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Stolen elections: How conspiracy beliefs during the 2020 American presidential elections changed over time

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Abstract

Conspiracy beliefs have been studied mostly through cross-sectional designs. We conducted a five-wave longitudinal study ($N = 376$; two waves before and three waves after the 2020 American presidential elections) to examine if the election results influenced specific conspiracy beliefs and conspiracy mentality, and whether effects differ between election winners (i.e., Biden voters) versus losers (i.e., Trump voters) at the individual level. Results revealed that conspiracy mentality kept unchanged over 2 months, providing first evidence that this indeed is a relatively stable trait. Specific conspiracy beliefs (outgroup and ingroup conspiracy beliefs) did change over time, however. In terms of group-level change, outgroup conspiracy beliefs decreased over time for Biden voters but increased for Trump voters. Ingroup conspiracy beliefs decreased over time across all voters, although those of Trump voters decreased faster. These findings illuminate how specific conspiracy beliefs are, and conspiracy mentality is not, influenced by an election event.

KEYWORDS
American presidential elections, conspiracy mentality, individual change, latent growth model, longitudinal study, specific conspiracy beliefs

The 2020 American presidential elections yielded many conspiracy beliefs that the elections were rigged. These beliefs were further fueled by the conspiratorial rhetoric of Donald Trump himself, and by the late counting of mail ballots that in various states changed an apparent Trump lead into a Biden win. Election-related conspiracy theories appeared regularly in conservative media in the aftermath of the election. These widespread conspiracy theories were consistent with the idea that people are particularly susceptible to such conspiracy theories when their political party loses the elections (Uscinski & Parent, 2014).

How does an election event shape conspiracy beliefs? Many different conspiracy theories exist across cultures or time, but they have one commonality: There is a secret, powerful organization colluding to harm others (Butter & Knight, 2020; Douglas et al., 2019; van Prooijen & van Vugt, 2018). Indeed, belief in different conspiracy theories appears grounded in a similar thinking style (Uscinski & Parent, 2014; van Prooijen & van Vugt, 2018). For instance, Swami et al. (2010) found that believing one conspiracy theory is associated with beliefs in other, conceptually unrelated conspiracy theories. To some extent, conspiracy thinking may reflect a dispositional propensity for explaining events in the world with beliefs that those events were caused or manipulated by conspiracies, which is also referred to as conspiracy mentality (Imhoff & Bruder, 2014). However, some conspiracy theories provide an explanation for concrete and specific events in society; for example, COVID-19 conspiracy theories appeared as a response to the pandemic. Given this difference between a "stable" conspiracy mentality versus situational, "dynamic" conspiracy beliefs (Brotherton et al., 2013; Imhoff et al., 2022; Imhoff & Bruder, 2014; Uscinski et al., 2017), Federico et al. (2018) presented two manifestations of conspiracism: General conspiracy thinking (a broad explanatory style) and conspiracy theory

endorsement (acceptance of a conspiracy theory in a specific context). We hence distinguish between general conspiracy mentality versus specific conspiracy beliefs.

Longitudinal studies are crucial for understanding the development of conspiracy theories, however, only few were conducted in the past; particularly studies exploring individual growth in conspiracy thinking are not well-represented in the literature. In this research, we investigate how both specific conspiracy beliefs and general conspiracy mentality developed over time in the weeks before and after the American 2020 presidential elections. We pursue three more specific aims. First, we assess the impact of an election outcome on belief in conspiracy theories using a five-wave longitudinal design (two waves before, and three waves after, the election). Second, we examined differences between Biden versus Trump voters in how conspiracy mentality and specific conspiracy beliefs have developed over time, in relation to the election outcome. Third, our study is designed to investigate potential differences between specific conspiracy beliefs versus conspiracy mentality in their sensitivity to the election outcome. While it has been widely assumed that conspiracy mentality is a stable individual difference variable (Imhoff & Bruder, 2014; for a review, see Imhoff et al., 2022), research hitherto has not provided evidence for this. If conspiracy mentality indeed is relatively stable over time, one may expect it not to change much, even against the background of a highly polarized election event.

1 | GROUP CONFLICT AND CONSPIRACY BELIEFS

The American political landscape is relatively polarized between Democrats and Republicans (Iyengar et al., 2019). The presidential elections therefore provide a setting that elicits strong intergroup conflicts between these political parties, given that perceiving threat of losing against the opposing party elicits negative attitudes towards outgroup members (Riek et al., 2006), while being affiliated to a political party predicts ingroup favoritism (Balliet et al., 2018). After the election, the losers are likely to experience more resentment, and less tolerance towards the winners, than vice versa (Bilali & Godfrey, 2021).

Previous research has indicated that conspiracy theories often emerge in such an intergroup setting (Cichocka et al., 2016; van Prooijen & van Lange, 2014). Liberals and conservatives therefore often hold conspiracy beliefs that implicate the other party (Miller et al., 2016; Uscinski et al., 2016). Likewise, Edelson et al. (2017) found that partisanship motivated beliefs in election fraud during the 2012 US presidential election. Also in many other settings, intergroup conflict predicts increased intergroup conspiracy theories, particularly when people feel threatened (Jolley et al., 2018; Mashuri & Zaduqisti, 2013; van Prooijen, 2020). For example, intergroup threat increases conspiracy beliefs among Muslims in Indonesia that blame the Western world for terrorist attacks in their country (Mashuri & Zaduqisti, 2015). During the US-China trade war, feelings of outgroup threat were associated with increased intergroup conspiracy beliefs (i.e., beliefs that institutions of the other country secretly conspire to harm one's own country) among citizens of both countries (van Prooijen & Song, 2021). Finally, anti-Semitic sentiments often translate into Jewish conspiracy theories (e.g., Golec de Zavala & Cichocka, 2012; Swami, 2012).

In these processes, conspiracy theories are particularly likely among members of the relatively powerless group (c.f., Abalakina-Paap et al., 1999). This idea is related with the broader insight that feelings of powerlessness and uncontrollability facilitates belief in conspiracy theories (Kofta et al., 2020; Šrol et al., 2021; van Prooijen & Acker, 2015; Whitson & Galinsky, 2008). Likewise, feelings of uncertainty are associated with conspiracy thinking (Newheiser et al., 2011; van Prooijen & Jostmann, 2013). Such aversive feelings instigate a sense-making process that blames a conspiracy of hostile outgroup members for these aversive feelings (van Prooijen, 2020). In the political realm, conspiracy theories therefore may be a coping mechanism for citizens to deal with feelings of powerlessness following election loss (Uscinski & Parent, 2014). Conspiracy theories asserting that the elections were rigged hence may be expected to increase (from pre- to post-election) particularly among voters for the losing party or decrease among voters for the winning party.

