Mindful Attraction and Synchronization: Mindfulness and Regulation of Interpersonal Synchronicity

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ABSTRACT

We sought to test whether mindfulness can increase interpersonal synchronicity. To achieve this, a novel method was developed to measure complementary cognition and behavior in dyads. Pairs of individuals in a mindful treatment and control group were asked to converse in pairs, separate and complete another task, and return to talk again when they felt ready. Control group pairs returned in a relatively uniform amount of time, while mindful pairs displayed a higher level of differentiation. Mindfully primed partners enjoyed the second conversation more, were rated as being more comfortable with each other, and often returned closely together. Individuals and pairs high in trait mindfulness also had increased enjoyment. Additionally, the mindful group showed a physiological matching in the closeness of their heart rate. These results suggest that mindfulness, when present, can regulate coordination dynamics and increase interpersonal synchronicity.

Key Words: synchrony, synchronicity, mindfulness, interpersonal coordination, coordination dynamics

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Introduction

The concept of mindfulness has been defined in many ways since first researched in the late 70's and 80's (Langer and Abelson, 1972; Langer *et al.,* 1978). The various definitions typically involve an attempt to increase an individual's level of attention and awareness, and may depend on employment of traditional techniques such as meditation or noticing novelty (Alexander *et al.,* 1989). For instance, a common definition of mindfulness is one that requires a moment-to-moment awareness that is non-judgmental in nature, and it has been shown to provide emotional benefits such as relief from anxiety and stress (Kabat-Zinn *et al.,* 1992). But the process of active mindful noticing and distinction-making is also necessary for regulating responses to potential attractors and stressors, and is known to facilitate decision-making and enhance well-being (Langer, 1989).

For the purposes of this article, the construct of mindfulness is defined as the process of actively noticing new things, which inherently leads to distinction-making, attention to the variable nature of things, and putting things into context (Langer *et al.,* 1978; Langer and Moldoveanu, 2000). It is different from simple awareness and attention in that mindful noticing increases discernment through gathering information and differentiating the qualities of things. This kind of active mindfulness and distinction-making has been shown to lead the mind to an improved dynamic state and leads to enhanced creativity, social performance, and health (Langer, 1989; 1997; 2005; 2009).

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Mindfulness may be distinguished from its opposite, a "mindless" habituated mindset where preexisting cognitive commitments over-determine cognition and behavior (Langer and Chanowitz, 1981). Mindlessness results in a narrow outlook and decisions limited by a lack of awareness of many possibilities, while mindfulness results in understanding the variable nature and context of events, and the many possible opportunities for a more effective and positive interpretation of them (Langer, 1989). Behavior may be mindless when it involves excessive automaticity and routine patterns of response lacking a sense of real or perceived control (Langer and Rodin, 1976). A negative or helpless mindset may be assumed to be satisfactory but is limited in its potential to yield positive results (Seligman, 1972). Mindfulness allows for increased control over behavior and presents new opportunities for positive responses (Crum and Langer, 2007).

A considerable amount of research now supports the fact that mindfulness improves well-being by boosting both cognitive and physical performance, enhances social behavior due to becoming less judgmental, and creates positive states of mind/body (Langer, 2009). Mindfulness not only promotes better health and enhances social and cultural performance, but has also been shown to increase longevity (Alexander *et al.,* 1989; Langer, 1989; 2009; Langer and Rodin, 1976; Langer *et al.,* 1979; Rodin and Langer, 1977). For instance, elderly individuals primed to see themselves as younger and encouraged to be more active both cognitively and physically, exhibited extraordinary improvements in their capacities (Langer, 1989; 2009). However, it is often necessary to prime a mindful state when individuals have lost their natural inclination to be mindfully engaged.

A mindful mode of operation may be based on strongly present personality "trait" or learned characteristics, and at other times may need to be primed or induced (Bodner and Langer, 2001; Pirson *et al.,* 2012). When mindful attention is central to an activity, such as in observing art or performing music, states of high mindfulness are easily induced by instructions to notice different things or create distinctive ways of doing the activity. People who mindfully create art and music have an increased enjoyment of their experience (Langer, 2005). Musicians encouraged to perform a symphony mindfully enjoyed the creative performance of the music more and listeners enjoyed the music more as well (Langer *et al.,* 2008). In other domains such as in interpersonal relationships where there are complex variables at play, strongly developed trait mindfulness may be required to yield a positive result. For example, when present, trait mindfulness has been shown to increase marital satisfaction as much or more than interpersonal similarity itself (Burpee and Langer, 2005).

While mindfulness is known to improve social interactions, its specific mechanics in interpersonal coordination dynamics are not as well understood. It is less clear how mindfulness improves the cooperative alignment in behavior that is required for sophisticated group functioning and productive relationships. Dynamic group behavior often involves complex aspects of interpersonal coordination that are necessary for behaving together effectively in a group as a function of time (Haken *et al.,* 1985; Semin, 2007). Coordination in time, such as in groups performing music together (Aschersleben, 2003) or in small group conversational dynamics (Rotondo and Boker, 2002), often involves complementarily aligned behavior that requires attention to a variety of social cues and distinctive interpretations and responses. This introduces the question of how such alignment in behavior would be regulated through mindfulness.

