persuadees

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Abstract

We investigate how the experience of influencing and of being influenced impacts on a subsequent, immediate attempt to influence and be influenced. We conduct an experiment using participant dyads matched in a round-robin design which systematically measures the influence one individual has on another in a decision task using a short, anonymous, computer mediated, text based exchange. Findings show that being influenced in a round of the task tends to be positively related to being influenced in the subsequent two rounds with the effect weakening each time. We find no impact on the ability to influence.

Keywords: persuasion; transfer of excitation; incentivised; experiment

1. Introduction

The topic of social influence in online contexts is an important and current one for decision support systems [51, 34, 47, 7, 49] yet many questions remain unanswered. The volume of messages, news and sponsored content that social media users consume is such that they likely receive multiple attempts to influence them every time they interact with their network. The impact of repeated attempts to influence is not fully understood. The following illustrates our study. Someone is persuaded to behave in a certain way. If another person immediately tries to influence them again, does the

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fact that they have already been persuaded mean that they will be more likely to be persuaded the second time, or less? Or will there be no difference? What about the person doing the persuading: will they be more likely to influence someone if they have successfully persuaded already?

Society is increasingly using the digitised opinions of others to help make decisions [35] and users of social media are constantly being bombarded by messages from organisations and individuals actively trying to influence them. Sponsored content (where an organisation pays a social media company to display an advert on a user's feed) is an obvious example but it is not the only one. Companies are increasingly using social media to communicate one-to-one with consumers in ways which affect consumer decision making [48]. Messages from acquaintances are important too. Knowing what friends think of a product or service plays a huge part in the adoption decision [40] and even product reviews from complete strangers on sites such as Amazon or eBay are known to affect an individual's purchase decision [39, 50, 14, 36]. Organisations understand this and are investing in social media [42]. Both Twitter and Facebook appear to be pinning their future on the ability of their users to influence each other by expanding their advertising efforts [11]. Examples also abound outside commerce. Social media played a large role in influencing young people in the UK to riot during the summer of 2011 [2] and in influencing the Arab Spring uprisings [45, 13].

We therefore investigate how ability to influence and susceptibility to influence vary in a repeated task. We study persuasion, where a persuader attempts to produce cognitive engagement in a persuadee leading to behavioural change. To do this we conduct an experiment which systematically measures the influence one person has on another in an incentivised decision task where the influence takes place through a short, anonymous, computer mediated, text based exchange. Matching of participant dyads in the task follows a round-robin design such that each persuader tries once to influence each persuadee. The design allows us to isolate and identify how a participant's ability or susceptibility to influence varies across rounds.

2. Theory

There is a long literature which examines the impact of message repetition on persuasion [38, 30, 3, 33]. Broadly, the findings show that repetition of a message strengthens positive attitudes toward it up to a point after which tedium flatlines the effect. For instance Cacioppo and Petty [4] compare listening to a message once versus three times and measure how favourably students rate its arguments. This tests mere exposure to a message and findings show that more favourable attitudes

are fostered by repetition of strong arguments, whereas less favorable attitudes are fostered by repetition of weak arguments. This has been applied in, for example, television advertising where an advert is repeated to audiences for a time, then is replaced with a fresh one featuring the same characters and message. The message is held constant but the advert itself does not get boring.

Our work is related to this literature yet distinct in that instead of repeating a set message we repeat a situation, a situation where an individual tries to persuade another. This is different because in each encounter, a persuader will use their own personal influencing strategy which may rely on charm, rational argument and even lies.

2.1. Persuadee effects

In terms of a person being persuaded, theory predicts that being influenced in Round R_i of our task will have an impact on being influenced in Round R_{i+1}. Excitation transfer theory [52] states that the arousal caused by a communication may last beyond the processing of that communication and impact on subsequent behaviour. This is because arousal in the nervous system decays slowly [53] allowing excitement from a stimulus to intensify a later emotional state. As our task is incentivised (which is to say it involves participants investing real money) any arousal will be greater than if the task was being played 'just for fun' [46, 27]. Therefore during the decay of arousal from Round R_i, an individual exposed to the provoking situation of Round R_{i+1} may misattribute the residual excitement of R_i to R_{i+1} and their behaviour will alter accordingly [32]. The original formation of excitation transfer theory deals explicitly with computer mediated communication but the theory has been applied in other contexts including romantic attraction [19], morality [6], physical exercise [53] and advertising [43].

