


When there is No ZOPA: Mental Fatigue, Integrative Complexity, and Creative Agreement in Negotiations

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Abstract

How to reach a creative agreement in negotiations when the Zone of Possible Agreement (ZOPA) does not apparently exist? To answer this question, we drew on the cognitive flexibility theory and proposed a model predicting that negotiators' mental fatigue would engender fewer creative agreements, and their integrative complexity acted as an underlying mechanism. Across four studies, we measured (Study 1) and manipulated (Studies 2–4) mental fatigue to test our hypotheses. We found that negotiation dyads with higher mental fatigue were less likely to display integrative complexity and hence less likely to reach creative agreements in negotiations without an apparent ZOPA. We also demonstrated that in this kind of negotiation, simply identifying additional issues or proposing packaging offers were not enough; negotiators need to do both to construct creative agreements. This research contributes to the literature of negotiation, creative problem-solving, and the cognitive flexibility theory.

Introduction

Negotiators may encounter situations when there is no apparent Zone of Possible Agreement (ZOPA), which is an overlapped range constituted by the two parties' resistance points (Raiffa, 1982; Thompson, Wang, & Gunia, 2010). For instance, in deal-making negotiations, the sellers' presumed bottom line may still outweigh the buyers' best offer in terms of the price. This may lead to three potential outcomes. First, some negotiators accept a no-deal, which is economically wise yet psychologically bothersome (O'Connor & Arnold, 2001; Thompson, 1998). Second, some negotiators ignore their resistance points and reach an otherwise economically worse off agreement (Cohen, Leonardelli, & Thompson, 2014; Tuncel, Mislin, Kesebir, & Pinkley, 2016). Third, some negotiators reach a creative agreement, which is a solution compromises negotiators' presumed resistance points but fulfills their underlying interests with additional terms (Anderson & Thompson, 2004; De Dreu, Beersma, Stroebe, & Euwema, 2006; Sinaceur, Maddux, Vasiljevic, Perez Nüchel, & Galinsky, 2013).

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Both laboratory studies and real-world cases suggest that creative agreements widely exist, helping negotiators create values (Kray & Haselhuhn, 2007), resolve conflicts (Deutsch, Coleman, & Marcus, 2011), and establish rapport (Goldberg, 2005). However, little is known in the literature about what contributes to and how to reach creative agreements. As a real-world example, the Good Friday Agreement did not resolve the geographic dispute between the U.K. and Ireland over Northern Ireland due to the two countries' presumed resistance points, but it addressed both parties' underlying concerns by creating a form of co-sovereignty that allowed people in Northern Ireland to identify as British, Irish, or both (Cox, Guelke, & Stephen, 2006). Some previous theoretical work (Kesting & Smolinski, 2007; Thompson & Leonardelli, 2004) have explored the importance of creative agreement, but empirical studies of its contributing factors remain limited.

Cognitive flexibility theory offers new insights into understanding the antecedents of creative agreement. It suggests the importance of mental efforts in comprehending information in complex tasks (Spiro, Feltovich, Jacobson, & Coulson, 1992; Spiro & Jengh, 1990) because "solving problems creatively requires extensive and effortful cognitive processing" (Reiter-Palmon & Illies, 2004, p. 55). Mental fatigue is "the feeling that people experience after or during prolonged periods of cognitive activity (Boksem & Tops, 2008, p. 126), so examining the role of mental fatigue would shed light on how negotiators' mental efforts contribute to the process and outcome of their creative problem-solving. Negotiations without an apparent ZOPA present a salient context to examine whether and how mental fatigue affects the likelihood of negotiators reaching a creative agreement.

It is theoretically meaningful to study creative agreement by examining how negotiators look beyond the resistant points when ZOPA does not seemingly exist in a distributive negotiation. In this kind of negotiations, we predict differences between mentally fatigued and mentally energetic negotiators in terms of how they process information, conceive proposals, and generate creative agreements. Specifically, we hypothesized that mentally fatigued negotiators are less likely to reach creative agreements and that integrative complexity serves as the underlying mechanism. Integrative complexity is the degree to which people perceive different perspectives in considering an issue (differentiation) and develop conceptual connections among those differentiated perspectives (integration; Baker-Brown et al., 1992). This psychological process captures the structure or style of one's thinking rather than the substance of it. Across four empirical studies, we used measurement (Study 1) and experiments with different designs (Studies 2–4) to test our hypotheses and also conducted supplementary analyses to shed light on the nature of creative agreement.

This research intends to make three contributions to the literature. First, it enriches our understanding of negotiations without apparent ZOPA by investigating creative agreement as an important yet understudied outcome. Previous studies on this type of negotiations generally focus on explaining why and when people feel obligated to reach agreements as a form of cognitive bias (Cohen et al., 2014; Thompson & Leonardelli, 2004; Tuncel et al., 2016), but we shift the focus to why and how negotiators overcome this bias when it is possible yet unobvious. Our effort reflects practice in real-world negotiations (Fisher & Ury, 1991; Malhotra, 2016).

Second, this research contributes to the creativity literature by examining integrative complexity as the mechanism and revealing the process of creative problem-solving in interdependent social interactions. Although scholars have widely acknowledged that negotiation requires people to "think outside the box," very few studies empirically examined creativity in negotiations (Kung & Chao, 2019; Ott, Prowse, Fells, & Rogers, 2016; Sharma, Bottom, & Elfenbein, 2013). We showed that integrative complexity, as a cognitive style consisting of differentiation and integration sequentially, explained the emergence of creative agreements in negotiations.

Third, this research extends the application of the cognitive flexibility theory from education psychology (Spiro et al., 1992; Spiro & Jengh, 1990) to the domain of social interactions. Our examination in the negotiation context suggests that the theory can be applied in the context of problem-solving beyond knowledge acquisition, and the multiple representations of the content suggested by the theory can be

conceptualized as using multiple dimensions to reframe a problem rather than using multiple technologies to demonstrate a problem. These two extensions open new research avenues for the cognitive flexibility theory.