Previous research, however, has not examined individual changes over time in conspiracy thinking throughout the course of an election. This research provides the first investigation, at both the individual and group levels, of change in conspiracy belief over time during an election. We specifically focus on beliefs that elections were rigged, which is a particularly relevant conspiracy theory in this particular context. It is certainly possible that also other conspiracy theories emerge during an election, and that these theories draw widespread support, but to keep the study focused we did not include these.

1.1 | The present research

In the context of the US elections, Enders et al. (2021) found that besides political identities, also conspiracy thinking (i.e., conspiracy mentality) is a good predictor of beliefs in election fraud (i.e., specific conspiracy belief). The present research extends previous research using pre- and post-election measures of specific conspiracy beliefs, and conspiracy mentality. Specific conspiracy theories (e.g., beliefs that the elections are rigged) arguably are malleable as they are tied to a specific context, and can therefore be influenced by the positive or negative feelings associated with the (expected or actual) election outcome. Such malleability depends on actual contextual changes: Some researchers have found that beliefs in COVID-19 conspiracies remained stable during 4 months in 2020 (Romer & Jamieson, 2020), however, the state of the pandemic also did not change much during these 4 months.

In an election, the situation can change dramatically within a short period of time, particularly after the election results. Although Mancosu and Vassallo (2022) observed a decrease in classic conspiracy beliefs over 4 years, how conspiracy beliefs change following specific election results is yet unknown. Our line of reasoning suggests

that beliefs that the elections were rigged by the other party should drop among voters of the winning candidate (Biden) but increase among voters of the losing candidate (Trump). In contrast, conspiracy mentality has been argued to be a trait-like predisposition (Imhoff & Bruder, 2014). If this is the case, then levels of conspiracy mentality should remain largely unaffected by the election outcome. In this research, we examine the different trends over time of election-related specific conspiracy beliefs and conspiracy mentality against the background of the 2020 American presidential elections. By analyzing growth curve models, we could capture the individual change of conspiracy beliefs and conspiracy mentality over time.

Intergroup conspiracy beliefs are often endorsed against another group, and are therefore regularly referred to as outgroup conspiracy theories (Cichocka et al., 2016; van Prooijen & Song, 2021). However, in election-related conspiracy beliefs, it is possible that people endorse ingroup conspiracy theories as well: For example, one may vote for Trump despite believing that the Trump campaign did not play fair during the elections. Researchers have found that believing in one conspiracy theory predicts believing in other, unrelated conspiracy theories (Goertzel, 1994). As supported by many studies, conspiracy theories can be used as motivated reasoning strategy to serve specific goals (Edelson et al., 2017; Enders & Smallpage, 2019; Kossowska & Bukowski, 2015; Miller et al., 2016; Uscinski et al., 2016). In an intergroup conflict setting, however, motivations to endorse outgroup conspiracy theories are different from ingroup conspiracy theories, suggesting that the temporal change of ingroup versus outgroup conspiracy beliefs also differs, especially after the election. Such ingroup conspiracy theories may also be malleable over time; however, it is less clear how such beliefs are related to an election outcome, or whether people may hold conspiracies from within their ingroup accountable for election results. In a more exploratory fashion, we therefore also examine ingroup conspiracy theories in the current study.

This study was conducted between October 13 and December 20, in 2020. Participants completed two waves before and three waves after the American presidential election, with each wave measuring election-related conspiracy beliefs and conspiracy mentality. This research has been ethically approved by the Scientific and Ethical Review Board (VCWE) of the Faculty of Behavioral and Movement Sciences, Vrije Universiteit Amsterdam, VCWE-2020-159R1.[1] Online Supplementary Materials (OSM), data, and R code are available via: https://osf.io/24rzd/.

2 | METHOD

2.1 | Participants

There is no clear standard to calculate required sample size for longitudinal studies because the frequency, duration, effect size, and sample size vary across the waves (Raudenbush & Liu, 2001). Previous researchers have suggested that, as longitudinal data contains both within-subjects and between-subjects data, the error term is smaller than only between-subjects data (Keppel & Wickens, 2004); therefore, longitudinal studies require less participants than for example experiments (Ployhart & Ward, 2011). As this is a five-wave longitudinal study, we aimed for 300 participants, yielding 1500 observations. We eventually recruited a total of 376 American participants on Prolific (age ranging from 18 to 65 years old; $M = 31.66$, $SD = 10.68$). There were 203 males, 167 females and 6 others. Their educational background ranged from primary school to PhD degree.

2.2 | Procedure

We recruited 300 American participants 3 weeks before the election (Wave 1), and an additional 76, 1 week before the election (Wave 2) because attrition was higher than expected.[2] The Wave 1 data of these 76 participants were treated as missing. We used screening to only include participants who have an American nationality and hence are eligible to vote. Participants finished questions related to conspiracy mentality, and conspiracy beliefs about the elections, in each of the five waves. All questions are the same for five waves, except for subtle adjustments to be consistent with tense (see the conspiracy belief items below). Participants provided their gender, age, and education level in the first wave only. They indicated who they would vote for in the two waves before the election, and who they had voted for in the first wave (Wave 3) after the election (Biden, Trump, or Other). We asked voting choice both before and after the election, given that people could change their mind; moreover, due to attrition, not everyone participated in Wave 3. All waves lasted for 1 week, and the interval between waves was 1 week, rendering a total of 2 weeks between waves. Participants received £0.50 participant fee per wave for answering all questions within 5 min. We used delayed payment (pay at the first day of the following wave) and an increasing bonus to minimize attrition (see OSM, Table 1 for the full payment scheme).

2.3 | Measures

2.3.1 | Vote coding

A total of 36 participants were excluded from the analyses because they only finished one wave of survey. While participants had three options (Biden, Trump, Others), in our data analysis we divided participants into two groups, Biden versus Trump voters; participants who voted for "Others" were dropped from the analyses. We based participants' vote choice on their response to this issue in Wave 3. Among participants who did not finish Wave 3, we used the Wave 2 vote; if they finished neither of these two waves, we used the Wave 1 vote (more detail of vote coding in each wave, see OSM, Figures 1 and 2).