Interest in the details of simultaneously coordinated psychological events and interpersonal synchrony has dramatically increased since the discovery of the mirror neuron system (Gallese, 2001; Semin and Cacioppo, 2008). There is now a considerable amount of evidence supporting the existence of interdependent complementary states in parts of the brain when people do things together in time, whether for an organized group performance or a simple conversation (Lerner *et al.,* 2011). There is often a cognitive matching in conversation that results in simultaneous activity in identical areas of the brain during 'coupled' behavior (Guillaume *et al.,* 2010; Lerner *et al.,* 2011; Stephens *et al.,* 2010). This kind of synchrony and sophisticated coordination is likely to have evolved to support biological and social purposes such as group hunting/foraging, feeding, and mating (Davidson and Menaker, 2003; King and Cowlishaw, 2009; Weller and Weller, 1992). The capacity may maximize success in groups

and enhances chances for growth and survival. In modern civilization, synchronously coordinated behavior may serve other productive social and creative purposes. For example, during conversation two or more people typically align elements of their conversational timing (Collis and Schaffer, 1975) and coordinate meetings with each other at specific times.

Individuals may constantly seek to be in alignment or "in sync" with others in interpersonal relationships. At times, we may feel that we are "on the same wavelength," have a special meeting of minds, or an implicit relation with others (Hogenson, 2009; Hove, 2008; Hove and Risen, 2009; Lyons-Ruth, 1998). Moments of positive cooperatively aligned interpersonal relation represent some of our most enjoyable and valuable experiences. They may represent special points of "moments of meeting" of our mind with others and times when where there is a shared appreciation of achievement and a realization of mutual goals (Hogenson, 2009). This kind of cognitive and behavioral alignment involves cooperative functioning that is not merely imitation or mimicry typical of synchrony. It involves complementarily aligned and matched behavior that is coherent in time but not identical, and may involve intervening periods of time and the "emergence" of a complementary state (Cambray, 2002).

Experiences of special cognitive and behavioral alignment have traditionally been called "synchronicities" (Jung, 1955). Jung defined synchronicity as a moment when an inner subjective state is specially aligned with another person or event in a way that is meaningful yet appears to be causally unrelated. At the time he developed the concept, he could not explain the psychological mechanics of interpersonal synchronicity, but improved theoretical explanations are now possible. For instance, there are potential mechanisms through the mirror neuron system and subconscious inference, unconscious goal seeking (Custers and Aarts, 2010), and unintentionally coordinated synchrony (Richardson *et al.,* 2007). Dyads may become aligned through the perception of subtle cues in behavior or movement of body position that signal others' intentions and goals. Individuals may anticipate and align with other's actions in a mutually beneficial way through a synchronicity of cognition, emotion, and action.

Achieving moments and states of peak interpersonal efficiency and synchronicity are certainly a desirable goal in relationships. When attuned with others, synchronicities may occur frequently and can be considered like a peak experience or optimal flow in interpersonal relationships (Csikszentmihalyi, 1991). Individuals who experience synchronicity will want to meet with other people to continue to experience more of such enjoyment and pleasure (Freud, 1961). For example, recent studies have demonstrated that pro-social attitudes lead to greater bodily movement synchrony and "syncing" than individualistically centered behavior (Neda *et al.,* 2000; Lumsden *et al.,* 2012; Valdesolo *et al.,* 2010; Vacharkulksemsuk and Fredrickson, 2012). Cooperative alignment of behavior requires detailed attention to a variety of social cues, interpersonal appeal and attraction, and effective decision-making. Thus, we expected that those who are mindfully attuned would experience more synchronicity in their lives.

We predicted that mindfulness would improve interpersonal coordination and productive interaction in cooperative group behavior through several mechanisms. Of course we expect mindfulness to facilitate interpersonal interaction by increasing familiarity with others and by enhancing interpersonal charisma and appeal (Langer, 2005; Langer *et al.,* 2012). But mindful noticing also increases attention to important social cues, which may be revealed through speech and movement of the body. A mindful person will therefore be aware of a greater number of cues and information and can respond to them effectively. For interpersonal timing, this may be particularly important because the "zeitgeber" time givers that help coordinate and entrain people with each other are revealed through social signals as well as explicit communication (Davidson and Menaker, 2003). For example, there is recent evidence demonstrating that social synchronization through finger-tapping may persist in time even when the paired individuals are physically separated following initial entraining cues (Oullier *et al.,* 2008). Mindful individuals may become increasingly attuned to such cues and make adjustments in their behavior to maximize resonance or dissonance and increase embodied memory and rapport (Miles *et al.,* 2010; Vacharkulksemsuk and Fredrickson, 2012). Increased awareness of specific cues that reveal goal-oriented and time-dependent

behavior may be critical for making optimally cooperative decisions (Gallese *et al.,* 2007; Semin and Cacioppo, 2008).

Mindfulness also increases awareness of variable information about others that is dependent upon context and conditions (Langer, 1997). A mindful person will make increasingly informed and productive decisions if they perceive positive or negative factors accurately and are aware of another person's perspective (Djikic and Langer, 2007). They may also adjust their behavior and experience these things in a more beneficial way. For instance, there are times when a choice must be made whether to align with others or to avoid automaticity in conforming to expectations (Langer, 1997). An optimal decision would be tailored to the context of the situation through increased control over responses. At times it is beneficial to be closely aligned with others and at other times an automatic synchronization would not be optimal. Thus, we expected mindfulness to variegate decision-making, especially about how and when to experience synchronicity with other individuals and groups.