Literature Review and Hypothesis Development

Mental Fatigue and Creative Agreement

Creative agreement is a crucial yet understudied negotiation outcome (Tripp & Sondak, 1992). Creative agreement is more than just an agreement. Previous studies of negotiation agreement have examined the antecedents of agreement versus impasse as the negotiation outcome, such as power (Anderson & Thompson, 2004), strategies (Brett & Okumura, 1998), social and epistemic motives (Liu, Chua, & Stahl, 2010; Weingart, Bennett, & Brett, 1993), and communication and conversation contents (Brett, Olekalns, Friedman, Goates, Anderson, & Lisco, 2007; Liu, Friedman, Barry, Gelfand, & Zhang, 2012). Those studies extend our knowledge of the driving factors of agreement versus impasse, but they have a premise in their theory and methodology that given information constitutes an apparent ZOPA. Therefore, previous studies focus more on how individual and contextual factors contribute to the process during which negotiators share information, identify trade-offs, and generate a mutually satisfactory agreement within the given ZOPA (Thompson et al., 2010).

However, in negotiations without an apparent ZOPA, it is problematic to solely focus on the agreement–impasse dichotomy (Sebenius, 1992). An agreement may imply negotiators' compromise of each other's priorities, while an impasse may suggest a loss of opportunities in discovering hidden settlements. Both outcomes may lead to suboptimal solutions. In contrast, a creative agreement goes beyond the conflict of the two parties' presumed resistance points to identify additional terms that fulfill both parties' underlying interests (Sebenius, 2007). Therefore, some scholars begin to focus on problem-solving that leads to creative agreement, both theoretically (Kesting & Smolinski, 2007) and empirically (Sinaceur et al., 2013). For example, proposing first offer later rather than sooner would facilitate information exchange and creative agreement generation (Sinaceur et al., 2013). These studies provide insightful evidence that negotiators' cognitive style about how to identify additional information is the key to producing creative agreements.

Cognitive flexibility theory, first introduced in education psychology, highlights the importance of cognitive flexibility in comprehending information in unconventional situations (Spiro & Jengh, 1990). It argues that people need to adopt different perspectives rather than an oversimplified approach to solving nonroutine tasks (Spiro et al., 1992), such as in negotiations without an apparent ZOPA. Previous studies apply this theory to broader settings, showing that being cognitively flexible can facilitate creative problem-solving (De Dreu, Baas, & Nijstad, 2008). Being cognitively flexible requires substantial mental energy to facilitate the process of reaching creative agreements. Negotiations without an apparent ZOPA are a typically unconventional, nonroutine situation that requires substantial mental energy.

Mental fatigue is the lack of mental energy, signaling mental rigidity rather than flexibility, and it has been shown to associate with impaired cognitive and behavioral performance for two interrelated reasons. First, it impairs people's cognitive capacity such as attention, action monitoring, and systematic strategy development when facing a complex problem (Boksem, Meijman, & Lorist, 2006). Second, mental fatigue increases energy costs, diminishes the desirability of expected outcomes of the task, and reduces people's motivation to invest more cognitive energy (Chaudhuri & Behan, 2000). In short, mental fatigue both hinders cognitive information processing and weakens motivational willpower (Boksem & Tops, 2008). Mental fatigue weakens both trait-like need for cognition, which is the tendency to engage in and enjoy effortful cognitive endeavors, and state-like epistemic motivation, which is the motivation to hold accurate perceptions of the world (Webster, Richter, & Kruglanski, 1996). Both need for

cognition and epistemic motivation have been shown to link to creativity in general and value-creating in negotiation (De Dreu, et al., 2006; Wu, Parker, & De Jong, 2014).

Applying this theorizing into the negotiation context, we predict that mental fatigue would undermine the likelihood of creative agreement. Negotiation without an apparent ZOPA poses cognitive challenges to negotiators since they have to consume more mental energy and maintain stronger motivations to process complex information (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001). We propose that mentally fatigued negotiators would experience greater difficulty in reexamining their decision-making process, drawing factual or counterfactual thinking, and retaining strong motivations (Boksem & Tops, 2008). As a result, mental fatigue would impair negotiators' problem-solving capacities and motivations in the course of negotiation, and thus decrease the likelihood of reaching a creative agreement.

Hypothesis 1. Negotiators with higher degrees of mental fatigue are less likely to reach creative agreements.

Integrative Complexity as a Mediator

Why mentally fatigued negotiators are less likely to come up with a creative solution in distributive negotiations without apparent ZOPA? The cognitive flexibility theory suggests that negotiators' integrative complexity explains the reason. In order to process information in complex domains, people need to be cognitively flexible (Spiro et al., 1992). According to Spiro and Jengh (1990), cognitive flexibility encompasses both the way knowledge is represented (i.e., in multiple rather than single conceptual dimensions) and how those mental representations operate (i.e., schema assembly rather than simple schema retrieval). This statement reveals two essential components of cognitive flexibility: representing information in multiple dimensions and then assembling them together.

Integrative complexity precisely taps the two components because it by definition consists of information differentiation and integration. Integrative complexity is broadly understood as the "the capacity and willingness to acknowledge the legitimacy of competing perspectives on the same issue (differentiation) and to forge conceptual links among these perspectives (integration)" (Tadmor, Galinsky, & Maddux, 2012, p. 522). Tadmor et al. (2012) highlight that it describes the structure or style of one's thinking rather than the content of the thought. Thus, differentiation explores divergent thinking that evaluates an issue from different perspectives, whereas integration instigates convergent thinking that synthesizes conceptual links among these perspectives (Charlton & Bakan, 1989). This theorizing is consistent with Walton's (1969) Differentiation-before-Integration model which suggests the importance of sufficient differentiation first and systematic integration second in conflict resolution.

We propose that integrative complexity is a core process of creative problem-solving in negotiations without an apparent ZOPA. As argued before, mental fatigue would impair negotiators' capacity and willingness to execute cognitively arduous tasks, so we predict a negative relationship between mental fatigue and integrative complexity. In contrast, mentally energetic negotiators are more likely to adopt integrative complexity in the course of the negotiation. Due to the lack of a ZOPA, negotiators often struggle with the seemingly unresolvable conflict anchored by the two parties' resistance points. By engaging in integrative complexity, negotiators can look beyond these resistant points, identify alternative perspectives, and reevaluate multiple dimensions of the key issue. Kray, Galinsky, and Markman (2009) found that additive counterfactual thinking (i.e., "If only I had") would be more likely to generate creative agreements than subtractive counterfactuals thinking (i.e., "If only I had not"). The differentiation component resembles the nature of additive counterfactual thinking because it adds paradoxical perspectives to the seemingly unresolvable conflict (Miron-Spektor, Gino, & Argote, 2011). The integration component allows negotiators to reach

an agreement that integrates those differentiated, paradoxical perspectives (Wilson & Thompson, 2014). As Lax and Sebenius (1986, p. 31) suggested, negotiators “may succeed by putting familiar pieces of the problem together in ways that people had not previously seen.” In sum, although mental fatigue leads to less creative agreement, such negative relationship can be mitigated by introducing integrative complexity. On the other hand, mentally energetic negotiators are more likely to display integrative complexity by differentiating and integrating perspectives and dimensions of the core problem, thereby formulating a creative settlement.