2.3.2 | Conspiracy mentality

Participants responded to the 5-item conspiracy mentality scale (Bruder et al., 2013; example item "Many important things happen in

	Vote	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5
Long format	Biden	168	206	198	197	180
	Trump	56	64	61	59	49
	Total	224	270	259	256	229
Wide format	Biden	176	210	206	197	180
	Trump	57	64	66	59	49
	Total	233	274	272	256	229

TABLE 1 Numbers of participants of each wave ($N = 300$)

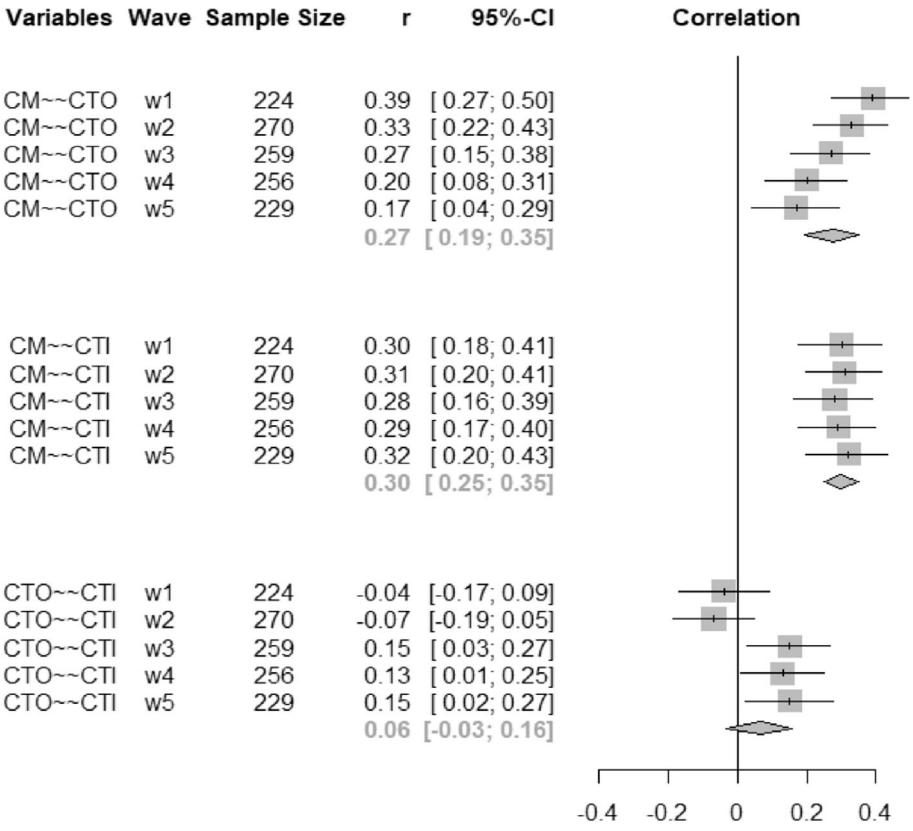

FIGURE 1 Effect sizes of the correlations between conspiracy mentality and specific conspiracy beliefs. CM, conspiracy mentality; CTO, outgroup conspiracy beliefs; CTI, ingroup conspiracy beliefs

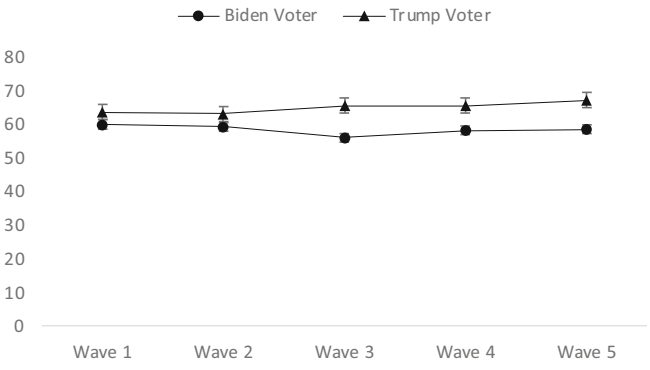

FIGURE 2 Means of conspiracy mentality of each wave

the world, which the public is never informed about"). Participants answered on a scale ranging from 0 (*Not plausible at all*) to 100 (*Very plausible*). All items were displayed in a random order. Cronbach's α of the conspiracy mentality scale for Wave 1 to Wave 5 were .82, .84, .86, .85, and .86, respectively.

2.3.3 | Specific conspiracy beliefs

Participants expressed their beliefs in Republican conspiracy theories (four items assessing whether the Republican Party conspired during the elections), and Democratic conspiracy theories (four items assessing whether the Democratic Party conspired during the elections). Republican conspiracy theories and Democratic conspiracy theories were symmetrical, for example, "The elections will be (were) rigged to favor Joe Biden", and "The elections will be (were) rigged to favor Trump".[3] Participants responded to all of these 8 items on a scale from 0 to 100 (0 = *Not plausible at all* to 100 = *Very plausible*). Outgroup conspiracy theories comprised of those four items referring to a conspiracy of the opposing group (e.g., the extent to which Biden

voters believe that Republicans rigged the elections). Cronbach's α of the outgroup conspiracy beliefs scale for Wave 1 to Wave 5 were .88, .90, .86, .87, and .85, respectively; Inversely, ingroup conspiracy theories comprised of those four items referring to a conspiracy of one's own group, for example, the extent to which Trump voters would believe in Republican conspiracy theories. Cronbach's α of the ingroup conspiracy beliefs scale for Wave 1 to Wave 5 were .90, .90, .91, .90, and .91, respectively.

2.4 | Analysis

In this study, we analyze both group-level and individual-level changes in conspiracy thinking over time. Datasets for group-level (long format) and individual-level analyses (wide format) are different, as the group-level analyses do not require participants to finish at least two waves. For the group-level analyses, we included all Biden and Trump voters who finished the online survey, however, observations in a specific wave where participants indicated to vote for "Others" were dropped.[4] We randomly inserted attention check questions (e.g., Choose a value lower than 90) in the online survey, a failed attention check would lead to exclusion of the data for this participant in a given wave. The number of participants is different across the five waves (Table 1). For the individual level analyses, we included participants who finished at least two waves, which yielded 300 participants. Among them, 229 were Biden voters and 71 were Trump voters. Their age ranged from 18 to 65 years old ($M = 31.96$, $SD = 10.74$). There were 152 males, 142 females, and 6 others.

