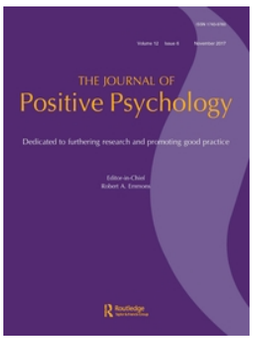

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Fun is more fun when others are involved

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ABSTRACT

Fun activities are commonly sought and highly desired yet their affective side has received little scrutiny. The present research investigated two features of fun in two daily diary studies and one laboratory experiment. First, we examined the affective state associated with fun experiences. Second, we investigated the social context of fun, considering whether shared fun is more enjoyable than solitary fun. Findings from these studies indicated that fun is associated with both high-activation and low-activation positive affects, and that it is enhanced when experienced with others (especially friends). However, social fun was associated with increases in high-activation but not low-activation positive affect, suggesting that social interaction emphasizes energizing affective experiences. We also found that loneliness moderated the latter effects, such that lonely individuals received a weaker boost from shared compared to solitary fun. These results add to what is known about the impact of social contexts on affective experience.

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Fun; affect; social interaction; emotion regulation

Fun is a popular goal. We often tell friends and acquaintances to 'have fun!' when they are about to go do something, and 'was it fun?' is frequently the first question asked afterwards. Popular media commonly highlight the idea of having fun, such as in Cyndi Lauper's pop song, 'Girls Just Wanna Have Fun', or Earhart's (1933) autobiography, 'The Fun of It', and many of us have taken family road trips with activity books that promise '100 Ways to Have Fun in a Car'. Presumably, people pursue fun because of the pleasant affective state that it involves, yet little research has explored the specific affective state(s) associated with having fun. For example, the word *fun* does not appear as an index term in any emotion or social-psychology textbook or handbook of which we are aware.

McManus and Furnham described fun as 'a complex phenomenon that has different meanings for different types of people' (McManus & Furnham, 2010, p. 159). This variability notwithstanding, the fun-seeking subscale of the Behavioral Activation Scale (Carver & White, 1994) characterizes fun-seeking in terms of impulsivity and the desire for novelty and excitement. Although neither explicitly defines the term, it seems reasonable to assume that most researchers would identify the affective state associated with fun as positively valenced, or as enjoyment of one's activity, potentially spanning affects that range from quiet joy to active elation. Thus, in the bivariate core affect model that guided our research (Russell, 2003; Russell & Barrett, 1999), fun would fall on the positive side of the valence dimension.

The research described in this article had two general purposes. First, in order to specify better the affective state that is associated with fun, we sought to locate fun on the two dimensions described by the core affect model, valence and arousal. Second, we aimed to examine the social context of fun, specifically to determine whether shared activities enhance the affective state associated with fun, compared to solitary experiences. To these ends, this article reports results from two experience sampling studies and one laboratory experiment.

Of what value is fun?

Relatively little research has investigated the consequences of fun. Prominent among the exceptions is research conducted in organizational settings, which has linked fun to workplace-relevant outcomes. For example, several studies have shown that experiencing fun at work, either in job-related activities or socializing with co-workers, positively predicts higher job satisfaction and lower employee burnout and turnover (e.g. Karl, Peluchette, & Hall, 2008; Karl, Peluchette, & Harland, 2007; Tews, Michel, & Allen, 2014; Tews, Michel, & Bartlett, 2012). Others, however, have noted more negative effects, arguing that workplace fun may be experienced as coercive or distracting, especially

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when time pressure is great (Baptiste, 2009; Fleming, 2005). Other areas in which fun has been associated with positive outcomes include learning (e.g. Cordova & Lepper, 1996) and marriage (Claxton & Perry-Jenkins, 2008).

Although these and related prior studies presume that fun is pleasant, they do not actually identify the specific affective state associated fun; in particular, they do not distinguish between high-activation and low-activation forms of positive affect, both of which might be considered fun (as we discuss below). Furthermore, this past work generally does not differentiate solitary fun, which is exclusively attributed to an activity, from social fun, which involves both the activity and its social context (Tews et al., 2014). The research reported in this article contributes to the debate about the value of fun by addressing these two questions.