Hypothesis 2. Integrative complexity mediates the relationship between negotiators’ mental fatigue and the likelihood of reaching creative agreements.

Overview of Four Studies

We conduct four studies to test our hypotheses and extend our understanding of creative agreement in negotiations without apparent ZOPA. Mental fatigue was measured in Study 1 and manipulated with different approaches across Studies 2–4. We tested the main effect of mental fatigue (H1) in all four studies and the mediating effect of integrative complexity (H2) in Studies 3 and 4. The negotiation exercises in all studies were deal-making buyer–seller negotiations without apparent ZOPA: the buyers’ resistance points, which were prescribed as the maximum authorized price to offer by the company, were lower than the sellers’ resistance points, which were prescribed as the minimum price to achieve their goal by aggregating various interests. In all negotiation instructions, participants were simply informed that their purpose was trying to reach an agreement that they felt satisfactory. They were neither cued to particularly come up with creative solutions nor reminded to stick to the given resistance points. Because creative agreement was a dyad-level construct, we performed analyses at the dyad level in all studies.

Study 1

Participants and Procedures

Participants were 68 undergraduate students enrolled in a course on social psychology in a university in China. Their mean age was 18.76 years ($SD = 1.99$), and 58.9% were women. Participants were randomly assigned to the role of either a buyer or a seller in the negotiation of buying and selling a restaurant. This exercise had no apparent ZOPA according to the prescribed reservation prices to buyers (i.e., ¥ 3 million) and sellers (i.e., ¥ 3.3 million). We gave participants 15 min to prepare and 20 min to negotiate. When the time was up, they reported their results immediately and completed a postnegotiation survey independently.

Measures

Creative Agreement

It was assessed as a dichotomous variable following an established coding scheme (Galinsky, Magee, Gruenfeld, Whitson, & Liljenquist, 2008; Sinaceur et al., 2013). An outcome was a creative agreement (coded as 1) if participants reached an agreement with a price number and also included additional terms that add values to fulfill their interests. For example, participants might have included a future employment contract as an additional issue, which allows the sellers to serve their underlying interests even though the agreement price number goes beyond the sellers’ presumed resistance point. An outcome was not considered as a creative agreement (coded as 0) if it was an impasse or if the agreement included only a

sales price number. Two coders agreed on 32 dyads (Cohen's $\kappa = .88$) and achieved consensus on the remaining two dyads through a discussion.

Mental Fatigue

Each participant completed a postnegotiation survey individually. In this survey, we used the five-item scale developed by Shirom and Melamed (2006) to measure mental fatigue by asking how they felt about themselves during the negotiation: (1) My thinking process is slow, (2) I have difficulty concentrating, (3) I feel as if I'm not thinking clearly, (4) I feel that I'm not focused in my thinking, and (5) I have difficulty thinking about complex things. First, all five items were measured using a six-point Likert scale (1 = *strongly disagree* to 6 = *strongly agree*) at the individual level ($\alpha = .87$). Second, based on the theorizing of negotiation processes' reciprocal and interdependent nature (Turel, 2010), we aggregated mental fatigue to the dyad level for subsequent analysis. Results justified this aggregation because $Rwg = 0.93$ and over 94% of dyads had a score of $Rwg > 0.80$.

Results and Discussion

H1 predicted that negotiators' mental fatigue leads to less creative agreements. Among the 34 dyads, 16 reached a creative agreement, while 18 did not. The correlation analysis showed that negotiation dyads' mental fatigue was negatively associated with creative agreement ($r = -.42, p = .013$). The logistic regression that controlled for the negotiation duration (Stuhlmacher & Champagne, 2000) showed that dyads reporting higher mental fatigue were less likely to reach a creative agreement ($B = -2.08, SE = 1.01, OR = 8.02, p = .039$). Thus, H1 was supported.

Study 1 provided very rudimentary yet important evidence for supporting H1. We found that negotiators who reported a higher level of mental fatigue were less likely to reach a creative agreement. This effect remained significant when we controlled for how long the negotiation lasted. Because no particular instruction was given to the participants on generating creative solutions, the fact that some dyads spontaneously reached creative agreements implied that this is a relevant phenomenon in negotiations. However, we were unable to draw causal inference from the finding because mental fatigue was measured in the postnegotiation survey and negotiation outcomes may contaminate how participants reported their mental fatigue, although we explicitly asked the participants to report how they felt during the negotiations. To address this limitation, we conducted an experiment in Study 2.

Study 2

Participants and Procedures

One hundred and four postgraduate students who took an introductory class on negotiation at a business school in France participated in this study. The participants were from ten different countries, mainly in Europe, Africa, and Asia. They were enrolled in four different groups in the same class taught by the same instructor: 28 in group 1, 26 in group 2, 28 in group 3, and 22 in group 4. The four groups were taught at four different points in time from 2015 to 2017. Their mean age was 22.79 years ($SD = 1.72$), and 53.4% were women.

All participants were randomly assigned as either a buyer or a seller to negotiate the sale of a property in France. The reservation price for the buyer was € 945 thousand, while the reservation price for the seller was € 1.02 million. Before they started negotiating, some of the participants answered five questions as the manipulation check. They prepared for 20 min and negotiated for 50 min, and then they submitted a contract to report the outcome.

Manipulation and Measure

Creative Agreement

It was measured the same way as it was in Study 1 (Cohen’s $\kappa = .91$).

Mental Fatigue

We manipulated mental fatigue by asking the four groups of students to conduct their negotiation at different time points. Nordgren, McDonnell, and Loewenstein (2011) show that students were significantly more fatigued at the end of the class than at the beginning of it. In the present study, the class session was from 8:10 AM to 12:30 PM. Participants in groups 1 and 3 (56 participants) were assigned into the mental fatigue condition, and they negotiated from 11:40 AM to 12:30 PM; participants in groups 2 and 4 (48 participants) were assigned into the mental energy condition, and they negotiated from 8:40 AM to 9:30 AM. Due to an accessibility issue, only around half of the participants (groups 3 and 4) answered manipulation check questions, which was the mental fatigue measure used in Study 1 ($\alpha = .84$).