We therefore hypothesized that mindfulness would result in improved interpersonal dynamics through these mechanisms including increased noticing of social cues and signals, distinction-making, awareness of variability and context, and differentiation of interpersonal appeal and attraction. Our primary hypothesis (H1) was that mindfulness would increase interpersonal synchronicity. We predicted that this would occur through two modes of observed cognitive and behavioral regulation: improved decision-making about the timing and coordination of interactions, and enhanced interpersonal interactions resulting in greater enjoyment and comfort. Mindfulness was expected to result in increased positive well-being and more "synchronicity" on the whole by regulating interpersonal attraction and synchronization.

To test this hypothesis, an experiment was designed involving pairs of individuals who would meet for a brief conversation. After an initial meeting, the individuals were separated and asked to rate their experience and given a choice about when to return to meet with their partner again. It was expected that those who enjoyed the interaction would return more rapidly and simultaneously to continue their conversation with their partner, while others were expected to take longer to return. We predicted that mindful pairs would make improved decisions about how and when to return, and that the mindful group would generally experience greater enjoyment and comfort upon returning. Mindfulness was expected to facilitate synchronicity with others in a beneficial way and to decrease negative obstacles if necessary. Synchronicity was operationalized as a general positive construct measured as matched heart rate (HR) in dyads, increased comfort and enjoyment after making a decision, and increased simultaneity.

Method

Participants

A total of 92 participants were recruited from the Harvard University study pool through the Sona registration system. An incentive of $10 or one study pool credit was offered for one hour of participation. There were no selection criteria except the requirement to be between the ages of 18-40. One pair of participants was excluded because an individual was not able to follow the procedures due to a disability. All other participants and measurements on them were included whenever possible in the data analysis.

Of the final 90 participants, 49 were female and 41 male with an average age of 23.0 years (SD = 5.30). There were 22 pairs of participants in the mindful treatment group and 23 in the control group. The treatment and control group were similar in their characteristics, including racial composition, with an average age of 23.3 (SD = 5.40) in the mindful group and 22.8 (SD = 5.25) in the control group. In the mindful group there were 11 pairs of the same sex (5 m/m and 6 f/f) and 11 pairs of opposite sex (m/f). In the control group, there were 13 pairs of same sex (5 m/m and 8 f/f) and 10 pairs of opposite sex. The average age difference between partners in the mindful group was 5.27 (SD = 4.3) and 4.30 (SD = 4.95) in the control group.

Materials and Measures

A brief demographic questionnaire asked participants to report their sex, age, occupational status, and educational level. The Langer Mindfulness Scale (LMS) was used to determine each participant's relative level of personal mindfulness. The LMS is a 21-question survey proven to be an accurate measure of relatively stable trait mindfulness (Bodner and

Langer, 2001; Haigh *et al.,* 2011). Recent efforts to refine the scale (Pirson *et al.,* 2012) found further accuracy using a shortened 14-item version. The Mini International Personality Item Pool (Mini-IPIP) developed by Donnellan *et al.* (2006) was used to obtain a rapid assessment of participants' personality traits.

A questionnaire containing five questions about each participant's enjoyment and opinions of their initial conversation was placed in a folder with additional instructions. A second set of two questions was designed for completion at the end of the experiment after the second conversation. Mindful and control group participant conversation instructions were placed in an envelope so the experimenter was blind to treatment condition.

A Devon 300P handheld finger pulse oximeter was used to record heart rate. The oximeter provides an accurate reading of heart rate after approximately 5-10 seconds of measurement on an individual's finger. An iPhone was used to time the 15-minute conversation with the pClock app countdown timer that beeps twice when the time is up.

Video recording was performed through a video camera recording system installed in the laboratory. Participants' apparent enjoyment and comfortableness with each other was estimated by four raters who were psychology students blind to condition and the hypothesis. Each rater was asked to subjectively rate approximately 20 pairs during 1 minute segments of video. Each rater evaluated an equal number of treatment and control group pairs, and all pairs were rated twice by two different raters. Inter-rater reliability was supported by the observation of a similar trend between all raters at time segment 4 (the likelihood of a real effect was calculated to be $p = .013$, or 77 to 1 against chance).

Design

The study used a two group design consisting of a mindful group told to notice 10 different things about their partner during a 15 minute conversation and a control group without the additional mindfulness instruction. The simplified mindfulness instruction was expected to prime mindfulness, particularly in those who were mindfully inclined. Enjoyment of the conversation was expected to determine the speed of return to the meeting room (time of return). Synchronization would be measured in the closeness of the time at which the two participants return and sit together again (simultaneity). Mindful and control groups contained a random mix of same and opposite sex pairs and age differences between partners.

Instructions told participants to return to the meeting room when they "feel ready" after the initial 15 minute conversation. The participants would make an intuitive decision and were aware of when the other returned. The physical layout of the lab was such that there was an approximately equidistant walking distance for the participants. The experiment was designed so there would be a decision-making process that would depend on the prior level of interpersonal bonding and that would also be influenced by the actions of the other person.

Procedure

Participants were allowed to sign up into timeslots in the registration system during the months of March and April, 2011. No attempt was made to screen or match pairs of individuals with each other based on any specific characteristics such as age, sex, or race. Upon arriving at the laboratory, the first participant was asked to wait until the other participant arrived. When both participants were present, they were then asked to fill out the demographic questionnaire, LMS, and personality survey.

Upon completion of the surveys, each participant's pulse was taken. To minimize the effects of exertion in getting to the lab and initial anxiety, at least 5 minutes always elapsed after the participants' arrival before all pulse readings. A stable reading of the oximeter was verified by following heart rate for several seconds after the initial reading. In several instances heart rate could not be measured due to small or rigid fingers that did not create enough pressure; measurements at those time points were excluded.