For conceptual purposes, we distinguish fun from two other affect-related states that have received considerable attention. The first is flow, which Csikszentmihalyi (1990) described as a state of full absorption in an optimally challenging activity. Although flow is often experienced as joyful (Privette, 1983), many experiences that people routinely describe as fun do not involve the combination of high task demands and high skill utilization that is central to episodes of flow (Nakamura & Csikszentmihalyi, 2002) – for example, watching comedy on television, chatting with friends, or riding roller-coasters. The second point differentiates fun from happiness, a broader, more inclusive term that describes a variety of positive affective states, including, but not limited to, fun.

How is fun experienced?

One goal of this research was to identify the affective state that fun evokes in everyday life. The affective circumplex of the *core affect model* explains all affects in terms of a combination of two dimensions, hedonic valence (negative-positive) and level of arousal (low–high; e.g. Barrett & Russell, 1998; Feldman, 1995; Russell, 2003). It seems self-evident that fun is affectively positive. Less evident is whether fun would have a particular signature in terms of level of arousal. Prior models have suggested that related affective states such as interest, playfulness, and joy are undifferentiated (e.g. Ellsworth & Smith, 1988; Fredrickson, 1998). Nevertheless, from Carver and White's (1994) account of fun-seeking as an exciting activity, it might be expected that fun experiences are often highly arousing. However, many fun experiences are relatively low in activation – for example, avid readers commonly describe reading an absorbing novel as fun. We therefore treated the arousal level associated with fun as an exploratory question.

Rather than asking people to recall instances in which they had had fun, we relied on experience sampling for several reasons. First, we wanted to know how people feel when a fun experience actually occurs, rather than their personal recollections or theories of what fun entails. Experience sampling asks participants to record what they are doing and feeling at random moments during the day (Hektner, Schmidt, & Csikszentmihalyi, 2007), thereby avoiding biases that might be created by retrospection or by selecting exemplary events from memory (Schwarz, 2012). Second, we sought to test our hypotheses in the ecologically valid context of fun experiences that arise spontaneously during everyday life (Reis, Gable, & Maniaci, 2014). Third, experience sampling minimizes demand characteristics because the questions are embedded in surveys administered multiple times in a day (Reis et al., 2014).

This research was also designed to examine the social context of fun. Most contemporary theories agree that emotions serve important interpersonal functions, such as signaling others about one's internal states and goals, motivating approach and avoidance behaviors, and regulating interpersonal bonds (e.g. Baumeister & Leary, 1995; Izard, 1977; Zajonc, 1998). Somewhat rarer is research considering how emotional experiences are influenced by the social context in which those emotions arise. One exception is Gross and Thompson's (2007; see also Gross, 2015) model of emotion regulation, which describes how the actions of others can modify the nature and content of situations, thereby dampening, amplifying, or altering emotional experience and expression (cf. Boothby, Clark, & Bargh, 2014; Clark, Fitness, & Brissette, 2001). Rimé and colleagues have demonstrated that emotional sharing typically begets emotional experience on the part of the listener, as well as modifying the sharer's experience of emotion (see Rime, 2009 for a review). Yet, other models suggest that the nature of a relationship directly affects emotions experienced in that relationship (e.g. Berscheid & Ammazzalorso, 2001).

Prior research has established that the presence of others is associated with positive affect. A classic paper by Kraut and Johnston (1979) reported that bowlers were more likely to smile after a high score when looking at others than when facing the pins. This and other studies led the authors to conclude that social contexts were robustly related to social signals of affect, but erratically related to emotional experience itself. However, subsequent studies have found more consistent links between social circumstances and emotion. Clark and Watson (1988), for example, found that social interactions were consistently related to positive affect but not to negative affect. Other studies have shown that people see their social experiences as having greater emotional

impact than their solitary experiences (Jaremka, Gabriel, & Carvallo, 2011), are more likely to laugh when others are around (Provine & Fischer, 1989), and find their daily commutes more pleasant if they engage in casual conversation with strangers than if they travel without connecting with others (Epley & Schroeder, 2014). In the same conceptual vein, Caprariello and Reis (2013) found that experiential purchases are associated with higher levels of recollected happiness than material purchases in large part because the former are more likely to involve other persons.