Results and Discussion

Results of the manipulation check based on 50 participants showed that participants in group 3 (mental fatigue condition: $M = 3.34, SD = 0.84$) reported a higher level of mental fatigue than participants in group 4 (mental energy condition: $M = 2.80, SD = 0.98$), $F(1, 48) = 4.32, p = .043$. In the hypothesis testing based on all 52 dyads (104 participants), we found that in the mental energy condition, 20 out of the 24 dyads reached creative agreements; in the mental fatigue condition, 15 out of the 28 dyads did so. The Chi-square test result, $\chi^2(1, 52) = 5.20$, Cramér’s Phi = .31, $p = .023$, supported H1. The results are displayed in Figure 1.

Study 2 replicated the finding in Study 1. We found that participants negotiating at the beginning of the class with a higher level of mental energy were more likely to reach creative agreements than did those who were mentally fatigued after a three-hour class. We can draw causal inference from the finding, but the study had two limitations. First, we did not include manipulation check questions for all participants, although half of the sample showed the effectiveness of the manipulation and there was no significant difference in demographic characteristics among all participants. Second, our manipulation might cause an alternative explanation because taking a lengthy class could also yield physical

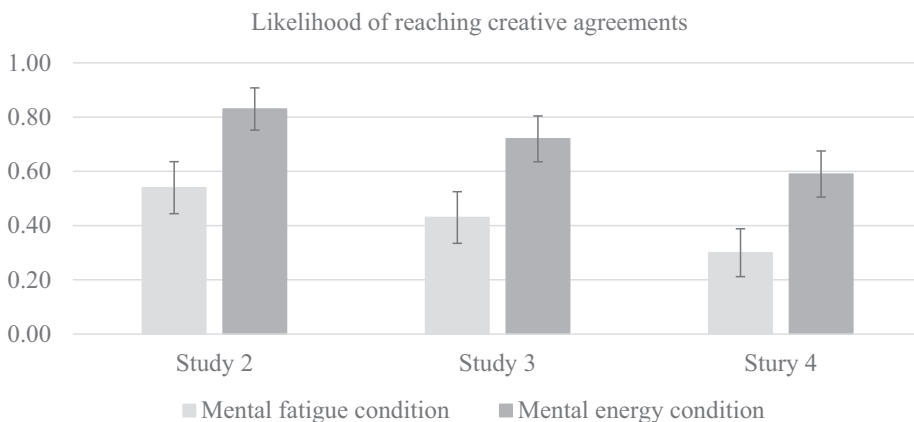


Figure 1. Mental fatigue and likelihood of reaching creative agreements.

exhaustion. To address these limitations as well as further examine the underlying mechanism, we conducted Study 3.

Study 3

Participants and Procedures

We recruited 114 Chinese undergraduate students to participate in Study 3. Their mean age was 20.62 years ($SD = 2.28$), and 58.8% were women. Following the researchers' instructions, all participants arrived at the same time. First, participants received the manipulation materials by looking at two pictures and completing a writing task independently, followed by manipulation check questions. Next, they were randomly assigned a role as either a buyer or a seller and then read the negotiation materials, prepared, and negotiated the Texoil simulation (Goldberg, 2000) with a counterpart with the opposite role but in the same manipulation condition. The only modification of the simulation is the change of location and currency to be in line with participants' knowledge. The buyers' reservation price was ¥ 3 million, and the sellers' reservation price was ¥ 3.3 million. The experimenter distributed one audio recorder to each dyad, but only 52 out of the 57 dyads' audio recordings were audible to code the mediating variable, and the other five inaudible ones were random missing between the two conditions. Unlike Study 1 with a negotiation time limit, in this study, we informed participants that it normally lasts for 20 min, but they could take as long as they needed. The mean duration was 15.05 min ($SD = 6.01$), ranging from 6 to 28 min.

Manipulation and Measures

Creative Agreement

We measured our dependent variable using the same method as that used in Studies 1 and 2, and the two coders' consistency was Cohen's $\kappa = .86$.

Mental Fatigue

We asked participants to look at pictures displayed by a projector and complete the tasks in their exercise sheets. The first picture showed about five girls playing mahjong, and the second picture showed a cow, a dog, and a person sitting on the grass. We projected the two pictures in sequence for all participants, each for 10 min. The pictures they looked at were the same, but the instructions in their exercise sheets differed between the two conditions. In the mental fatigue condition, 58 participants were asked to make up a story for each picture. In contrast, in the mental energy condition, 56 participants were asked to write down what they saw from the two pictures as objectively as possible. We expected that making up stories would consume more mental energy than simply describing the pictures, and we included two measures as the manipulation checks right after this task. Participants were asked to report how they felt by responding to eleven questions. We used the same five questions used in Study 1 to assess participants' mental fatigue. In addition, six questions adapted and adjusted from Shirom and Melamed (2006) assessed participants' physical fatigue. The scale items were (1) I feel tired, (2) I have no energy for the subsequent tasks, (3) I feel physically drained, (4) I feel fed up, (5) I feel like my "batteries" are "dead," and (6) I feel burned out. The reliabilities of the two measures were $\alpha = .87$ and $.91$, respectively.

Integrative Complexity

We adopted Baker-Brown et al. (1992) coding manual to code integrative complexity. First, we transformed all 52 audible recordings to transcripts and asked two research assistants who were blind to our hypothesis to get familiar with the negotiation exercise and to read through the coding manual. Second, one author who had coding experience of integrative complexity trained the two coders and instructed

them to complete 17 dyads together to ensure that they understood the coding scheme and that they achieved inter-rater consistency. Third, the two coders worked independently for the remaining 35 dyads. Specifically, they strictly followed the coding manual and used a seven-point scale in which “1” indicates no evidence of either differentiation or integration, “3” indicates moderate to high differentiation but no integration, “5” indicates moderate to high differentiation and moderate integration, and “7” indicates high differentiation and high integration. The inter-rater consistency for the 35 dyads was $\alpha = .90$.