In addition to excitation transfer, theory on cognitive dissonance also predicts that in order to avoid the mental stress of acting inconsistently, individuals in Round R_{i+1} will tend to act consistently with their decision in Round R_i [22, 17]. Both theories allow us to hypothesise a positive relationship between influence in Round R_i with influence in Round R_{i+1}:

> H1: how much an individual is influenced in a particular round will be positively related to how much they were influenced in previous rounds.

2.2. Persuader effects

In terms of the person doing the influencing, in hypothesising the relationship between attempting to influence once and attempting to influence again, we note

that humans learn from experience: The old saying that practice makes perfect is true. For example, previous research on social influence has identified approaches that sellers can use to influence prospective buyers [16, 31] and how leaders influence their employees [12] (see Cialdini and Goldstein [8] for a review). In this literature there is an emphasis on being able to learn from mistakes [23, 21]. The implication is that regardless of an influencer's performance in attempting to influence in Round R_i, they may learn something that will help them in Round R_{i+1}. Alternatively it is possible that bad habits (which is this context means poor influencing strategies) are developed. Therefore we do not expect to see a relationship between attempting to influence and attempting to influence again.

> H2: how much an individual is able to influence in a particular round will be unrelated to how much they were able to influence in previous rounds.

2.3. Measuring influence

Previous research in the area of decision support and online influence has measured influence indirectly. For instance Li and Shiu [29] use degree centrality to evaluate users' influence in a social network, which is to say, they count how many people an individual links with and use that count as a proxy for influence. In another example Li and Du [28] examine opinion leaders, again identifying them in part by how many people they link to. They verify this using an analysis of sentiment, examining how far a negative opinion from an opinion leader spreads through a network, although with no baseline measure of the receiving users' initial opinions. This approach of using network centrality stems largely from Kiss and Bichler [25] who examine a range of centrality measures to determine which users are best placed to measure spread of influence, although doing this has been questioned by Watts [44]. Alternatively Monteserin and Amandi [34] analyse influence using an agent based model, identifying the most influential nodes in a network using historical data.

We take a very different approach to measuring influence. By designing a decision task—which is described next—we quantify the influence one person has made on another, calibrating this with a baseline measure of behaviour prior to the influencing attempt. This is a key novel aspect of our work.

3. Decision Task

The decision task involved participants looking at a series of image pairs, answering a question about each, and then deciding how much of an endowment to invest in their answer. Incentives were set such that a person confident in their answer

would invest more. Three types of images were used. In the first, participants were shown two monochrome pictures and asked which of the two contained more black than white. In the second, participants were shown two locations and asked which of them was in a particular country. Lastly, participants were shown two pictures taken from the website 'RateMyFace.com' and asked which of the two was rated the highest by users of the site[1]. Each of these questions has an objective right/wrong answer. Examples are shown in Figure 1.

The decision task was made up of three sub-tasks A, B and C, with each participant assigned throughout to one of two roles, sender or receiver. In Task A, an accustomisation task, all participants were independently shown an image pair and asked one question about it. Then they decided how much v of a 100 token endowment to invest in their answer, where $0 \leq v \leq 100$. The payoff r was calculated to be:

$$r_1 = \begin{cases} 100 + \frac{v}{2} & \text{if correct} \\ 100 - v & \text{if incorrect} \end{cases}$$

This was repeated with nine image pairs (three of each of the three types). This task had the purpose to familiarise participants both with the image task and investment decision.

In Task B, a sender was paired with a responder. Senders were shown three image pairs, one of each type, and had to answer a question on each and invest as before from a fresh endowment. Receivers were asked the same questions as the senders but were not shown the images. Receivers were given the opportunity to invest in their sender's decisions. This time, a receiver's payoff r_2 was calculated the same way as for r_1, while a sender's r_2 depended on v_p, how much their receiver decided to invest:

$$r_2 = \begin{cases} 100 + \frac{v}{2} + v_p \times 1.5 & \text{if correct} \\ 100 - v & \text{if incorrect} \end{cases}$$

The purpose of this task was to gauge receivers' tendency to invest in sender decisions without communication, as a benchmark against which to compare how much receivers invest in the third task where communication was allowed. It was through this communication that influence took place.