None of this research, however, explicitly investigated fun. It is possible to form a hypothesis from theorizing about the interpersonal functions of positive affect. One function of positive affect is to foster social bonds – the 'build' component of Fredrickson's (1998) 'broaden-and-build' model. In essence, positive affects experienced during social interaction reinforce affiliative tendencies and increase partners' sense of connection with each other (Baumeister & Leary, 1995). As Fredrickson explains, 'shared experiences of positive emotion … create not only mutual enjoyment in the moment, but also enduring alliances' (1998, p. 311). For example, Fraley and Aron (2004) showed that humor enhanced closeness among strangers, and, in a short-term longitudinal study, Mauss et al. (2011) demonstrated that expressions of positive affect promoted feeling socially connected. This pattern may be particularly strong in the case of fun, which, as mentioned above, often produces a high arousal (energized) type of positive affect. Arousal enhances interpersonal attraction, as has been shown in several lines of research such as self-expansion theory (Dutton & Aron, 1974; see Aron, Lewandowski, Mashek, & Aron, 2013 for a review), excitation transfer theory (Zillmann, 1983), and studies of misattribution (Dutton & Aron, 1974; White, Fishbein, & Rutsein, 1981). If so, we expect that the reverse causal pattern would also hold: that fun would be experienced as more fun when others are involved than when it is solitary.

The present studies

This article reports three studies investigating the affective experience associated with fun. Our goal was to characterize these affects and to see how they were influenced by social contexts. As discussed above, we hypothesized that fun reports would be characterized by more positive and less negative affect than no fun reports; we had no specific hypothesis about how levels of activation would reflect fun. A second hypothesis was that reports of fun involving other persons would be more positive and less negative than reports of solitary fun.

The first two studies used experience sampling to examine affects associated with whatever fun experiences occurred during a three-day slice of ordinary life. Relying on two independent studies allows us to limit our conclusions to findings that are replicated. Because these studies were correlational, they could not establish a causal connection between the presence of others and fun. Study 3 therefore used an experimental design, with the aim of showing that the presence of other people causes an activity to be experienced as more fun than when it is enacted alone.

Method

Participants

Participants in Study 1 were 167 individuals (121 women) who resided in North America, recruited from the International Long QT Syndrome Registry, located in Rochester, NY. The sample ranged in age from 16 to 50 years (M = 34.39). Data from this study were previously reported in Lane, Zareba, Reis, Peterson, and Moss (2011); that paper did not examine fun ratings. Participants in Study 2 were 52 individuals (28 women) living in the Rochester, NY, and Tucson, AZ, metropolitan areas, ranging in age from 21 to 50 (M = 36.94). They were recruited by posted announcements and advertising in public media. Enrollment in both studies was limited to individuals who were fluent in English and who did not show signs of diminished cognitive capacity.

Procedure

Procedures in both studies were similar and are described conjointly, except where noted. Participants engaged in their normal everyday activities and were paged 10 times per day at random times. Study 1 used a Palm Pilot personal digital assistant (PDA), programmed to vibrate when a report was scheduled. Study 2 used Motorola Droid X or X2 smartphones, programmed to provide an auditory signal at the scheduled time. Surveys in both studies were administered directly on the devices. In Study 1, data were downloaded by a research assistant to a secure computer at the conclusion of the three-day interval. In Study 2, data were transmitted directly to a secure website by the phone.

EMA protocol

Participants were paged 10 times per day for 3 days. All signals were scheduled to occur in a 12-h window during the participant's usual waking hours, typically between 8 am and 10 pm. Signals used a modified random schedule

such that in Study 1, no two signals could occur within 60 min of each other; in Study 2, the minimum gap was 30 min. Participants in Study 1 were instructed to turn to their PDA as soon as possible after the page, to begin responding immediately, and to complete the protocol without interruption. In Study 2, to preserve the smartphone's battery, signals were sent at the 5-min marker immediately following the scheduled time (that is, at 8:05 if the signal was scheduled between 8:00 and 8:05, at 8:10 if the signal was scheduled between 8:05 and 8:10, and so on). Participants were instructed to begin responding as soon as they heard the signal, and to complete the survey without interruption. In Study 2, the smartphone did not permit responses after 20 min from when the signal was delivered.

Compliance with the EMA protocol was computed by comparing the scheduled time of the signal to the recording device's internal record of when recording began. Subjects responded to 93.0 and 91.6% of the pages sent in Studies 1 and 2, respectively. Of these, 62.5%/83.3%, 84.0%/93.6%, 92.2%/95.0%, 95.5%/97.3%, and 96.9%/100% were begun within 1, 5, 10, 15, and 20 min after the page in Studies 1 and 2, respectively. When we computed the percentage of reports begun within 15 min of the page separately for each participant, the median compliance rate was 98.3% in Study 1 and 93.3% in Study 2. More than half the sample in both studies began all or all but one of their reports within 10 min, and only 19 participants in Study 1 and 2 participants in Study 2 began 4 or more reports more than 15 min after the page. On average, it took Study 1 participants 2.35 ± 1.36 min and Study 2 participants 4.00 ± 3.50 min to complete the EMA protocol.