In this study, low levels of differentiation were reflected by a tendency to use a simple, one-dimensional rule to focus on the key issue (e.g., negotiators only discussed the price). In contrast, higher levels of differentiation were reflected by the recognition of multiple dimensions of the key issue (e.g., negotiators discussed alternative perspectives to understand the price and/or proposed additional issues to discuss). Then, when differentiated elements were discussed separately rather than synthesized, evidence of low levels of integration was inferred (e.g., negotiators identified additional perspectives but negotiated them separately); when differentiated elements were linked conceptually, evidence of high levels of integration was inferred (e.g., negotiators combined additional issues together to propose trade-offs).

Results and Discussion

Results of the manipulation check questions indicated that the two conditions had a significant difference in mental fatigue but no difference in physical fatigue. Writing stories lead to a higher level of mental fatigue ($M = 3.43$, $SD = 0.99$) than describing the pictures ($M = 3.04$, $SD = 0.95$), $F(1, 112) = 4.67$, $p = .033$. However, writing stories ($M = 2.51$, $SD = 0.98$) and describing pictures ($M = 2.45$, $SD = 0.97$) did not differ in physical fatigue, $F(1, 112) = 0.14$, $p = .710$. Thus, we concluded that the manipulation was effective, and the difference in the dependent variable could be attributed to participants' variance in mental fatigue.

H1 predicted that mental fatigue would witness fewer creative agreements. In the mental fatigue condition, 12 out of the 28 dyads reached creative agreements; in the mental energy condition, 21 out of the 29 dyads did so. The Chi-square test result showed that there was a significant difference: $\chi^2(1, 57) = 5.11$, Cramér's Phi = .30, $p = .024$. H2 predicted that the integrative complexity mediated this relationship, and we used Hayes's (2012) process model. It is worth noting that including or excluding the variable negotiation duration did not change the results, and all reported results in this study have excluded this control variable to be consistent with Study 4 regarding the mediation effect test. We found that, at the dyad level, mental fatigue negatively predicted integrative complexity ($B = -1.24$, $SE = 0.48$, $p = .012$, 95% CI = $-2.21, -0.28$) with good model fit ($p = .012$, $R^2 = .12$). Integrative complexity positively predicted creative agreement ($B = 1.09$, $SE = 0.33$, $p = .001$, 95% CI = $0.44, 1.74$) with good model fit ($p < .001$, McFadden's Pseudo- $R^2 = .32$). Overall, the indirect effect was significant ($B = -1.36$, $SE = 2.44$, 95% CI = $-4.40, -0.30$), and the direct effect was not significant ($B = -0.18$, $SE = 0.73$, 95% CI = $-1.62, 1.25$). Therefore, H1 and H2 were supported. Table 1 reports all results, and Figures 1 and 2 illustrate this mediation.

To achieve an in-depth understanding of the mediating variable integrative complexity, we conducted a supplementary analysis. We trained the two coders to code the number of additional issues that negotiators identified (e.g., co-management, offering jobs, etc.) and the number of packaging offers involving additional issues (e.g., “if I provide you loan with no interest, would you lower the sales price by 10%?”). The two numbers to some extent reflect the nature of differentiation and integration, respectively, and thus were used to proxy the two components. Coders achieved high consistencies regarding the two numbers ($\alpha = .86$ and $.79$). Negotiation dyads in this study on average identified 2.54 additional issues ($SD = 1.27$) and proposed 1.34 packaging offers involving identified issues ($SD = 1.41$). We modeled the indirect effect of mental fatigue on creative agreement through two mediators: the number of

Table 1
Estimates and Confidence Intervals of the Process Model

Models	Study 3				Study 4					
	<i>B</i>	<i>SE</i>	<i>p</i>	95% CI	<i>B</i>	<i>SE</i>	<i>p</i>	95% CI		
Mediator variable: integrative complexity										
Constant	1.05	0.77	.182	-0.51	2.60	3.48	0.16	.000	3.17	3.79
Mental fatigue	-1.24	0.48	.012	-2.21	-0.28	-0.60	0.22	.010	-1.05	-0.15
Dependent variable: creative agreement										
Constant	2.52	1.23	.040	0.11	4.92	-2.88	1.24	.020	-5.31	-0.45
Mental fatigue	-0.18	0.73	.803	-1.62	1.25	-0.83	0.58	.152	-1.98	0.31
Integrative complexity	1.09	0.33	.001	0.44	1.74	0.96	0.35	.007	0.26	1.65

Note. *B* represents unstandardized coefficients.

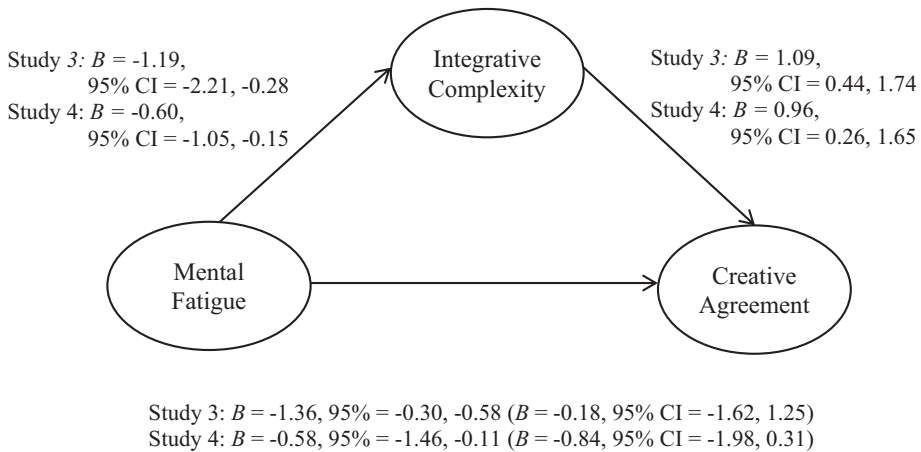


Figure 2. Integrative complexity mediates the relationship between mental fatigue and creative agreement.

additional issues and the number of packaging offers, sequentially. We found that neither the number of additional issues ($B = -0.31$, $SE = 4.13$, 95% CI = -1.73, 0.41) or the number of packaging offers ($B = -0.49$, $SE = 9.31$, 95% CI = -2.58, 0.17) could work as the mediator. However, the indirect effect through the two numbers sequentially was significant ($B = -0.50$, $SE = 4.23$, 95% CI = -1.77, -0.06). The overall indirect effect was significant ($B = -1.30$, $SE = 17.18$, 95% CI = -4.94, -0.27), but the direct effect was not significant ($B = -0.76$, $SE = 0.73$, 95% CI = -2.19, 0.67). In sum, the results had an important implication that simply identifying new issues or simply proposing packaging offers were not enough to link mental fatigue to creative agreement, but negotiators need to do both sequentially, and this is the essence of integrative complexity.