In Task C, again senders and receivers were paired. Senders were shown an image pair and asked a question on it. They answered and invested in their answer

[1]RateMyFace allows users to upload pictures of people and rate the pictures others have uploaded according to how beautiful they think they are, using a scale from 1-10.

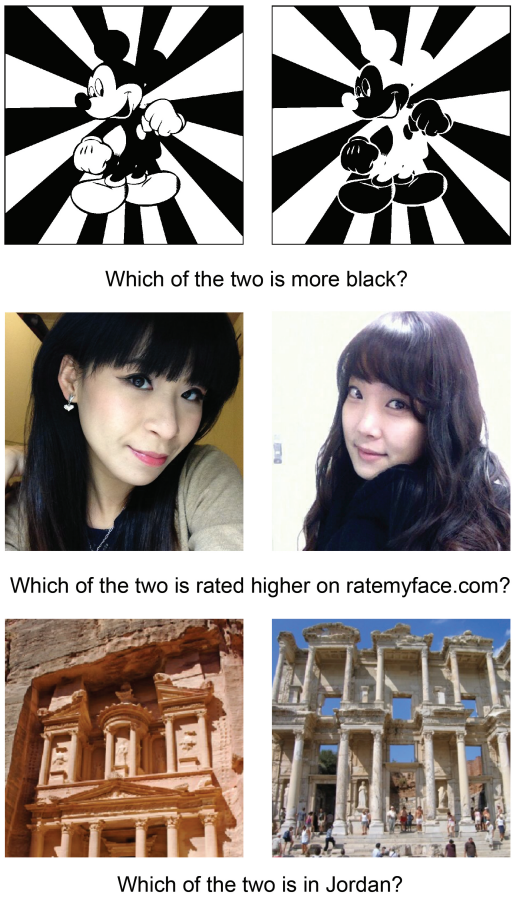

Figure 1: Examples of the image pairs along with the question subjects were asked.

as before. Receivers were not shown the image, only the question. At the end of a set time, and after senders had invested, senders and receivers could communicate by text chat for 90 seconds. At the end of this communication period, receivers answered the question and invested in their answer. This was repeated nine times (three of each of the three image types) in a round robin pairing such that each sender communicated once with each receiver. The payoffs were the same as for Task 2, and all subjects knew this.

The payoff structure r_2 is such that senders were incentivised—in a way that both senders and receivers understood—to influence receivers to invest as much as possible. At all times subjects were unaware of their pair's identity. Feedback about question accuracy and earnings was given after completion of each of the three tasks. Because Tasks B and C differ only in communication, the difference in a receiver's average investment between these two tasks provides a measure of influence.

To summarise our influence metric, Task B measures the risk that receivers will take in answering the question associated with each image pair type. The measure of the influence of senders on receivers is the absolute difference between the average amount receivers invested in Task C minus the amount they invested in the same type of image pair in Task B. We label this metric 'susceptibility to influence.'

Susceptibility to influence has face validity. In the task a reward for being correct is lower than a loss for being incorrect meaning that participants are incentivised to invest less when they are unsure of the answer[2]. We piloted several different payoff structures and used the one which gave the best range of responses, with participants choosing to invest a high amount of money where they had a high degree of confidence in their decision, and a low amount (or zero) when they were not confident. Rational senders will act within whatever their ability to persuade receivers to change their behaviour, while rational receivers—if they did not communicate with the senders—would act in Task C as they did in Task B [10]. Therefore any difference is due to their experience of communicating with their sender. At face value this difference is a measure of influence.

[2]If the reward and loss were equal then even when participants did not know the answer and so would have to choose at random, a risk neutral participant (someone who is neither looking for a gamble or a safe bet) would be indifferent between investing all their endowment and none of it. Given the payoff structure, a risk neutral participant needs to be 67% certain that they know the right answer before they are prepared to invest in their decision. The 67% comes from a game theory analysis of our task. The expectation of a gamble is the probability of success times the outcome, so if the probability of success is 0.67 (two thirds) and the outcome is 1.5 times what you put in, 1.5 * 0.67 is 1. Therefore 67% is the point after which a participant would start winning more money that if they simply did not invest at all.