As many participants did not finish all of the five waves, we used multiple imputation from the "Mice" package (van Buuren & Groothuis-Oudshoorn, 2011) in R to impute the missing data[5] (van Buuren & Greenacre, 2018), and generated 18 datasets (round-up the percentage of missing data). Without missing data, 300 participants generate 1500 observations; however, 262 observations (17.47%) were missing. All missing values were caused by the absence of participants in a particular wave. This absence was not likely caused by the election results, as otherwise, there would be a sharp change between Wave 2 and Wave 3. Inspections of missing data showed random missing patterns in the total sample, and in both groups of voters (see OSM, Figure 3). Longitudinal panel data differ from cross-sectional data in that each missing value can be predicted by both within-subjects (longitudinal) and between-subjects (cross-sectional) responses. In consideration of this, we employed a relatively complex missing data treatment (c.f., van Buuren & Greenacre, 2018; Study 11.2). More specifically, we created a predictor matrix based on this two-dimensional structure for each value, and used passive imputation for the mean score of each variable in each wave (for more details of this procedure, see OSM). We also conducted a longitudinal measurement invariance analysis, and found all the measurements were invariant over time (see OSM, Table 2).

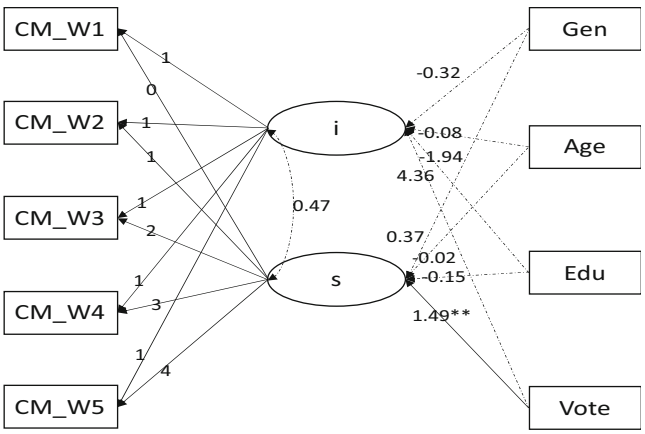

FIGURE 3 Growth curve model of conspiracy mentality

TABLE 2 Post-hoc comparisons of conspiracy mentality between waves and voter groups

	Comparison								
Type	Vote	Wave	Vote	Wave	*MD*	*SE*	*t*	*df*	p_{holm}
a	1	1	1	2	0.75	1.02	0.73	940.90	1.00
a, b	1	2	1	3	3.19	0.97	3.30	936.33	.039
a	1	3	1	4	−2.11	0.98	−2.16	936.91	.714
a	1	4	1	5	−0.26	0.99	−0.26	933.48	1.00
a	2	1	2	2	0.43	1.81	0.24	945.17	1.00
a, b	2	2	2	3	−2.48	1.76	−1.41	943.69	1.00
a	2	3	2	4	0.13	1.79	0.07	941.86	1.00
a	2	4	2	5	−1.72	1.88	−0.92	936.94	1.00
c	1	1	1	5	1.57	1.06	1.48	943.24	1.00
c	2	1	2	5	−3.64	1.96	−1.86	949.02	1.00

Note: Vote-1, participants who voted for Biden; Vote-2, participants who voted for Trump.
Note: Type-a comparison shows the changes between two connected waves; Type-b comparison shows the changes before and after election; Type-c comparison shows the total change from Wave 1 to Wave 5.

3 | RESULTS

3.1 | Correlations between conspiracy mentality and specific conspiracy beliefs

We first analyzed the correlations between conspiracy mentality and specific conspiracy beliefs, and then conducted a random-effect mini meta-analysis to examine the effect size over time (Figure 1). The correlations between conspiracy mentality and specific conspiracy beliefs were positive, and the meta-analysis showed small to medium effect sizes (the total correlation effect between conspiracy mentality and outgroup conspiracy beliefs is $r = .27$, 95% CI = [.19, .35]; the total correlation effect between conspiracy mentality and ingroup conspiracy beliefs is $r = .30$, 95% CI = [.25, .35]). The correlations between ingroup versus outgroup conspiracy beliefs were less pronounced: There were no correlation effects before the election, although after the election ingroup and outgroup conspiracy beliefs were positively correlated. The total effect of this correlation over time is not significant, $r = .06$, 95% CI = [−.03, .16].

3.2 | Conspiracy mentality

3.2.1 | Group-level change

We first conducted a linear mixed model with each participant's intercept treated as random effect in Jamovi to explore the change of each two waves among both Biden voters and Trump voters (Figure 2). Post-hoc comparisons (Table 2) showed that among the connected waves, only Biden voters' conspiracy mentality decreased ($MD = 3.19$), however, the effect size is small, and over the course of five waves, both Biden voters and Trump voters had a stable conspiracy mentality.

3.2.2 | Individual-level change

We then conducted a growth curve model analysis with the R package "Lavaan" (Rosseel, 2012). Data were the 18 datasets resulting from imputation. We tested several models (Table 3), and the model with

TABLE 3 Comparison of fit indices of conspiracy mentality latent growth curve models

Model	χ^2			RMSEA			SRMR	CFI	ΔCFI
	Value	*df*	*p*	Value	95% CI	*p*			
Intercept only models									
Ungrouped	124.36	29	<.001	.105	.086, .124	<.001	.069	.922	—
Grouped	151.50	50	<.001	.116	.095, .138	<.001	.079	.917	−.005
Intercept and linear slope									
Ungrouped	**55.28**	**22**	**<.001**	**.071**	**.048, .095**	**.066**	**.028**	**.973**	**.051**
Grouped	82.38	38	<.001	.088	.062, .114	.01	.040	.964	−.009

Note: In the comparison of CFI, the current model compared to the model above with the largest CFI. ΔCFI > .01 performs well for model comparison (Chen, 2007; Cheung & Rensvold, 2002); The retained model is in bold.