After completing the surveys, the participants were brought together and asked to sit across from each other at a table. They were told they would have a conversation for 15 minutes with their partner and should follow the specific set of instructions in the folder on the table. They were told that in 15 minutes the timer alarm would ring and at that time they should return to their initial desk areas, follow

the instructions there, and answer the questionnaire.

From the point when the timer was begun, the experimenter watched from video in an adjacent room. At the end of the experiment after the partners returned for the second conversation and a subsequent total of 10 minutes had elapsed, their pulses were recorded again while together in the meeting room. After completion of the final survey, participants were debriefed and asked if they had any difficulties following the instructions or if they had any other concerns.

Data Analysis

Time of return was measured by the time it took for each partner to return and enter the meeting room. Simultaneity was measured as the difference in time between partners in the moment they sat down again. It was also expected that partners would exhibit a matching of their heart rate when mindfully involved (for a related study of heart rate control, see Delizonna *et al.*, 2009). A difference for each pair's heart rate was determined at the beginning and end of the experiment, and a between groups comparison of the group means was planned at these two time points. Video recorded conversations were evaluated by raters at 5 minute intervals (2.5 mins, 7.5 mins, 12.5 mins, and 2.5 mins after both returned) to judge each pair's apparent enjoyment and comfortableness. Additional analysis was planned for correlations of enjoyment as a function of LMS, interpersonal liking, sex in pairing (same and opposite sex pairs), and relatively large age differences.

Results

There was a significant correlation of enjoyment with trait mindfulness in the mindful primed group ($r = .39$, $p < .01$), although the mindful group did have lower self-reported ratings on all questions (Table 1). There was also a significant main effect for increased enjoyment of the initial conversation between high (LMS ≥ 76) and low (< 76) trait mindfulness individuals ($F(1, 86) = 5.45$, $p < .05$). These results indicated that trait mindfulness was effective and that many individuals were primed by the mindful treatment to have a more enjoyable experience. Additionally, enjoyment was found to increase with age in the mindful treatment group ($r = .34$, $p < .05$) (Table 2). Thus, under the conditions of this experiment, the mindful treatment appeared to activate mindfulness in many participants and may have created a wider range of responses in younger college age individuals.

Table 1. Responses to Questionnaire. * p < .05. ** p < .01.

Question	Mean (M+ N=44) (M- N=46)	SD	SE	Difference Between Means	t	df	p (2-tailed)
Enjoy M+	7.61	1.78	0.27	1.00	-3.02	88	.003**
M-	8.61	1.32	0.20				
Other Enjoy	6.77	1.87	0.28	1.01	-2.73	88	.008**
	7.78	1.65	0.24				
Mood	7.15	2.00	0.30	0.68	-1.84	88	.070
	7.83	1.48	0.22				
Other Mood	7.13	1.68	0.25	0.57	-1.76	88	.083
	7.70	1.40	0.21				
Other Mind	6.95	1.58	0.25	0.74	-2.43	88	.017*
	7.70	1.30	0.19				
Like	7.95	1.47	0.22	0.42	-1.40	88	.165
	8.37	1.34	0.20				
Other	7.19	1.48	0.22	0.56	-1.95	88	.054
Like You	7.75	1.22	0.18				

Table 2. Correlation of Enjoyment with Other Variables. * p < .05. ** p < .01.

Variable	LMS14	Age	LMS14 (Age difference ≥ 5 years)	LMS14 (Age difference < 5 years)	Time of Return
Mindful	.39**	.34*	.34	.40*	-.19
Control	.04	.16	.58*	-.18	-.35*

Multiple regression in both groups with liking and LMS accounted for more than 50% of the variance in enjoyment (R^2 = .510, F (2, 87) = 44.8, p < .001). Subjective liking of one's partner was the stronger factor (β_{LMS} = .128, p < .05, β_{like} = .680, p < .001) as would be expected for a brief interpersonal interaction. Along with other factors such as age differences and personality traits, personal liking did influence the effects of the priming treatment on the dependent variables of time of return and simultaneity. Results using summed dyad totals were similar to individuals' enjoyment, though multi-level modeling for other dependent variables was inconclusive. This was most likely due to the fact that the experiment was designed primarily to examine how individual decisions would regulate the effects of dyadic coupling.

For participants' time of return after the initial 15 meeting conversation, there were 4 unique outlier pairs in the control group in which the participants did not return to the meeting room or did so very slowly (> 360 seconds). Notably, there were no such cases in the mindful group, as the mindful group participants always returned within 313 seconds, perhaps reflecting a more mindful response. The outliers are excluded from all analyses that require return to the meeting room due to the ceiling effect times of 600 s.

As visible in Figure 1, in the control group an individual's time of return after the initial meeting conversation was strongly correlated with their enjoyment of the conversation (r = -.35, p < .05). A faster decision and return time was predicted with increased enjoyment due to the seeking of a further positive experience. A similar relation was observed for the mindful group but was not quite significant due to the differentiation in their behavior. The control group pairs returned in a relatively uniform amount of time while the mindful group pairs appeared to be differentiated into slower and faster returning pairs (Figure 2). In the control group, the average time of return was consistently centered around a single value (N = 38, M = 133.6 s, SD = 35.3). The mindful treatment group was less homogeneous with a larger spread (SD) around a single value (N = 44, M = 164.8 s, SD = 56.9). This confirmed our expectation of variability, and further analysis of fast and slow returners was performed in a post hoc analysis.