Susceptibility to influence is based on game theory [5], rational choice theory [41] and theories of persuasion [37] which gives it some amount of construct validity. In addition, sender and receiver tasks (or games) like ours are common in the literature since Crawford and Sobel [9] and are accepted to have reliability (which is to say, they produce similar results under similar conditions).

4. Procedure

Volunteer participants were recruited from the undergraduate student population of a large UK university using posters and in-class announcements. There were 12 sessions each with 18 participants (n=108 senders, 108 receivers). Sample sizes were chosen based on judgement: We were working with a new experimental design, measuring something which has never been measured in an anonymous, incentive-compatible environment, and had therefore had no prior guidance or precedent on how big the effect sizes might be or about statistical power. However the size we used was enough to reveal significance.

Sessions lasted about 90 minutes. Upon arrival, participants were randomly assigned to either the role of sender or receiver and allocated to separate laboratories accordingly. Sessions started with general announcements and gaining informed consent. Participants then received paper instructions and were tested in them with a comprehension quiz to ensure all participants fully understood the task. The instructions made all parts of the experiment, including the incentive scheme, common knowledge among all participants. Laboratory discipline and privacy of decision making were strictly enforced throughout. In both labs the tasks were administered at partitioned computer booths using the software application z-Tree [18]. The program matched participants, displayed the image pairs, prompted for decisions and recorded their answers.

At the end of the session, participant earnings were determined as the total number of points earned over the three tasks, converted at the rate of GBP 0.4 per 100 points plus a flat participation fee of GBP 10. On average, participants were paid out around GBP 21 (maximum: 25, minimum: 15) in cash delivered privately, immediately after the session.

5. Analysis

To assess how susceptibility to influence depends on previous attempts at being influenced, we regress how much receivers were influenced in Round R_2 through to R_9 on how much they were influenced in the previous rounds. We control for the age and sex of both senders and receivers, the risk behaviour, persuadability and trusting

behavior of receivers, and the amount invested by senders. Risk was measured using metrics sourced from Dohmen et al. [15] who introduce seven independent attitude-based measures of willingness to take risk, each using a single question with responses between zero (completely unwilling) and ten (completely willing). These questions relate to risk in different contexts such as health, career, finances and leisure and also include a hypothetical lottery scenario. Out of the seven we selected financial risk and the lottery items as being relevant to our task. Persuadability is measured with a construct from Kotov et al. [26] who use 14 items to measure openness to others' advice, opinions and ideas. Trusting behavior is measured using three questions on generalised trust from the U.S. General Social Survey [20]. The items used to measure each are presented in Appendix A.

To clarify, using Round R_4 as an example, in plain text the regression is:

> Influence in R_4 = Influence in R_3 + Influence in R_2 + Influence in R_1 + Control variables

The results are shown in Tables 1 and 2. The p-values highlighted in bold in the upper half of Table 1 suggest that if an individual is influenced to invest, and then immediately influenced again, the second attempt will tend to be positively related to the first: the more an individual invests in Round R_i the more they will invest in Round R_{i+1}. There is some evidence that the effect lasts into Round R_{i+2} (seen in the columns labelled 3, 6 and 8 in Table 1). The effect sizes in all columns show that the effect weakens from Round R_{i+1} to Round R_{i+2}.

Table 2 shows the results for the individuals trying to influence others and reveals no relationships across the rounds: if an individual influences someone and then tries immediately to influence someone else, the experience of the first attempt has no impact on the second.