TABLE 4 Post-hoc comparisons of outgroup conspiracy beliefs between waves and voter groups

Type	Comparison				*MD*	*SE*	*t*	*df*	p_{holm}
	Vote	Wave	Vote	Wave					
a	1	1	1	2	−1.05	1.70	−0.62	946.77	1.00
a, b	1	2	1	3	21.85	1.60	13.64	941.59	<.001
a	1	3	1	4	−3.41	1.62	−2.10	942.64	.679
a	1	4	1	5	−0.06	1.65	−0.04	936.86	1.00
a	2	1	2	2	−2.03	3.00	−0.68	956.35	1.00
a, b	2	2	2	3	−15.82	2.91	−5.44	952.28	<.001
a	2	3	2	4	5.88	2.96	1.99	950.03	.804
a	2	4	2	5	−1.48	3.12	−0.48	942.82	1.00
c	1	1	1	5	17.33	1.76	9.84	953.68	<.001
c	2	1	2	5	−13.45	3.24	−4.15	962.25	.001

Note: Vote-1: participants who voted for Biden; Vote-2: participants who voted for Trump.
Note: Type-a comparison shows the changes between two connected waves; Type-b comparison shows the changes before and after election; Type-c comparison shows the total change from Wave 1 to Wave 5.

an intercept and a linear slope (Figure 3) generated the best fit, $\chi^2(22) = 55.28$, $p < .001$, RMSEA = .071 (95% CI = [.048, .095]), SRMR = .028, CFI = .973.[6] The slope is Estimate = −1.15, $SE = 1.32$, $p = .384$, indicating that conspiracy mentality does not change over time. Slope variance is Estimate = 6.99, $SE = 1.33$, $p < .001$. The intercept is Estimate = 62.89, $SE = 6.68$, $p < .001$, intercept variance is Estimate = 277.60, $SE = 29.48$, $p < .001$. The covariances between intercept and slope is Estimate = 0.47, $SE = 4.43$, $p = .916$, indicating that the start level of conspiracy mentality is not associated with the change. We controlled for gender, age, educational level and voter group, and only voter group predicted the change in conspiracy mentality, Estimate = 1.49, $SE = 0.54$, $p = .006$.

In a more exploratory fashion, we compared the differences between Biden voters and Trump voters, to examine if these two groups showed different change patterns during the election. The slope of Biden voters is Estimate = 0.85, $SE = 1.17$, $p = .469$, and the slope of Trump voters is Estimate = −1.55, $SE = 2.85$, $p = .587$, further supporting the notion that conspiracy mentality was stable during the elections among both voter groups. Taken together, these findings suggest that conspiracy mentality did not change throughout the American presidential elections. This provides empirical support for the widespread assumption that conspiracy mentality is a relatively stable individual difference variable (e.g., Bruder et al., 2013; Imhoff et al., 2022; Imhoff & Bruder, 2014).

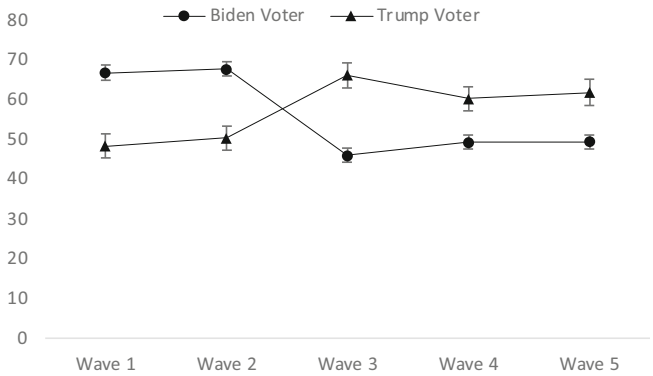

FIGURE 4 Means of outgroup conspiracy beliefs of each wave

3.3 | Specific conspiracy beliefs

3.3.1 | Group-level change of outgroup conspiracy beliefs

We then examined the trend over time of intergroup conspiracy beliefs. First, we conducted a linear mixed model analysis as we did for conspiracy mentality. Post-hoc comparison (Table 4) showed that outgroup conspiracy beliefs changed after the election for both Biden voters and Trump voters. However, the two voter groups showed contrary trends, as outgroup conspiracy beliefs were decreasing among Biden voters but increasing among Trump voters. In a longer run, from Wave 1 to 5, the same pattern was observed. These findings support our line of reasoning: Biden voters' Republican conspiracy beliefs decreased after the election, while Trump voters' Democratic conspiracy beliefs increased (Figure 4).

3.3.2 | Individual-level change of outgroup conspiracy beliefs

We then analyzed a growth curve model with the R package "Lavaan" on the 18 datasets resulting from imputation. We tested several models (Table 5), and found that the model with a quadratic curve in Waves 1 to 3, and a null-effect for Waves 3 to 5, generated the best fit (Figure 5), $\chi^2(22) = 66.78$, $p < .001$, RMSEA = .082 (95% CI = [.060, .105]), SRMR = .042, CFI = .947.[7] The RMSEA is slightly larger than the commonly used cut-off value of .08; however, Monte Carlo simulations have revealed that when models have small degrees

TABLE 5 Comparison of fit indices of outgroup conspiracy beliefs latent growth curve models

	χ^2			RMSEA					
Model	**Value**	***df***	***p***	**Value**	**95% CI**	***p***	**SRMR**	**CFI**	**ΔCFI**
Intercept only models									
Ungrouped	426.36	29	<.001	.214	.196, .232	<.001	.239	.532	—
Grouped	437.55	50	<.001	.227	.208, .247	<.001	.295	.487	−.045
Intercept and linear slope									
Ungrouped	206.34	22	<.001	.167	.147, .188	<.001	.081	.783	.251
Grouped	216.91	38	<.001	.177	.155, .200	<.001	.092	.763	−.020
Wave 1 to Wave 3 quadratic change, and Wave 3 to Wave 5 no change									
Ungrouped	**66.78**	**22**	**<.001**	**.082**	**.060, .105**	**.010**	**.042**	**.947**	**.164**
Grouped	78.01	38	<.001	.084	.057, .110	.021	.053	.947	0

Note: We also tested quadratic curve model and model with two lines; however, both were not identified. In the comparison of CFI, the current model compared to the model above with the largest CFI. ΔCFI > .01 performs well for model comparison (Chen, 2007; Cheung & Rensvold, 2002); the retained model is in bold.