Study 3 tested the full model and found that negotiators' integrative complexity well explained the mechanism through which mental fatigue affects the likelihood of reaching creative agreements. Our manipulation influenced participants' mental fatigue but not physical fatigue, allowing us to rule out this alternative explanation. Also, we offered participants enough time to complete their negotiations instead of imposing a deadline, alleviating the potentially confounding effect of perceived time pressure. Moreover, the supplementary analysis results suggest that neither identifying additional issues nor using packing offers helped mentally energetic negotiators achieve a creative solution; instead, negotiators should first acknowledge as many perspectives as possible and then use as many offers as

possible to find the solution. Study 3 suffered from three limitations: (a) coding integrative complexity based on negotiation conversations did not well reflect individual thinking style, (b) manipulating mental fatigue by writing task was not in line with most previous methods, and (c) mental fatigue might affect people's emotional status in addition to cognitive capacities. To more properly manipulate our independent variable, code our mediating variable, and rule out this alternative explanation, we conducted Study 4.

Study 4

Participants and Procedures

We recruited 124 Chinese undergraduate students to participate in Study 4. Their mean age was 20.11 years ($SD = 1.77$), and 58.9% were women. First, when participants arrived at the behavioral laboratory, they were requested to turn off their phones and not use it during the experiment. They were then randomly assigned to either mental fatigue condition or mental energy condition, receiving the manipulation for 30 min. Second, they completed a pre-negotiation survey that had the manipulation check question and also measured their integrative complexity. Third, participants who were in the same manipulation condition were randomly assigned into the role of either a buyer or a seller, and they were given 10 min to read their negotiation role materials for the purpose of preparation. The negotiation exercise was a simplified version of the one we used in Study 1 with the same ZOPA structure. Fourth, they were informed that they had 10 min to try to reach an agreement that they found satisfactory and reported their negotiation outcomes when the time was up. It is worth noting that we gave participants brief materials and shorter negotiation time so that we could vary the negotiation time duration across studies and make participants fully concentrated on the negotiation task itself instead of spending time building relationships.

Manipulation and Measures

Creative Agreement

We measured our dependent variable creative agreement using the same methods as in Studies 1 to 3, and the two coders' agreement was Cohen's $\kappa = .97$.

Mental Fatigue

We randomly assigned participants to perform the AX-continuous performance test (AX-CPT) or to relax in a break room. AX-CPT is the most widely used method to induce mental fatigue (Guo, Ren, Wang, & Zhu, 2015; Marcora, Staiano, & Manning, 2009). In this task, letters were presented sequentially on the computer screen. Participants sat in front of a keyboard and were instructed to give a target response (press M) to a probe letter "X" that followed a cue letter "A." In all other cases, they had to respond with a nontarget response (press Z). In each trial, the letter displayed on the screen for 300 milliseconds, and then it disappeared for 1,200 milliseconds as the interval, during which participants could respond. Wrong responses would receive a sound warning. There were in total 1,200 trials, and the target AX letters constituted 30 percent of the letters. Finally, for a period of 30 min, 60 participants in the mental fatigue condition performed this AX-CPT task, and 64 participants in the mental energy condition were instructed to relax in the break room where they could read magazines but not play with their phones.

Integrative Complexity

In the pre-negotiation survey, all participants wrote down a 150-word essay to answer the open-ended question that negotiators should focus more on themselves or on their counterparts. Coding answers to

open-ended questions is the most widely accepted approach of measuring integrative complexity (Maddux, Bivolaru, Hafenbrack, Tadmor, & Galinsky, 2014; Moore & Tenbrunsel, 2014; Tadmor et al., 2012). Two coders who were blind to our hypotheses received training based on some answers and then independently worked through remaining answers with a seven-point Likert scale. “1” indicates no evidence of either differentiation or integration (e.g., “we should focus on the other party to know their bottom line.”), “3” indicates moderate to high differentiation but no integration (e.g., “we should anticipate counterparts’ personality and needs, and we should also think about our strategy.”), “5” indicates moderate to high differentiation and moderate integration (e.g., “it depends on many things such as our relative leverage, overall motive, and planned strategy.”), and “7” indicates high differentiation and high integration (e.g., “generally speaking, strong negotiators should focus on themselves, and weak negotiators should focus on the counterparts, and how to balance the focus further depends on whether they want to build a long-term relationship.”). Coders’ consistency based on the renaming 84 individuals’ answers was $\alpha = .91$.

Emotions

In order to rule out alternative explanations of emotions, we also measured negotiators’ positive emotion and negative emotion using the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The reliabilities for the two types of emotions were $\alpha = .90$ and $.84$, respectively.

Results and Discussion

We used the Rating Scale Mental Effort (Widyanti, Johnson, & de Waard, 2013; Zijlstra & van Doorn, 1985) as the manipulation check question. It asked participants to choose a number from a 150-point vertical line with 10 as the interval to indicate their level of mental energy. Results showed that participants in the mental fatigue condition ($M = 55.00$, $SD = 19.70$) reported much lower mental energy than those in the mental energy condition ($M = 69.38$, $SD = 19.75$), $F(1, 122) = 16.44$, $p < .001$. Also, the 60 participants in the mental fatigue condition spent more time (milliseconds) to respond in the task at the last five minutes ($M = 347.26$, $SD = 123.16$) than in the first five minutes ($M = 311.33$, $SD = 90.12$), $t(59) = 2.74$, $p = .008$. Thus, we conclude that our manipulation was successful.