EMA content

Participants in both studies were presented with a yes–no question, asking them to indicate if they had 'done anything fun or enjoyable' since the previous signal.[1] If they replied yes, they were asked to rate the degree of enjoyability on a 1 (slight) to 6 (extreme) scale. They were also asked to indicate whether or not another person was involved.

Study 1 began with a subset of 22 emotion items from the expanded Positive and Negative Affect Scale (PANAS-X; Watson, Clark & Tellegen, 1988). To minimize participant burden, based on past psychometric studies, we preselected a subset of 22 items for the current study: (1) Activated Positive Affect: interested, attentive, excited (in a positive way), enthusiastic, alert, happy, and amused (α = 0.85); (2) Activated Negative Affect: guilty, anxious, angry, hostile, jittery, and afraid (α = 0.70); (3) Low Arousal Positive Affect: calm, relaxed, hopeful, and grateful (α = 0.73), and (4) Low Arousal Negative Affect: sad, depressed (substituted for the PANAS-X term, blue), lonely, bored, and sleepy (α = 0.57). All adjectives were assigned to a composite based on Watson and Clark's psychometric studies, which have been extensively replicated. Study 2 began with the same composites, but in order to increase the breadth and reliability of the low arousal composites, a few emotion terms were added to the above. The composites thus were: (1) Activated Positive Affect: interested, attentive, excited (in a positive way), enthusiastic, alert, and happy (α = 0.83); (2) Activated Negative Affect: guilty, anxious, angry, hostile, jittery, and afraid (α = 0.85); (3) Low Arousal Positive Affect: calm, relaxed, peaceful, at ease, hopeful, content, and grateful (α = 0.89), and (4) Low Arousal Negative Affect: sad, depressed, lonely, sluggish, bored, disappointed, and sleepy (α = 0.87). Thus, the composites in Study 2 were based on 26 emotion items. Items were presented in the same random order in both studies.

Results

A two-level multilevel linear model was used to analyze the data (HLM version 6.06; Raudenbush, Bryk, & Congdon, 2004). At level 2 participants' slopes and intercepts were modeled to account for the non-independence inherent in within-person designs. At level 1, planned contrasts and control variables were entered. All analyses controlled for the day of the week (weekdays vs. weekends) and the time of day (signal 1–10). We examined the effects of social and solitary fun using two planned contrasts. Contrast 1 (C1) compared signals in which people reported having had fun since the last signal with signals in which they did not report having had fun. Contrast 2 (C2) compared signals in which people had fun with others to signals in which people had fun alone. C1 and C2 were centered on each person's mean. When an affect composite was the outcome variable, affect at the prior signal ($t - 1$) was controlled in the model (also centered on person means). Intercepts were modeled using random effects, while all other effects were modeled using fixed effects, as is commonly recommended for diary designs (Kenny, Bolger, & Kashy, 1998). Missing data were accounted for using full maximum likelihood estimation.

Reports of fun

Participants in Study 1 indicated having had fun since the previous signal in 45.1% of their reports. This percentage varied from 0 to 93.3% across participants. On average, 79.9% of the reports of fun involved another person. In Study 2, participants indicated having had fun in 31.2% of their reports, varying again from 0 to 93.3% across participants. On average, 61.2% of the reports of fun involved another person.

Table 1. Means and standard deviations for Fun conditions in Studies 1 and 2.

	No fun	Fun alone	Fun with others
Study 1			
Level of fun reported	–	2.75[a]	3.20[b]
		(0.67)	(0.95)
Activated positive affect	2.91[a]	3.27[b]	3.55[c]
	(0.68)	(0.61)	(0.75)
Activated negative affect	1.46[a]	1.34[b]	1.31[b]
	(0.42)	(0.26)	(0.29)
Low arousal positive affect	2.88[a]	3.19[b]	3.28[b]
	(0.70)	(0.59)	(0.70)
Low arousal negative affect	1.51[a]	1.43[b]	1.33[c]
	(0.39)	(0.31)	(0.29)
Study 2			
Level of fun reported	–	2.96[a]	3.64[b]
		(0.77)	(0.79)
Activated positive affect	3.19[a]	3.48[b]	3.90[c]
	(0.64)	(0.45)	(0.61)
Activated negative affect	1.45[a]	1.28[b]	1.31[b]
	(0.38)	(0.18)	(0.22)
Low arousal positive affect	3.30[a]	3.76[b]	3.91[b]
	(0.71)	(0.51)	(0.60)
Low arousal negative affect	1.57[a]	1.51[b]	1.42[c]
	(0.43)	(0.24)	(0.23)

Note: [a–c]Means sharing a superscript do not differ significantly from each other at $p<.05$.