	2	3	4	5	6	7	8	9
Inf. 8	–	–	–	–	–	–	–	.50(.09)
								0.000
Inf. 7	–	–	–	–	–	–	.37(.09)	.14(.09)
							0.000	0.097
Inf. 6	–	–	–	–	–	.08(.11)	.26(.10)	-.01(.09)
						0.501	**0.008**	0.882
Inf. 5	–	–	–	–	.23(.11)	.10(.13)	.19(.11)	.10(.09)
					0.040	0.440	0.072	0.292
Inf. 4	–	–	–	.24(.11)	.28(.11)	-.09(.13)	-.10(.11)	.21(.09)
				0.026	**0.013**	0.506	0.362	**0.033**
Inf. 3	–	–	.19(.10)	.08(.10)	-.09(.11)	.03(.12)	.06(.10)	-.00(.08)
			0.052	0.375	0.400	0.773	0.531	0.971
Inf. 2	–	.30(.10)	-.12(.10)	.07(.10)	.12(.11)	.11(.12)	.05(.11)	.14(.09)
		0.004	0.222	0.474	0.290	0.384	0.621	0.138
Inf. 1	.16(.12)	.21(.12)	.02(0.10)	-.17(.10)	-.09(.11)	-.01(.14)	-.12(.11)	-.01(.09)
	0.115	**0.050**	0.856	0.099	0.442	0.926	0.270	0.923
R age	-.34(1.08)	.65(1.09)	-.32(1.04)	-.28(1.05)	-.90(1.13)	-.10(1.26)	1.95(1.11)	.00(.95)
	0.754	0.549	0.758	0.791	0.427	0.934	0.083	0.997
R sex	-6.69(5.17)	-6.77(5.26)	8.48(5.07)	1.50(1.01)	-9.32(5.50)	-2.13(6.19)	-.64(5.29)	1.34(4.63)
	0.199	0.201	0.098	0.768	0.093	0.731	0.904	0.773
R risk	.69(1.17)	.91(1.20)	-1.75(1.15)	.87(1.17)	3.12(1.28)	-.70(1.48)	-.15(1.25)	1.61(1.09)
	0.560	0.452	0.132	0.453	**0.017**	0.636	0.907	0.142
R pers.	.71(.11)	-.18(0.14)	.82(.13)	.13(.15)	-.07(.17)	.30(.19)	.02(.16)	-.29(.14)
	0.000	0.189	**0.000**	0.391	0.689	0.108	0.896	**0.039**
R trus.	-4.11(6.09)	-11.94(6.20)	-6.38(6.05)	1.72(6.21)	-5.76(6.64)	-3.98(7.37)	-0.43(6.22)	7.73(5.43)
	0.501	0.057	0.294	0.782	0.388	0.591	0.945	0.158
S age	.38(1.02)	.65(1.03)	-.84(.99)	1.50(1.01)	.39(1.09)	-.58(1.34)	-.47(1.08)	1.27(.92)
	0.711	0.529	0.395	0.142	0.719	0.665	0.663	0.171
S sex	-1.99(5.03)	3.96(5.16)	5.88(4.99)	4.82(5.06)	-10.48(5.27)	-12.33(6.09)	-5.89(5.09)	-1.26(4.65)
	0.693	0.445	0.242	0.343	**0.050**	**0.046**	0.250	0.787
S inv.	.33(.27)	.12(.09)	.23(.13)	.16(.08)	-.03(.08)	-.07(.13)	.11(.09)	.10(.07)
	0.219	0.165	0.105	**0.048**	0.742	0.601	0.196	0.174
R^2	.36	.23	.44	.19	.26	.16	.37	.47

Table 1: Effect size and p-values of regressing susceptibility of receiver to influence in Rounds 2 to 9 on susceptibility of receiver to influence in previous rounds. 'S' here is the sender (persuader), 'R' the receiver (persuadee). Inf. x is receiver's susceptibility to influence in Round x. Risk, pers. and trus. are self-reported measures of receiver's risk taking behavior, presuadability and trustingness, as explained in the text. Inv. is the amount the sender invested. For sex, male was coded as 1. White rows show OLS regression estimates with standard errors in brackets, p-values are shown in highlighted rows underneath. Results at 5% sig are highlighted in bold, n=180.