of freedom, the RMSEA often falsely indicates a poor fit (Kenny et al., 2015). Given that, the SRMR and CFI both indicate a good fit; we assume that the fit of the retained model is acceptable. The slope is Estimate = −14.01, *SE* = 2.15, $p < .001$, indicating that outgroup conspiracy beliefs decreased over time. Slope variance is Estimate = 23.36, *SE* = 3.27, $p < .001$. The intercept is Estimate = 89.38, *SE* = 8.13, $p < .001$, intercept variance is Estimate = 377.36, *SE* = 46.84, $p < .001$. The covariances between intercept and slope is Estimate = −18.07, *SE* = 9.76, $p = .065$, indicating that the start level of outgroup conspiracy beliefs is not associated with the change. We controlled for gender, age, educational level and voter group, and found that voter group had an effect on both the slope (Estimate = 8.05, *SE* = 0.87, $p < .001$) and intercept (Estimate = −20.81, *SE* = 3.30, $p < .001$) of outgroup conspiracy beliefs.

We further checked for differences between the two voter groups. Among Biden voters, the slope is Estimate = −6.53, *SE* = 2.02, $p = .001$, the intercept is Estimate = 67.13, *SE* = 7.57, $p < .001$, the covariance is Estimate = −8.48, *SE* = 10.41, $p = .416$. Among Trump voters, the slope is Estimate = 3.20, *SE* = 4.29, $p = .455$, the intercept is Estimate = 51.92, *SE* = 16.87, $p = .002$, the covariance is Estimate = −51.10, *SE* = 24.20, $p = .035$. Taken together, these results indicate that Biden voters' outgroup conspiracy beliefs decreased during the election, while Trump voters' outgroup conspiracy beliefs did not change. At Wave 1, Biden voters scored higher on outgroup conspiracy beliefs than Trump voters. The covariances between slopes and intercepts indicate that a high level of outgroup conspiracy beliefs at the first measurement was associated with a slow increase over time among Trump voters, however, this association does not exist among Biden voters.

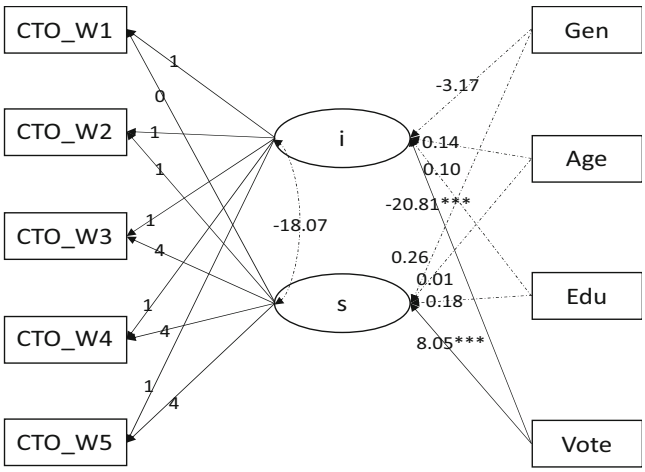

FIGURE 5 Growth curve model of outgroup conspiracy beliefs

3.3.3 | Group-level changes of ingroup conspiracy beliefs

We then explored the results for ingroup conspiracy beliefs: To what extent did Trump voters suspect the Republican Party and Biden

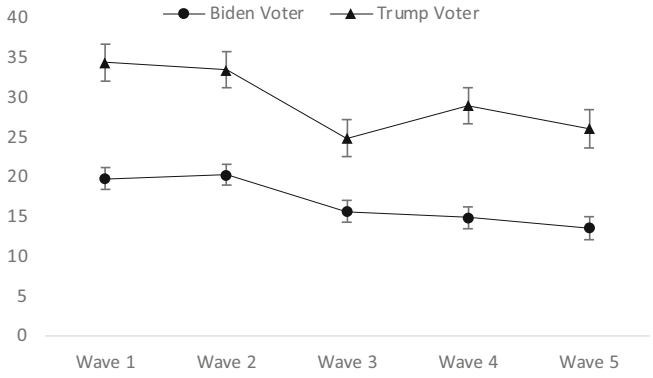

FIGURE 6 Means of ingroup conspiracy beliefs of each wave

	Comparison								
Type	Vote	Wave	Vote	Wave	*MD*	*SE*	*t*	*df*	p_{holm}
a	1	1	1	2	−0.50	1.12	−0.45	943.11	1.00
a, b	1	2	1	3	4.61	1.05	4.38	937.65	<.001
a	1	3	1	4	0.83	1.07	0.77	938.35	1.00
a	1	4	1	5	1.27	1.08	1.17	934.32	1.00
a	2	1	2	2	0.88	1.98	0.44	948.01	1.00
a, b	2	2	2	3	8.62	1.91	4.50	945.93	<.001
a	2	3	2	4	−4.10	1.95	−2.11	943.99	.355
a	2	4	2	5	2.86	2.05	1.39	938.41	.984
c	1	1	1	5	6.21	1.16	5.36	945.84	<.001
c	2	1	2	5	8.26	2.13	3.87	952.34	.002

TABLE 6 Post-hoc comparisons of ingroup conspiracy beliefs between waves and voter groups

Note: Vote-1: participants who voted for Biden; Vote-2: participants who voted for Trump.
Note: Type-a comparison shows the changes between two connected waves; Type-b comparison shows the changes before and after election; Type-c comparison shows the total change from Wave 1 to Wave 5.

TABLE 7 Comparison of fit indices of ingroup conspiracy beliefs latent growth curve models

Model	χ^2 Value	*df*	*p*	RMSEA Value	95% CI	*p*	SRMR	CFI	ΔCFI
Intercept only models									
Ungrouped	146.83	29	<.001	.116	.098, .135	<.001	.065	.863	—
Grouped	161.19	50	<.001	.122	.101, .143	<.001	.075	.868	.005
Intercept and linear slope									
Ungrouped	**60.44**	**22**	**<.001**	**.076**	**.054, .100**	**.029**	**.046**	**.955**	**.087**
Grouped	70.12	38	.001	.075	.047, .102	.070	.051	.962	.007

Note: In the comparison of CFI, the current model compared to the model above with the largest CFI. ΔCFI > .01 performs well for model comparison (Chen, 2007; Cheung & Rensvold, 2002); the retained model is in bold.