We first examined the level of fun reported (for which contrast 1 was necessarily omitted) as a function of whether it occurred alone or with others. As hypothesized, participants in both studies reported having had more fun with others than alone (Study 1, $B = 0.23$, $p < 0.001$; Study 2, $B = 0.24$, $p = 0.002$). Means and standard deviations are reported in Table 1; standard errors, *t*-values, and confidence intervals are given in Table 2.

Analyses of momentary affective states

We next examined effects for the four affective-state composite variables. For contrast 1, all four results were significant. Participants experienced more activated ($B = 0.17$, $p < 0.001$) and low arousal positive affect ($B = 0.12$, $p < 0.001$) and less activated ($B = -0.04$, $p < 0.001$) and low arousal negative affect ($B = -0.04$, $p < 0.001$) when they had fun compared to when they did not have fun. As for contrast 2, participants experienced more activated positive affect when they had fun with others ($B = 0.14$, $p < 0.001$), but not more low arousal positive affect ($B = 0.03$, $p = 0.25$). Also, when they had fun with others, participants experienced significantly less low arousal negative affect, ($B = -0.04$, $p = 0.04$), but not less activated negative affect ($B = 0.001$, $p = 0.75$). In short, social fun amplified high arousal positive affect and dampened low arousal negative affect relative to solitary fun, but had no significant effect on low-arousal positive affect or activated negative affect.[2]

In Study 2, participants also reported more activated ($B = 0.14$, $p < 0.001$) and low arousal positive affect ($B = 0.12$, $p < 0.001$) and less activated ($B = -0.03$, $p = 0.01$) and low arousal negative affect ($B = -0.04$, $p = 0.004$) when they reported having had fun since the last signal. Also as in Study 1, they reported more activated positive affect when having fun with others ($B = 0.14$, $p = 0.004$), but not more low arousal positive affect ($B = 0.02$, $p = 0.67$). Participants also reported significantly less low arousal negative affect when having fun with others ($B = -0.05$, $p = 0.02$), but not less activated negative affect ($B = -0.02$, $p = 0.44$). These results replicate the pattern found in Study 1.[3]

Brief discussion and introduction to Study 3

In both Studies 1 and 2, as hypothesized, fun was associated with higher levels of positive affect and lower levels of negative affect. This was true for both high-arousal and low-arousal affects. Also as hypothesized, social fun was associated with significantly higher levels of activated positive affect and significantly lower levels of low-arousal negative affect than solitary fun. We defer discussion of these findings to the general discussion.

Study 3 was designed with four purposes in mind. First, it is plausible that participants in Studies 1 and 2 were engaging in different activities when having fun with others as opposed to when having fun alone. In order to establish that the presence of others is responsible for the increase in reports of fun, we had participants in Study 3 engage in the same enjoyable activity alone or with others. Second, because Studies 1 and 2 were correlational, a reverse causal order is possible; that is, engaging in fun activities may have led participants to seek out others. By manipulating the presence or absence of others, we directly tested the hypothesis that a social context increases the experience of fun.

Third, we also wanted to determine whether familiarity with one's social partner matters. It seems likely that most of the shared fun in Studies 1 and 2 occurred with familiar others. Prior research has shown that familiarity enhances comfort and satisfaction in social interaction, factors that might be expected to relate to the experience of fun (Reis, Maniaci, Caprariello, Eastwick, & Finkel, 2011). Furthermore, laughter that occurs immediately following a partner's laughter is more common when the partner is a friend than a stranger (Smoski & Bachorowski, 2003). Study 3 therefore included a manipulation of the degree of acquaintance between participants.

Finally, in Study 3 we also examined whether loneliness would moderate the impact of social context on fun ratings. Previous research has suggested that loneliness is less a matter of spending time alone and more a matter of not experiencing a gain in positive emotions from social activity (Hawkley, Burleson, Berntson, & Cacioppo, 2003; Queen, Stawski, Ryan, & Smith, 2014). Also, prior research indicates that whereas lonely individuals find their interactions with close others to be less rewarding

Table 2. Summary and inferential statistics for Studies 1 and 2.