Figure 1. Time of return and enjoyment. Times of return are correlated with enjoyment.

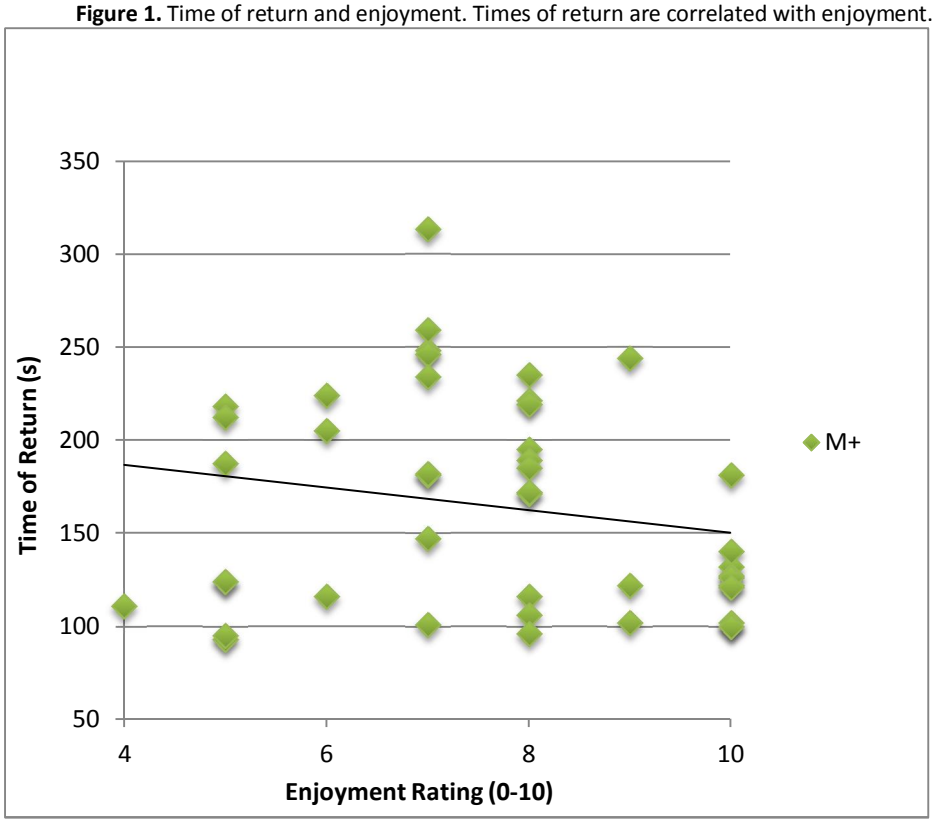
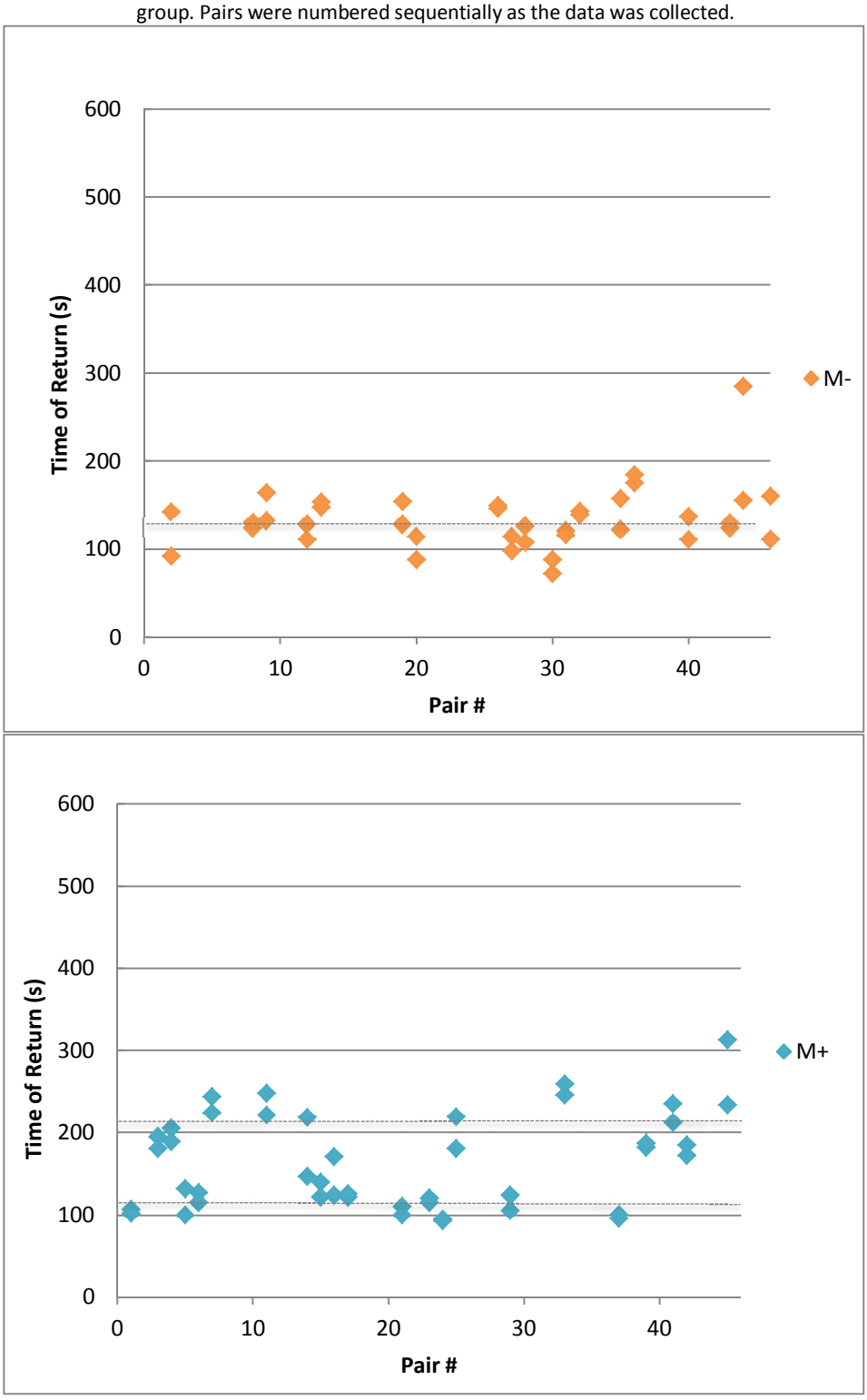