	2	3	4	5	6	7	8	9
Inf. 8	–	–	–	–	–	–	–	-.02(.10)
								0.848
Inf. 7	–	–	–	–	–	–	.21(.10)	.02(.10)
							0.035	0.868
Inf. 6	–	–	–	–	–	-.02(.11)	0.21(.10)	.12(.10)
						0.871	**0.051**	0.254
Inf. 5	–	–	–	–	-.08(.11)	.09(.12)	-.25(.11)	.02(.11)
					0..482	0.448	**0.026**	0.874
Inf. 4	–	–	–	.03(.08)	-.08(.09)	.00(.10)	.00(.09)	.06(.10)
				0.731	0.383	0.962	0.964	0.539
Inf. 3	–	–	-.17(.09)	-.02(.09)	-.12(.10)	-.03(.11)	-.03(.10)	-.00(.11)
			0.062	0.831	0.237	0.769	0.794	0.964
Inf. 2	–	-.06(.09)	-.03(.08)	.04(.08)	.03(.09)	.02(.10)	-.03(.10)	.23(.09)
		0.510	0.737	0.607	0.742	0.870	0.786	**0.014**
Inf. 1	.02(.10)	.19(.10)	.09(.09)	.12(.10)	-.04(.12)	-.20(.12)	.12(.11)	.16(.11)
	0.983	0.062	0.338	0.232	0.699	0.091	0.361	0.135
R age	-.50(1.13)	.59(1.15)	-.22(1.04)	-.05(1.11)	-.99(1.21)	-.50(1.29)	1.67(1.31)	-.10(.1.29)
	0.659	0.609	0.830	0.966	0.417	0.701	0.205	0.937
R sex	-4.78(5.11)	-7.10(5.40)	8.33(4.96)	0.02(5.11)	-8.66(5.62)	-3.75(5.99)	-5.30(5.85)	-1.97(5.73)
	0.351	0.187	0.097	0.996	0.127	0.533	0.368	0.732
R risk	1.00(1.18)	1.90(1.24)	-1.45(1.15)	.03(1.19)	2.30(1.33)	-0.59(1.42)	-.36(1.39)	1.29(1.30)
	0.397	0.129	0.209	0.978	0.086	0.677	0.798	0.323
R pers.	.76(.11)	.13(.12)	.75(.11)	.32(.11)	.25(.12)	.38(.13)	.23(.13)	.26(.13)
	0.000	0.271	**0.000**	**0.004**	**0.046**	**0.004**	0.075	**0.048**
R trus.	-4.96(6.15)	-15.62(6.57)	-10.12(5.97)	-2.88(6.29)	-7.28(6.84)	-4.95(7.15)	-4.70(7.01)	-.94(6.88)
	0.421	**0.019**	0.093	0.649	0.291	0.491	0.504	0.891
S age	.33(1.03)	0.52(1.08)	-.53(.99)	1.19(1.04)	-.27(1.15)	-.78(1.19)	-.17(1.18)	.81(1.14)
	0.752	0.629	0.595	0.258	0.818	0.517	0.889	0.481
S sex	-3.13(5.04)	0.83(5.39)	5.51(4.98)	3.32(5.16)	-10.16(5.63)	-12.48(6.21)	-.73(5.97)	2.92(5.90)
	0.536	0.878	0.271	0.521	0.075	**0.047**	0.903	0.622
S inv.	.33(.28)	0.15(.09)	.16(.14)	.07(.08)	-.00(.08)	-.05(.13)	.02(.10)	-.01(.09)
	0.239	0.106	0.263	0.420	0.969	0.693	0.809	0.910
R^2	.34	.15	.44	.13	.17	.17	.21	.14

Table 2: Effect size and p-values of regressing ability of sender to influence in Rounds 2 to 9 on ability of sender to influence in previous rounds. 'S' here is the sender (persuader), 'R' the receiver (persuadee). Inf. x is receiver's susceptibility to influence in Round x. Risk, pers. and trus. are self-reported measures of receiver's risk taking behavior, presuadability and trustingness, as explained in the text. Inv. is the amount the sender invested. For sex, male was coded as 1. White rows show OLS regression estimates with standard errors in brackets, p-values are shown in highlighted rows underneath. Results at 5% sig are highlighted in bold, n=180.