	B	SE	*t*	*p*	95% CI
Study 1					
Level of fun reported					
C2: Solitary vs. Social	0.23	0.04	$t(1912) = 6.43$	<0.001	{0.15, 0.31}
Activated positive affect					
C1: Fun vs. No Fun	0.17	0.01	$t(3868) = 13.62$	<0.001	{0.15, 0.19}
C2: Solitary vs. Social	0.14	0.03	$t(3868) = 5.09$	<0.001	{0.08, 0.20}
Activated negative affect					
C1: Fun vs. No fun	−0.04	0.01	$t(3868) = -5.34$	<0.001	{−0.06, −0.02}
C2: Solitary vs. Social	0.001	0.02	$t(3868) = -0.33$	=0.75	{−0.04, 0.04}
Low arousal positive affect					
C1: Fun vs. No Fun	0.12	0.01	$t(3867) = 9.53$	<0.001	{0.10, 0.14}
C2: Solitary vs. Social	0.03	0.03	$t(3867) = 1.15$	=0.25	{−0.03, 0.09}
Low arousal negative affect					
C1: Fun vs. No Fun	−0.04	0.01	$t(3867) = -4.88$	<0.001	{−0.06, −0.02}
C2: Solitary vs. Social	−0.04	0.02	$t(3867) = -2.09$	=0.04	{−0.08, −0.001}
Study 2	*B*	SE	*t*	*p*	CI
Level of fun reported					
C2: Solitary vs. Social	0.24	0.08	$t(433) = 3.21$	=0.002	{0.08, 0.40}
Activated positive affect					
C1: Fun vs. No Fun	0.14	0.02	$t(1167) = 7.07$	<0.001	{0.10, 0.18}
C2: Solitary vs. Social	0.14	0.05	$t(1167) = 2.91$	=0.004	{0.04, 0.24}
Activated negative affect					
C1: Fun vs. No Fun	−0.03	0.01	$t(1167) = -2.51$	=0.01	{−0.05, −0.01}
C2: Solitary vs. Social	−0.02	0.02	$t(1167) = -0.77$	=0.44	{−0.06, 0.02}
Low arousal positive affect					
C1: Fun vs. No Fun	0.12	0.02	$t(1167) = 5.40$	<0.001	{0.08, 0.16}
C2: Solitary vs. Social	0.02	0.05	$t(1167) = 0.43$	=0.67	{−0.08, 0.12}
Low arousal negative affect					
C1: Fun vs. No Fun	−0.04	0.01	$t(1167) = -2.96$	=0.004	{−0.06, −0.02}
C2: Solitary vs. Social	−0.05	0.02	$t(1167) = -2.31$	=0.02	{−0.09, −0.01}

than non-lonely individuals do, fewer differences exist in interactions with acquaintances and strangers (e.g. Tsai & Reis, 2009; Williams & Solano, 1983). If so, we would expect that sharing a fun experience with a friend would provide less of a boost in fun ratings among lonely persons than among non-lonely persons, but that there would be no differences when playing with a stranger.

Study 3 was a three-condition experiment in which participants played Jenga® alone, with a same-sex friend, or with a same-sex stranger. Jenga® is a game that involves increasing the height of a block tower by successively removing lower tier pieces until the tower inevitably collapses. We chose this game because undergraduates typically find it enjoyable because it can be played equally effectively alone or with others, and because it seemed well-suited to being played similarly regardless of whether players were previously acquainted with one another.

Method

Participants

Two-hundred and sixty-three undergraduates (201 female, 62 male) were recruited through the psychology department participant pool. Their average age was 19.9 years (range = 18–23) and the majority of participants were Caucasian (61.4% Caucasian, 29.0% Asian, 5.4% African-American, 2.3% mixed race, and 1.9% other).

Procedure

This study consisted of two parts: an online survey and a lab session. Participants completed the online survey before coming to the lab. This survey included demographic information and a measure of the potential moderator, loneliness. At the end of the survey, participants were randomly assigned to a condition. Some were asked only to sign up for the lab session, in which case they would participate either alone or with a stranger, while others were asked to sign up and bring a same-sex friend with them to the lab. (If the friend was also enrolled in the department participant pool, he or she received credit for participation.) All participants took part in the condition to which they had been initially and randomly assigned. By chance, three stranger pairs happened to know each other before coming to the lab; their data were dropped, leaving 257 participants.