H1 predicted the direct effect of mental fatigue on creative agreements. The Chi-square test result showed that 19 out of the 32 dyads in the mental energy condition reached creative agreements, but only 9 out the 30 dyads in the mental fatigue condition did so, $\chi^2(1, 62) = 5.40$, Cramér’s Phi = $.30$, $p = .020$. H2 predicted that integrative complexity mediated this relationship. Integrative complexity was an individual-level construct while creative agreement was a dyad-level construct, so we created three indicators of the dyad-level integrative complexity: the mean, the minimum, and the maximum of two parties’ integrative complexity scores, capturing the average, the lowest, and the highest levels of dyad’s integrative complexity. We ran the mediation model that mental fatigue affected creative agreement through integrative complexity using the three different indicators. We found that neither the mean ($B = -0.24$, $SE = 0.23$, 95% CI = $-0.91, 0.03$) or the maximum ($B = -0.03$, $SE = 0.11$, 95% CI = $-0.47, 0.09$) had significant indirect effect, but only the minimum could work as the mediator ($B = -0.58$, $SE = 0.35$, 95% CI = $-1.46, -0.11$). Specifically, mental fatigue manipulation affected the minimum of dyad’s integrative complexity ($B = -0.60$, $SE = 0.22$, $p = .010$, 95% CI = $-1.05, -0.15$) with good model fit ($p = .010$, $R^2 = .11$). The minimum of dyads’ integrative complexity affected creative agreement ($B = 0.96$, $SE = 0.35$, $p = .007$, 95% CI = $0.26, 1.65$) with good model fit ($p < .001$, McFadden’s Pseudo- $R^2 = .16$). The direct effect from mental fatigue manipulation to creative agreement was not significant ($B = -0.84$, $SE = 0.58$, 95% CI = $-1.98, 0.31$). Therefore, H1 and H2 received support. We also illustrated the results in Table 1 and Figures 1 and 2.

It is reasonable to predict that mental fatigue would yield negative emotions and inhibit positive emotions and hence affect agreement generation. We found that participants' positive emotion was significantly lower in mental fatigue condition ($M = 2.47$, $SD = 0.74$) than in the mental energy condition ($M = 2.74$, $SD = 0.65$), $F(1, 122) = 4.69$, $p = .032$, and their negative emotion was significantly higher in the mental fatigue condition ($M = 1.94$, $SD = 0.63$) than the mental energy condition ($M = 1.54$, $SD = 0.47$), $F(1, 122) = 16.87$, $p < .001$. However, neither the dyad-level positive emotion ($B = 0.33$, $SE = 0.34$, 95% CI = $-0.03, 1.26$) nor negative emotion ($B = 0.26$, $SE = 0.34$, 95% CI = $-0.34, 1.02$) could act as the mediator of the relationship between mental fatigue and creative agreement. In addition, we added the two emotions into our original mediation model, and the mediating role of integrative complexity remained significant ($B = -0.89$, $SE = 0.51$, 95% CI = $-2.18, -0.17$).

In this study, we replicated our findings using the standard AX-CPT task to manipulate mental fatigue and the standard open-ended question coding to measure integrative complexity. We found that the lowest level, rather than the average or the highest levels, of a dyad's integrative complexity, explained the mechanism. We infer from this result that the likelihood to generate creativity agreement is mainly influenced by the party with a relatively lower level of integrative complexity in a dyad. We remind caution when interpreting this result, but overall, we replicated the mediation effect with different manipulations and measures in this study. We also ruled out the alternative explanations of positive and negative emotions as the mediating mechanisms. In sum, we found further support of our main effect and mediating effect.

General Discussion

When perceiving the nonexistence of ZOPA, negotiators have every reason to consider leaving the table. However, our findings suggest that mentally energetic rather than fatigued negotiators can remain cognitively flexible by engaging in integrative complexity and hence be more likely to reach a creative agreement, which can satisfy both parties' underlying interests even when their presumed resistance points are overlooked. The key is integrative complexity, of which differentiation and integration together capture a unique thinking structure that identifies multiple alternative dimensions of one concept and then synthesizes them back together. Results from our supplementary analysis further suggest that just identifying many additional issues or simply proposing many packaging offers is not enough to contribute to the creative agreement; negotiators need to do both sequentially. This result echoes the creativity procedure during which divergent thinking comes first and convergent thinking follows (Brophy, 2001). In addition, we find that the negotiation party with a lower level of integrative complexity may determine the baseline of the dyad's level of integrative complexity in negotiating a creative agreement. We have ruled out alternative explanations such as negotiation time duration, physical fatigue, and emotions.

Theoretical Contributions

Our findings make three contributions to the literature. First, by studying creative agreement in distributive negotiations without apparent ZOPA, we gain insights into this important yet understudied negotiation context. People expect an impasse when ZOPA does not apparently exist, yet empirical studies and real-world examples suggest alternative possibilities (Anderson & Thompson, 2004; Sinaceur et al., 2013). We draw insights from previous studies and examine the role of mental fatigue as one predicting variable of creative agreement. Mental fatigue is ubiquitous and presumably influencing negotiators' cognitive capacities, but has received little attention in the negotiation literature. This research adds new knowledge on how this dynamically changing individual mental feeling affects negotiation processes and outcomes. In addition, creative agreement is a very common practice in real-world negotiation but unfortunately receives very limited scholarly attention. Previous studies have often focused on explaining the psychological reasons of when and why negotiators have agreement bias (Cohen et al., 2014;

Thompson & Leonardelli, 2004; Tuncel et al., 2016). We shift our focus to investigate the opposite—when and why negotiators can reach a creative solution. Our effort advances the knowledge of outcomes in negotiations without apparent ZOPA beyond the agreement–impasse dichotomy.

The literature has somehow overlooked mental fatigue and creative agreement. This is partially due to the fact that most prior studies rely on negotiation tasks with apparent ZOPA and predesigned issues. In those tasks, negotiators usually identify logrolling among given issues, so how negotiator understand the relative importance of different issues is the key, and hence it is theoretically reasonable to focus more on factors that influence this information processing, such as social motives, interpersonal trust, and cultural background (Brett & Thompson, 2016). However, when ZOPA does not apparently exist, negotiators need to move beyond the presumed resistance points, and hence their cognitive capacities play a more salient role.