Figure 2. Mindfulness increases differentiation. Times of return show uniformity in the control group and differentiation in the mindful group. Pairs were numbered sequentially as the data was collected.



An explicit sign of synchronization was measured as simultaneity in the difference in time between each partner sitting down again in their chair across from the other at the meeting table. The average time between each individual in the pair sitting in the mindful group was not significantly different between the entire mindful group (N = 22, M = 21.5 s, SD = 21.9) and control group (N = 19, M = 24.7 s, SD = 29.8). However, the fast returners in the mindful group appeared to return more closely together than the fast returners in the control group (post hoc analysis). Our prediction was that some pairs would be more attracted due to

the mindful treatment, though it is likely a stronger synchronization can only occur when there is sufficient alignment on multiple factors.

Both groups exhibited a similar small drop in heart rate between the beginning and end of the experiment that were not significant (Table 3). A slightly lower final heart rate would be expected due to the initially higher anxiety and prior physical exertion in getting to the lab. Planned analysis of matching of heart rate predicted a closer matching for mindful partners relative to the control group at the end of the experiment. At the beginning of the experiment at time 1 there was no significant difference (Table 3) between the mindful and the control group in an independent samples t-test. However, at the end of the experiment (time 2) there was a significant difference between the mindful and control group ($t(36) = 1.73$, $p < .05$).

Table 3. Heart Rate Comparison. *Note.* *p < .05 between mindful and control group at time 2.

Group	Heart Rate Time 1 (bpm)	Heart Rate Time 2 (bpm)	Difference Δ (t2-t1) (bpm)
Mindful (mean)	76.6	74.1	Δ -2.5
SD	(12.9)	(11.5)	
N	40	42	
Control	78.2	76.1	Δ -2.1
	(12.4)	(12.2)	
	34	34	
Mindful (difference between partners)	12.32 (diff.)	8.90 (diff.)	Δ -3.42* (closer)
	(8.27)	(7.18)	
	19	21	
Control	13.29	13.71	Δ + 0.42
	(9.58)	(9.94)	(apart)
	17	17	

The video recorded behavior of participants was used as an additional measure to determine how much the pairs enjoyed their conversations and how comfortable they appeared. Pairs were judged by raters at 5 minute intervals where the fourth interval represented the second conversation after returning again. As expected with increasing familiarity, partners in both groups became more comfortable with each other and enjoyed their conversation more as time progressed (Figure 3). Importantly, after the participants made their decision to return, the mindful group then became significantly higher than the control group for both enjoyment ($t(39) = 1.81$, $p < .05$) and comfortableness ($t(40) = 1.87$, $p < .05$). The fact that the mindful pairs were more comfortable with each other later in the experiment also agreed with the physiological matching of heart rate data. These results collectively support the hypothesis that the mindful treatment enhanced the interactions and decisions about returning, resulting in an improved second conversation.

Post Hoc Analysis

The mindful and control groups were analyzed using a median split value at 140 seconds that demarcated the most equal number of fast and slow individuals in both groups (counting the very slow and non-returners). Fast returners in both groups on average had higher enjoyment than slower returners ($N = 40$, $M_{fast} = 8.41$; $N= 44$, $M_{slow} = 7.70$, $p < .05$) and significantly higher partner liking as well ($M_{fast} = 8.55$, $M_{slow} = 7.83$, $p < .05$). Individuals generally returned faster when they enjoyed their interaction and liked their partner, but control group participants generally returned with conformity very near the mean time of return ($M = 133.6$ s, $SD = 35.3$) and the mindful group showed greater differentiation.

As regards simultaneity of return, fast mindful partners with the partners' average time of return < 140 s, did return more closely together in time. There was a significant difference ($t(20) = 2.57$, $p < .01$) in the mean simultaneity between fast and slow pairs within the mindful group ($N = 10$, $M_{fast} = 9.80$ s, $SD = 9.35$; $N = 12$, $M_{slow} = 31.2$ s, $SD = 24.8$). Such splitting was not significant within the control group ($N = 11$, $M_{fast} = 20.9$ s, $SD = 15.3$; $N = 8$, $M_{slow} = 30.0$ s, $SD = 43.5$). While fast returners are more likely to return with greater simultaneity due to the shorter total elapsed time, the fast mindful group partners still returned significantly closer together in time than the fast returners in the control group ($t(19) = 1.97$, $p < .05$), as listed in Table 4 ($M_{M+fast} = 9.80$ vs. $M_{M-fast} = 20.9$ s). This

supported the other observations of increased comfortableness, enjoyment, and aligned heart rate, and thus our model that many mindful returners who were well-matched on other variables would be more "in sync" with each other than untreated pairs.