6. Discussion

This paper started with the following questions. Someone is persuaded to behave in a certain way. If another person immediately tries to influence them again, does the fact that they have already been persuaded mean that they will be more likely to be persuaded the second time, or less, or will it make no difference? Our results suggest that they will be more likely to be influenced both in the second and possibly the third attempt to influence them. What about the person doing the persuading: will they be more likely to influence someone if they have successfully influenced already? Here results show no difference – successfully influencing once does not improve (or reduce) the likelihood of influencing again. Instead, the most important factor in a sender being able to influence a receiver is the persuadability of the receiver. (This is seen in the 'R pers' row in Table 2.) We find no evidence that any other factor consistently matters. Therefore we have found support for both hypotheses. We study a repeated situation rather than a repeated message, in the context of online, text based communication. This has clear application in social media where users are constantly being bombarded with text messages, many of which are trying to influence their behaviour using a tailored strategy.

Answering questions on influence can often be made difficult because of homophily, the tendency of people to form relationships with those who they are similar to. This confounds the ability to measure how much one person in a relationship dyad has influenced another to behave like them with how alike they were in the first place [24, 1]. Our decision task controls for this by 1) randomly assigning links between senders and receivers: subjects did not get to chose their partner at any time, and 2) by anonymising the communication: subjects did not know anything about their partner.

This is the first time our decision task has been used to measure influence. The measure represents a departure from existing approaches to measuring influence in the field of decision support that rely on network degree, and this is a key novel aspect of our work (although we note that other studies were conducted in the field while ours requires the control of an experiment). The use of a round robin design allows for our study of the 'influence of influence' but the measure itself could be used to study persuasion in experiments looking at a range of contexts. The basic structure of our task could easily be re-used and this opens up new possibilities in decision support research that uses influence as a variable.

To begin, future research could look at our result in different contexts. Our findings apply to anonymous, text based influence but the excitement which leads to the effect we found could perhaps be dampened in other contexts. An effect such as post purchase dissonance for instance will likely prevent someone from being

influenced to buy a second car immediately after buying a first. The impact of this dissonance should be fully investigated.

Another future research goal is to examine a range of communication channels. Obvious among these would be audio, video-call and face to face communication, each of which would introduce challenges to control for homophily. Another more subtle research question would be addressed by repeating our study, this time giving feedback at the end of each round rather than at the end of all rounds. We hypothesise that senders under this treatment could be encouraged by, and learn from, any success in influencing and that we would then find a positive relationship between ability to influence in Round R_i and later rounds. Lastly we note that excitation transfer theory and theory on cognitive dissonance both predict our results but we are unable with our current dataset to distinguish between the two. Future research should investigate this.

Appendix A. Control variables

The following are the items used in the survey to measure risk, persuadability and trusting behaviour.

Risk (from Dohmen et al. [15])

1. How would you rate your willingness to take risks in financial matters?
2. Imagine that you had won 1,000,000 in the lottery. Almost immediately after you collect the winnings, you receive the following financial offer from a reputable bank, the conditions of which are as follows: There is the chance to double the money within 2 years. It is equally possible that you could lose half of the amount invested. You have the opportunity to invest the full amount, part of the amount or reject the offer. What share of your lottery winnings would you be prepared to invest in this financially risky, yet lucrative investment?
   (a) 1,000,000; (b) 800,000; (c) 600,000; (d) 400,000; (e) 200,000; (f) Nothing, I would decline the offer

Persuadability (from Kotov et al. [26])

1. A logical argument can make me change my mind.
2. I can be convinced by a good argument.
3. I find other peoples advice helpful in making decisions.
4. When making a decision, I often follow other peoples advice.
5. I don't mind changing my opinion after hearing a different point of view.

6. The more I am exposed to other peoples views, the more my own view of the world changes.
7. I get many good ideas from others.
8. I trust the advice of experts.
9. If I had an opinion that no one else shared, I would seriously question it.
10. I usually can be persuaded by a well-written editorial.
11. I am easily influenced by other peoples opinions.
12. In a discussion I often use arguments that Ive heard other people make.
13. When discussing politics I often find myself using arguments that I recently read or heard on TV.
14. I frequently change my opinion after talking with others.

Trusting behaviour (from Glaeser et al. [20])

1. Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?
2. Would you say that most of the time people try to be helpful, or that they are mostly just looking out for themselves?
3. Do you think most people would try to take advantage of you if they got the chance, or would they try to be fair?

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