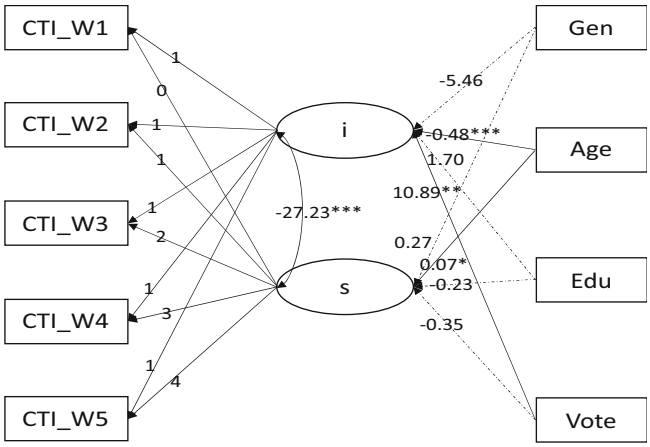

FIGURE 7 Growth curve model of ingroup conspiracy beliefs

voters suspect the Democratic Party, of rigging the elections? Again, we conducted a linear mixed model analysis. Post-hoc comparison (Table 6) showed that ingroup conspiracy beliefs decreased after the election for both Biden voters and Trump voters. In a longer run, from Wave 1 to 5, the same pattern was observed, suggesting that both Biden voters' Democratic conspiracy beliefs, and Trump voters' Republican conspiracy beliefs, decreased significantly after the election (Figure 6).

3.3.4 | Individual-level change of ingroup conspiracy beliefs

We analyzed the growth curve model with the R package "Lavaan" (Rosseel, 2012). Data were the 18 datasets resulting from imputation. We tested several models (Table 7), and found that the model with an intercept and a linear slope (Figure 7) generated the best fit, $\chi^2(22) = 60.44$, $p < .001$, RMSEA = .076 (95% CI = [.054, .100]), SRMR = .046, CFI = .955.[8] The slope is Estimate = −3.46, *SE* = 1.57, $p = .028$, indicating that ingroup conspiracy beliefs decreased over time. Slope variance is Estimate = 6.84, *SE* = 1.81, $p < .001$. The intercept is Estimate = 31.39, *SE* = 8.73, $p < .001$, intercept variance is Estimate = 381.70, *SE* = 49.05, $p < .001$. The covariances between intercept and slope is Estimate = −27.23, *SE* = 7.89, $p = .001$, suggesting that ingroup conspiracy beliefs decrease faster over time for those who had a higher base-rate level at the first measurement.

Again, we controlled for gender, age, educational level, and voter group. Voter group had an effect on the intercept of ingroup conspiracy beliefs, Estimate = 10.89, *SE* = 3.54, $p = .002$, indicating that Trump voters had a higher level of ingroup conspiracy beliefs than Biden voters at the first measurement. In addition, age had effects on both the intercept (Estimate = −0.48, *SE* = 0.14, $p = .001$) and slope (Estimate = 0.07, *SE* = 0.03, $p = .012$), suggesting that although younger people scored higher than older people at the first measurement, their ingroup conspiracy beliefs also decreased faster over time.

These findings suggest that both voter groups' ingroup conspiracy beliefs decreased over time. Trump voters started with higher levels of ingroup conspiracy beliefs than Biden voters and age moderated the trend over time. Furthermore, ingroup conspiracy beliefs decreased faster among those who started at a relatively high level, which mostly were Trump voters.

4 | DISCUSSION

This five-wave longitudinal study revealed that general conspiracy mentality was stable during the course of the American presidential elections across voter groups. Meanwhile, intergroup conspiracy beliefs changed over time as a result of the election outcome. The outgroup conspiracy beliefs of election winners, who voted for Joe Biden, decreased between the pre- and post-election waves; outgroup conspiracy beliefs of election losers, who voted for Trump, increased between the pre- and post-election waves (in terms of group-level change). These findings support Uscinski and Parent's (2014) notion that conspiracy theories are especially common among election losers. In addition, ingroup conspiracy beliefs decreased over time across voters. While research has mainly focused on outgroup conspiracy theories (Cichocka et al., 2016; Jolley et al., 2020; Sapountzis & Condor, 2013; van Prooijen & Song, 2021), ingroup conspiracy beliefs may be a meaningful area of research as well.

Most studies on conspiracy beliefs provide correlational evidence through cross-sectional designs (van Prooijen & Douglas, 2018). The present research took full advantage of the 2020 American presidential elections through a five-wave longitudinal design, enabling three complementary contributions. First, the results provide evidence that conspiracy mentality is a relatively stable individual difference trait (Bruder et al., 2013; Imhoff & Bruder, 2014): While the election did influence specific conspiracy beliefs (i.e., that the elections were rigged), it did not influence conspiracy mentality. Second, the results provide evidence for the notion that conspiracy beliefs are for election losers (Uscinski & Parent, 2014), as reflected in the finding that Biden voters' outgroup conspiracy beliefs decreased at the individual level, while Trump voters' did not. The group-level effects on changes in outgroup conspiracy beliefs also underscored the role of intergroup conflict in conspiracy theories (van Prooijen & Song, 2021). And third, the present research examined conspiracy theories about one's own political ingroup, and found that such ingroup conspiracy beliefs decreased over time.

The decrease over time for ingroup conspiracy beliefs occurred among both Biden and Trump voters. We speculate that, given its polarized nature and contested result, this election increased intergroup conflict between Biden and Trump voters. Such intergroup conflict may have increased feelings of ingroup loyalty within both voter groups (Druckman, 1994), therefore decreasing beliefs that members of one's own group were conspiring. Moreover, ingroup conspiracy beliefs were higher for Trump than Biden voters (particularly at the first measurement point). This difference might expand previous findings that Republicans are more susceptible to conspiracy cues than Democrats (Enders & Smallpage, 2019), by suggesting that these effects generalize to conspiracy cues coming from their own ingroup.