Figure 3. Mindfulness enhances enjoyment and comfortableness. Mindful pairs show more enjoyment and comfortableness with each other than the control group after their decision to return. Time intervals: T1 (2.5 mins), T2 (7.5 mins), T3 (12.5 mins), T4 (second conversation 2.5 mins). Star denotes significant difference.

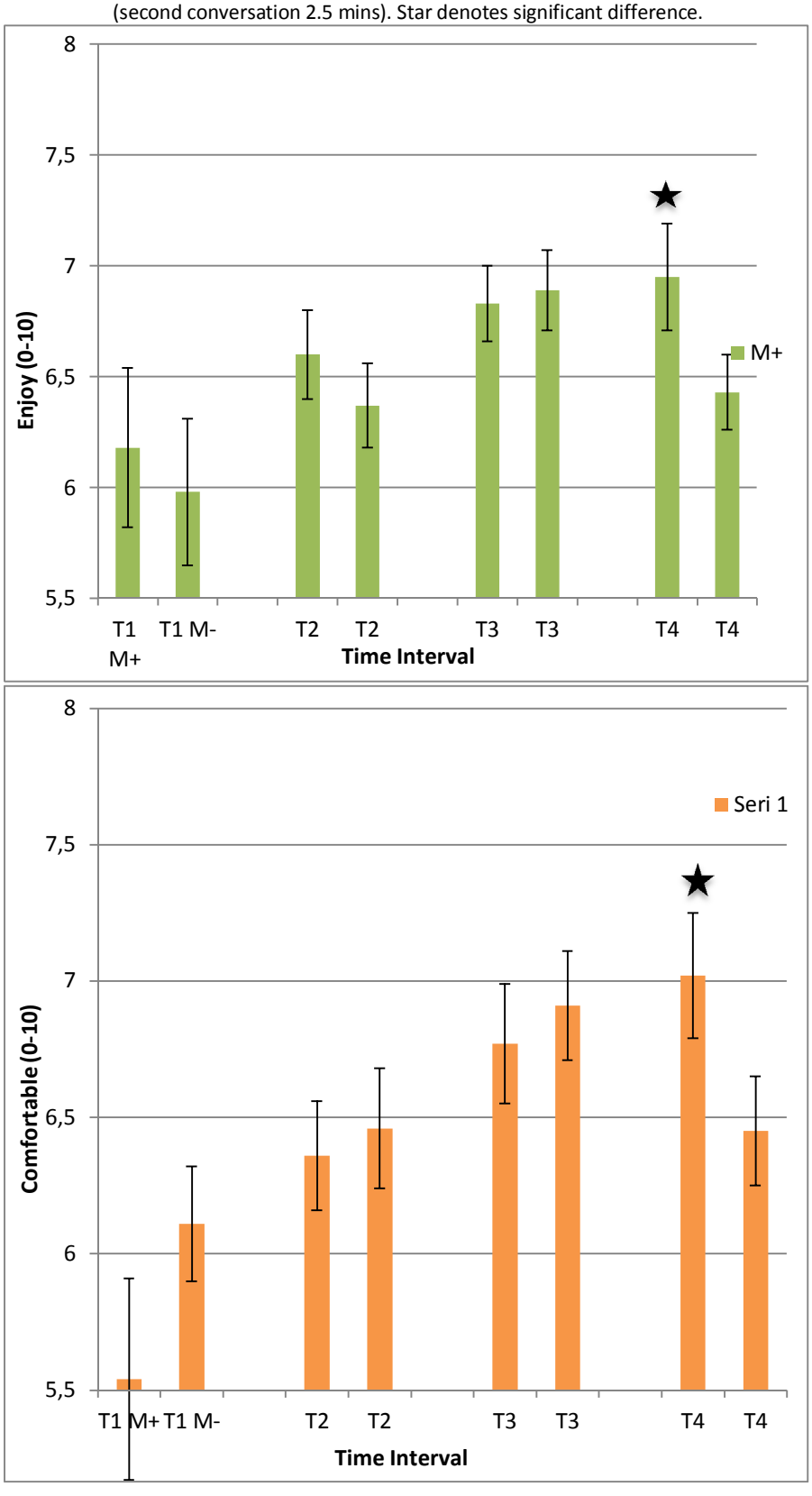


Table 4. Summary of Time of Return and Simultaneity

Group and Subgroup	Control	Mindful	Fast Control	Slow Control	Fast Mindful	Slow Mindful
Time of Return (s)	133.6 s[a]	164.8	115.7	158.3[a]	112.9	208.0
SD	(35.3)	(56.9)	(20.0)	(37.4)	(13.62)	(40.16)
N	38	44	22	16	20	24
Simultaneity (s)	24.7 s	21.5	20.9	30.0	9.80*	31.2
SD	(29.8)	(21.9)	(15.3)	(43.5)	(9.35)	(24.8)
N	19	22	11	8	10	12

Note. *p< .05 between mindful and control group.
[a] Not significantly different from mindful group when very slow returners included.