In Jenga®, blocks are stacked in layers, three per layer, to form a tower. Players take turns removing blocks and placing them on top of the tower, with the goal of building the tallest tower possible without it falling over. The experimenter asked participants whether or not they had played the game before; 76% of participants were familiar with the game. All participants were given brief instructions on how to play, but if one or more of them had never played the game before the experimenter also gave a demonstration. Participants were told they would have 15 min to play and if their first tower fell before 15 min had passed, they would be able to build another one.[4] The experimenter also explained that task was meant to be fun and encouraged participants to do whatever they needed to do in order to enjoy their experience. The experimenter stayed in the room but did not interact with the participants while they played the game. This was done to ensure that participants stayed on task and to permit the experimenter to surreptitiously take notes on how long participants spent building each tower.

After the task was completed, participants completed a final survey in which they were asked how much fun they had playing Jenga®.

Measures

UCLA Loneliness Scale (Russell, 1996)

Participants responded to 20 items in which they were asked to indicate on four-point Likert scales, ranging from never to always, how often they had experiences indicative of loneliness, like feeling 'alone' or 'that there is no one you can turn to'. Cronbach's α for our sample was 0.93.

Fun ratings

On a six-point Likert scale, with endpoints labeled 'slightly' and 'extremely', participants were asked, 'How much fun did you have playing Jenga?'

Results

Because it might reasonably be expected that two people playing a game together would influence each other's reports of having fun, we analyzed Study 3's data with a multilevel model, as in Studies 1 and 2. In this instance, there were two scores at level 1, namely the reports of fun provided by each partner. In the alone condition, there was only one score at level 1. This approach accounts for dependence in the friend and stranger conditions (in fact, the correlation between partners' reports of fun was 0.26, $p = 0.08$, in the friend condition and 0.29, $p = 0.05$, in the stranger condition; these two values do not differ significantly). As before, the first contrast compared fun ratings in the alone condition with the two social conditions. The second contrast compared fun ratings in the friends and stranger conditions. Both contrasts were included simultaneously in the same analysis.

Both contrasts yielded significant results, as shown in Table 3. Participants reported having had significantly less fun when alone ($M = 3.89$) than when with another person ($M = 4.33$), $B = 0.15$, $p = 0.002$. Also, participants reported having had significantly more fun with a friend ($M = 4.55$) than with a stranger ($M = 4.11$), $B = 0.22$, $p = 0.003$. Thus, results were consistent with our hypothesis.

To examine potential moderator effects of loneliness, we included each participant's loneliness score as a level-1 predictor and interactions between loneliness and the two contrasts as level-2 predictors.[5] The main effect for loneliness was not significant, $B = -0.15$, $p = 0.19$. However, this analysis revealed a significant interaction between loneliness and the second contrast (comparing friends with strangers), $B = -0.29$, $p = 0.03$. In order to identify this interaction effect, we computed simple slopes using the procedure outlined by Aiken and West (1991), which sequentially allows each group to serve as the reference group in a dummy variable coding scheme. As shown in Figure 1, this analysis revealed a significant simple slope

Table 3. Descriptive statistics and tests in Study 3.

	Alone		Stranger		Friend
Level of fun reported	3.89 (0.93)		4.11 (0.96)		4.55 (0.84)
Hypothesized contrasts					
	B	SE	*t*	*p*	95% CI
C1: Alone vs. Social	0.15	0.05	$t(253) = 3.18$	=0.002	{0.05 to 0.25}
C2: Stranger vs. Friend	0.22	0.07	$t(253) = 3.04$	=0.003	{0.08 to 0.36}
Interactions and simple slopes involving loneliness					
Loneliness	−0.15	0.12	$t(246) = -1.32$	=0.19	{−0.39 to 0.09}
C1 × Loneliness	−0.09	0.09	$t(246) = -1.03$	=0.30	{−0.27 to 0.08}
C2 × Loneliness	−0.29	0.13	$t(246) = -2.22$	=0.03	{−0.55 to −0.03}
Simple slopes					
Alone	0.03	0.23	$t(246) = 0.13$	=0.90	{−0.43 to 0.49}
Stranger	0.04	0.20	$t(246) = 0.21$	=0.84	{−0.34 to 0.43}
Friend	−0.53	0.17	$t(246) = -3.22$	=0.002	{−0.86 to −0.20}

Note: The top row reports means above standard deviations (in parentheses).