Second, this research contributes to the creativity literature by examining integrative complexity as the mechanism and revealing the process of creative problem-solving in negotiations. Although scholars have widely acknowledged that negotiation entails “thinking outside the box,” very few studies empirically examined this thinking structure (Sharma et al., 2013). Prior studies usually conceptualized and operationalized creativity as a stable personality rather than a dynamic problem-solving process (De Pauw, Venter, & Neethling, 2011; Kurtzberg, 1998; Schei, 2013). Instead, we focus on the creative problem-solving process by showing that integrative complexity, brainstorming additional perspectives and then linking those conceptual dimensions together, explained how creative agreement emerges. Sinaceur Maddux Vasiljevic Perez Nüchel and Galinsky (2013) found that identifying additional issues is the key to creative agreements in negotiations without apparent ZOPA. We extend their findings by showing that simply identifying additional issues might not be enough, and negotiators need to propose packaging issues that involve those newly identified issues. This finding implies the importance of synthesizing both divergent thinking and convergent thinking sequentially in negotiations that require creativity (Brophy, 2001).

By focusing on creative problem-solving, this research also sheds light on value creation beyond structured, quantitative, integrative negotiations to unstructured, qualitative, so-called distributive negotiations. How negotiators create values and maximize joint gains in integrative negotiations has been well documented, assuming that we should focus on claiming values in so-called distributive price negotiations. However, some scholars suggest that instead of focusing on the integrative versus distributive negotiations as the label, we should focus more on the actual value-creating versus value-claiming behaviors (Sebenius, 2015; Thompson, 1998). We show that it is possible to create values in a preconceived, so-called distributive negotiation since creative agreements meet the very standard of value-creating—searching for something “better for both parties” (Thompson, 1998, p. 46).

Third, by applying and testing the cognitive flexibility theory from education psychology to negotiation settings, this research extends the scope of the theory to interdependent social interactions. This theory was originally introduced to understand how employing multiple perspectives facilitates knowledge acquisition in ill-structured domains (Spiro & Jengh, 1990). The core insight of this theory emphasizes the ability to represent knowledge from different conceptual and case perspectives and then, when the knowledge must later be used, the ability to construct from those different conceptual and case representations a knowledge ensemble tailored to the needs of the understanding or problem-solving situation at hand (Spiro, Feltoovich, Jacobson, & Coulson, 1992). We borrowed this core insight and conceptualized and operationalized this thinking style as integrative complexity. This application extends the scope of the theory in two ways. First, the theory can be applied in the interpersonal problem-solving context beyond knowledge acquisition. Second, multiple representations suggested by the theory can be conceptualized as using multiple dimensions to reframe a problem rather than using multiple technologies to demonstrate a problem. These two extensions open new research avenues for the cognitive flexibility theory.

Practical Implications

From the practical point of view, this research suggests the importance of preparing one's own mental energies, identifying the counterparts' fatigue, and taking a strategic break. We can infer that staying cognitively relaxed and energetic enables negotiators to face a difficult situation, which is usually characterized by the absence or smallness of ZOPA. To better prepare for a negotiation, scholars emphasize the importance of information collection (Volkema, 2004), alignment of interests (Brett, Friedman, & Behfar, 2009), and emotional readiness (Leary, Pillemer, & Wheeler, 2012). This research suggests that negotiators should also pay attention to their own mental states as well as that of their counterparts. Our findings by no means suggest the necessity of reaching creative agreements all the time when ZOPA is inapparent because it is sometimes unrealistic and unfeasible. Instead, we suggest that we should not leave the negotiation table immediately just because ZOPA does not exist at first glance.

Another practical implication of this research is that people who do not possess a creative personality are still capable of displaying creative problem-solving in the negotiation context. We agree with previous studies that a creative personality and creative behavior are highly correlated (Oldham & Cummings, 1996). But our findings suggest that mental fatigue can affect negotiator's integrative complexity, which is not determined by personality. By intentionally identifying additional perspectives and proposing packaging proposals, negotiators can creatively identify, understand, and solve the problem and also use these behaviors to signal to the other party their willingness to be flexible and cooperative. By doing so, negotiators could greatly increase the likelihood of reaching a mutually beneficial agreement. We thus suggest one possibility of boosting creative problem-solving in negotiations.

Limitations and Future Directions

The first limitation of this research concerns the narrow scope of creative agreement. We defined and measured creative agreement based on the literature (Sinaceur et al., 2013) as the solution that goes beyond the presumed resistance points but added additional terms. However, some participants in our studies choosing to violate the given resistance points to research agreements might just want to avoid the uncomfortable impasse, and the added new terms could be unrealistic. We acknowledge this limitation, but the fact that participants had to go beyond the resistant points and identify new terms based on their own best knowledge of feasibility did tap the essence of creativity. Also, we analyzed creative agreement at the dyad level due to its dyad nature, but by doing so, we were unable to reveal some more meaningful information about the within-dyad creative dynamics. For example, what if one negotiator is mentally energetic and the counterpart is mentally fatigued? Future studies could conceptualize and capture creative agreement from a broader scope, test the effect of mental fatigue in integrative negotiation contexts, and focus more on the within-dyad interaction regarding creative problem-solving. In this way, we may achieve a better understanding of the unique feature of dyad creativity compared with individual or group creativity.

The second limitation of this research concerns our choice of ZOPA-inapparent, distributive negotiations and the generalizability of our findings to ZOPA-apparent, integrative negotiations. The nonexistence of ZOPA, at least seemingly, offered us a salient context to observe how negotiators go beyond the presumed distributive nature. Our definition of creative agreement advocated our choice of this particular negotiation scenario which is theoretically important yet empirically understudied. But it is also theoretically reasonable to anticipate a negative influence of mental fatigue in other negotiation scenarios such as integrative negotiations with multiple prescribed issues. For example, De Dreu, Giacomanonio, Shalvi, and Sligte (2009) found that the distributive issue in the integrative negotiation could produce obstacles and prevent creative solutions. However, the way mental fatigue generates influence and the way people behave creatively in integrative negotiation may be different from what we revealed in this research.

Future research should pay more attention to the creative problem-solving process during the negotiation. Negotiators' perception of ZOPA and their interests could be dynamic rather than fixed during this process, and we need to get a more in-depth understanding of this change. Also, the motivation and mechanisms behind how creative negotiators understand problem complexity and show flexibility need further empirical tests. Properly designed laboratory simulations with quantitative information, fixed issues, and given options help us understand the negotiation process in a rigorous and comparable manner. But in many real-world settings, negotiators need to design protocols, identify negotiable issues, and generate options by themselves. In the future, we should also consider employing new research methods to capture different creative negotiation behaviors. To do so, we may have to go beyond the distributive–integrative dichotomy because the real-world negotiations do not label themselves, and we may have to also go beyond the structured negotiation scenarios with predetermined issues and payoffs.

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