Additional planned analysis of cohorts was performed to examine the effects of age differences in pairings. A strong significant positive correlation was found in the control group between enjoyment and LMS for individuals in pairs with a large age difference of 5 years or greater ($r = .58$, $p < .05$), as listed in Table 2. In pairs with a smaller age difference of less than 5 years, the mindful treatment group showed a significant increase in enjoyment as a function of LMS ($r = .40$, $p < .05$). When trait mindfulness was sufficiently strong or when it was primed it appeared to increase enjoyment and may have facilitated "intergenerational attraction."

Discussion

Our hypothesis (H1) that mindfulness would generally increase interpersonal synchronicity was confirmed. It is important to emphasize that it was facilitated by regulation of the differentiation of timing in interpersonal coordination through improved decision-making. The simplified mindful treatment of noticing things about one's partner appeared to prime mindfulness in those inclined to be mindful. The evidence supported our expectations that this may have helped create small adjustments in attraction and synchronization because the experiment was designed to create an opportunity for intuitive decision-making after an initial conversation. After returning for the second conversation, the mindful group on the whole had increased enjoyment, comfort, and more closely matched heart rates. Many of the faster returners also exhibited signs of synchrony in their simultaneity.

In many cases when the mindful group partners enjoyed their initial conversation they returned faster and closer together. In other cases they returned slower, in agreement with their lower personal liking ratings of their partner. But control group pairs appeared to return in a mindlessly uniform and conforming way regardless of such preferences, and this may have increased tension after they returned. The lack of distinction making may have resulted in the control group's decreased enjoyment and comfortableness in the second conversation relative to the mindful group pairs who seemed to be making relatively well-coordinated and optimized decisions based upon things they noticed.

Trait mindfulness was sufficient to increase enjoyment for many individuals, for example in older pairs with high mindfulness. For others, the additional time before returning (~1 minute) may have allowed slower returners more personal time and space for processing or integrating their experiences to mitigate any negatively perceived factors. This could potentially be interpreted as a positive healthy decision-making response that minimizes the effects of suboptimal interpersonal matching or reduces the possibility of small traumas (Palm and Follette, 2011). The taking of additional time for self-reflection and attunement (Siegel, 2007) along with the other benefits of mindfulness may represent a mindful mechanism for regulating coordination dynamics. The instructions specifically asked participants to return when they "feel ready" so that they would have a choice and could make an intuitive decision that would be the most effective and make them happier. Indeed, this was the observed result in the mindful group as measured by their continued enjoyment and comfortableness upon returning and their closer matching of heart rate, when compared to the control group pairs who actually appeared to deteriorate.

While in general we expect mindfulness to always result in a more positive experience, which was observed by the objective raters as the experiment progressed, this result was not obtained in the self-reported ratings for the first part of the conversation. It may be that our

expectation was unreasonable for such a short conversation with this simplified mindful treatment, particularly with college students asked to perform an additional instruction, or that something else was going on. For example, the control group may have responded mindlessly to a demand characteristic where politeness dictates reporting conversations as pleasant unless there is good reason to do otherwise. The mindful group may have given a more varied, accurate, and authentic response. This interpretation was supported by the larger range of values in the mindful group and other unreported data analysis. For example, the data suggested that mindfully treated partners had a more accurate perception of how much their partner liked them and control group pairs more frequently responded with uniform ratings (all 10s, 9s, 8s, etc.).

Thus, at the end of the experiment, the mindful group had more apparent enjoyment, comfort, closer heart rates, and many pairs had increased simultaneity. The collective evidence supported our hypothesis that many partners would be "in sync." But this must assume they were reasonably well matched on a complex set of variables with a stranger at the outset of the experiment and had sufficient interpersonal rapport (Vacharkulksemsuk and Fredrickson, 2012). Those who were not as well matched on interpersonal liking may have returned slower and with less synchrony, although there could also be differences due to speed of filling out questionnaires, age, etc. However, we believe the distinctive decisions made by the mindful group were beneficial by increasing or decreasing alignment at times when being synchronized was not preferable, as most of the control group returned within a relatively narrow window centered around two minutes, even in cases when they may not have liked their partner. Mindlessly conforming behavior is not always optimal.

Certainly, at times it would be desirable to return quickly and experience more enjoyment in a rewarding interaction, but in other cases it is not advantageous to be highly synchronized. People must perform together in time, but perhaps not always at exactly the same interval when distinctions must be made that depend on context, personal preferences, etc. The mindful treatment appeared to increase overall levels of general interpersonal "synchronicity" and complementary beneficial behavior, and may have also decreased tension in pairs who were suboptimally matched by allowing for small changes in self-distancing behavior that also yielded a positive result. We therefore define interpersonal synchronicity as an increase in complementarily aligned behavior and beneficial cooperation that may at times require a decrease in automaticity (Bargh and Chartrand, 1999).

In conclusion, it is often desirable to have complementary aligned behavior and to be "in sync" with the other members of a group. An increase in this kind of special synchronicity was observed in many of the participants in the mindful group. The results suggest that mindfulness has the capacity to enhance relationships when it is desirable to be socially tuned with others (Lun *et al.,* 2007). Under conditions where there is sufficient time and space to make choices, mindfulness may facilitate improved decision-making about how and when to be in sync with others. It may also make people more comfortable with each other, as physiologically measured in closer heart rates. The results of this study demonstrate the potential power of mindfulness to aid interpersonal coordination dynamics and to achieve optimal timing in decisions to increase interpersonal synchronicity.

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