This longitudinal study offers both between-subjects information (different voters) and within-subjects information (individual changes over time). Collective levels of conspiracy mentality and specific conspiracy beliefs are relevant for policy makers because they predict a wide range of social problems (van Prooijen et al., 2022). Meanwhile, the dissociation between the trends of conspiracy mentality versus specific conspiracy beliefs over time may provoke new research from psychologists, that for example examines if there are differences between the cognitive processes underlying conspiracy mentality and specific conspiracy beliefs. In particular, it is possible that conspiracy mentality mostly is a cognitive style, while specific conspiracy beliefs depend mostly on the circumstances. Further research examining these psychological processes may lead to a more fine-grained understanding of why people believe in conspiracy theories.

The mini meta-analysis on correlations between conspiracy mentality and specific conspiracy beliefs indicates that conspiracy mentality predicts belief in both ingroup and outgroup conspiracy theories, however, the correlation between ingroup versus outgroup conspiracy beliefs may differ across situations. Our results more specifically revealed that this correlation was not significant before the election, but it was significant after the election. At present it is yet unclear why that is the case. Future research examining the similarities and differences of ingroup versus outgroup conspiracy beliefs may increase understanding of what role group affiliations play in forming conspiracy beliefs.

4.1 | Strengths and limitations

This study has a number of noteworthy strengths. It applied a longitudinal measurement design to track conspiracy beliefs during a highly contentious and impactful societal event as it unfolded. This is a substantial methodological improvement over studies that asked for conspiracy theories only after impactful societal event had occurred, and allows for an improved understanding of how conspiracy theories develop over time. Furthermore, this study was tied to a highly impactful historical event (the 2020 American presidential election). While on the one hand this focus underscores the present findings' ecological validity and societal relevance, we should also acknowledge that it is unclear whether these findings generalize to different settings (e.g., election events in other countries with a different political system).

Methodologically, growth curve models provide insights into possible within-individual differences across waves, which is crucial for understanding how conspiracy beliefs develop over time. More specifically, growth curve models test trends of variables at the individual level. This makes growth curve models superior to for instance repeated measures ANOVA, which ignores these individual-level developments over time and only focuses on mean comparisons (Rovine & McDermott, 2018).

The study also has its share of limitations. First, the sample was not large, and not nationally representative for the American electorate. Indeed, our sample contained more Biden voters than Trump or "Other" voters. Due to these sampling limitations, we did not analyze how conspiracy beliefs changed among participants who voted neither for Biden nor Trump. However, this group could be interesting as they are also losers in the election, which has implications for their specific conspiracy beliefs over time. Furthermore, although political attitudes can change substantially during elections (Zwicker et al., 2020), in retrospect it would have been better to collect more waves, also given that the Capitol Hill riots happened only a few weeks after our last measurement point. As even personality, traits can change over time, at present we cannot exclude the possibility that conspiracy mentality does change but at a much slower pace than specific conspiracy beliefs. This suggests that more longitudinal research, over a longer time period, is needed.

It also should be acknowledged that we used future tense for specific conspiracy beliefs before the election (e.g., "The elections will be rigged to favor Joe Biden"), and past tense after the election (e.g., "The elections were rigged to favor Joe Biden"). The wording of questions hence necessarily was not entirely the same, given that the first refers to suspected conspiracies before the fact, and the second refers to the perception of conspiracies after the fact. Note, however, that this inevitable wording difference did not because measurement variance, as the longitudinal measurement invariance analysis showed no significant influence of these wording differences.

5 | CONCLUSION

The 2020 American presidential elections yielded many conspiracy beliefs that the elections were rigged, and conspiracy beliefs generally have negative consequences for societies. One key challenge for scientists and policymakers is to establish how conspiracy theories develop over time. In this research, we conducted a longitudinal study to provide empirical insights into the temporal dynamics underlying conspiracy beliefs, in the setting of a polarized election. We conclude that specific conspiracy beliefs that the elections were rigged—but not conspiracy mentality—are malleable over time, depending on political affiliations and election results.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

All data and R-code necessary to reproduce the current results are available at https://osf.io/24rzd/.

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ENDNOTES

[1] While this study is a part of a bigger project preregistered on OSF, https://osf.io/4qzxr, the analyses reported here were not preregistered; the results for the preregistered hypotheses (including additional measures of feelings of uncontrollability and political extremism) make a substantially different contribution, and therefore will be reported in a different paper.

[2] We recruited 300 participants in Wave 1 based on Prolific's expected attrition of <25% over 1 year. But in Wave 2, we had only around 2/3 of participants that had finished the survey after 4 days (duration 7 days). To ensure having enough observations, we recruited another 76 participants in Wave 2.

[3] The other three Democratic conspiracy theories are: "High-ranked officials conspire to give the Democrats an unfair advantage during the elections", "The Democratic party is (was) committing fraud in the elections", and "The Democratic Party is (was) suppressing voting among Republicans". The other three Republican conspiracy theories are: "High-ranked officials conspire to give the Republicans an unfair advantage during the elections", "The Republican party is (was) committing fraud in the elections", and "The Republican Party is (was) suppressing voting among Democrats".

[4] Participants may have indicated that they would vote for "Others" in Wave 1 or Wave 2 but finally voted for Biden or Trump. In this situation, we keep the participants but only drop their answers if they opted for "Others" in this specific wave.

[5] We only used missing data imputation in the latent growth curve model analysis. In longitudinal research, it is common to lose participants especially when the study has many waves. Deleting all data from one participant for missing only one wave—while four waves of data were recorded—is not considered good practice, yielding data imputation methods necessary. Likelihood-based methods are considered the "royal way" to deal with missing data, and multiple imputation (MI) extends the likelihood methods by making the models easier to analyze. More importantly, multiple imputation makes it possible to inspect the imputed data (van Buuren & Greenacre, 2018). As a robustness check, we also report model fits with missing data imputed by full information maximum likelihood (FIML).

[6] The fit of FIML imputed missing data is $\chi^2(22) = 64.878$, $p < .001$, RMSEA = .081, SRMR = .034, CFI = .963, indicate that MI imputed missing data fitted the model slightly better, ΔCFI = .01.

[7] The fit of FIML imputed missing data is $\chi^2(22) = 67.077$, $p < .001$, RMSEA = .083, SRMR = .041, CFI = .947, showing no difference between these two imputation methods, ΔCFI = 0.

[8] The fit of FIML imputed missing data is $\chi^2(22) = 78.122$, $p < .001$, RMSEA = .084, SRMR = .050, CFI = .957, suggesting that the MI imputed missing data fitted this model slightly better with a RMSEA smaller than the cut-off value.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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