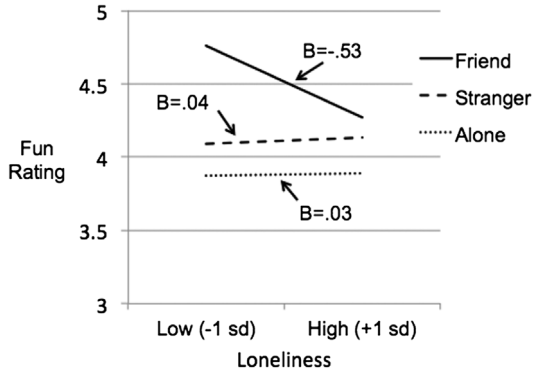

Figure 1. Moderation of the loneliness–fun association by condition.

for loneliness in the friend condition, $B = -0.53$, $p = 0.002$, indicating that the higher one's level of loneliness, the less fun participants had playing Jenga with a friend. However, the simple slope indicated that loneliness was not significantly related to fun ratings in the stranger condition, $B = 0.04$, $p = 0.84$. For reference purposes, we also note that loneliness was not significantly related to fun ratings in the alone condition, $B = 0.03$, $p = 0.90$.

Discussion

This research supports three general conclusions concerning affective states associated with fun. First, we found support for our hypothesis that fun yields a broadly positive affective experience, spanning both activated and low-arousal forms of positive affect. This finding indicates that rather than being located in a specific region on the core affect model, the affective outcome of fun may fall anywhere on the positively valenced side of this model. In other words, the affective repercussions of fun experiences extend to both high arousal and low arousal positive affects.

Second, as hypothesized, we found that fun experienced when interacting with others is more positive than solitary fun, further evidence for a link between positive affect (especially in the context of fun) and social bonds (Fredrickson, 1998), as well as for the broader outcome value of fun. This result was obtained for activated, but not for low-arousal, forms of positive affect, indicating that others play a role in increasing activation and arousal associated with positive affect. Prior research has shown that arousal can heighten attraction (Dutton & Aron, 1974) and that positive feedback influences judgments primarily when it is activating (Clark, Milberg, & Ross, 1983) but this is the first research to show that the presence of others is specifically associated with higher levels of activated positive affect. We propose that the presence of others may be intrinsically activating, as interaction itself requires sequences of action and response that are generally arousing rather than calming (especially in the context of fun). Alternatively, others may provide social signals of fun and enjoyment, which reinforce the individual's own affective experience in the manner of emotional contagion (Hatfield & Cacioppo, 1994; Rime, 2009; see also Boothby et al., 2014). Either way, our results suggest that the social context is particularly likely to boost positively activated emotions. It is important to note that this effect of social contexts can be considered causal because Study 3 demonstrated that participants reported greater fun when they were randomly assigned to engage in the same enjoyable activity with others than when alone.

Third, we found that social fun was greater when interacting with a friend than with a stranger. Familiarity is known to increase comfort and satisfaction in social interaction (Reis et al., 2011), whereas interacting with a new acquaintance for the first time is likely to make people feel at least somewhat tentative, factors that seem likely to influence how much fun people can have playing a game during a laboratory experiment. This tendency was observed only among relatively non-lonely individuals; among lonely persons, playing with a friend produced essentially no benefit compared to playing with a stranger. Although the familiarity-satisfaction association is well-documented in the literature, this is the first study of which we are aware to demonstrate moderation of this link by an individual difference variable. However, the finding dovetails well with other research suggesting that the central characteristic of trait loneliness is the relative lack of intimacy and enjoyment in interactions with friends than non-lonely people experience (e.g. Hawkley et al., 2003; Tsai & Reis, 2009). Consistent with this proposition, Cacioppo, Norris, Decety, Monteleone, and Nusbaum (2009) demonstrated that lonely individuals show weaker activation of reward-related regions of the brain in response to pictures of people as compared to pictures of objects, whereas non-lonely persons showed the opposite pattern. In other words, trait loneliness may reflect an inability to derive emotional benefits from the kinds of interactions and relationships that tend to be rewarding to non-lonely persons.

On a more general level, this research contributes additional evidence to Clark et al.'s (2001) thesis that social contexts influence emotional experience – that is, that the nature of a person's relationships with others who are socially present will affect the way in which emotion is experienced and expressed. This idea is part of a broader theme proposed by Reis, Collins, and Berscheid (2000), who review diverse evidence indicating that many of the phenomena studied in psychological science vary depending on whom one is with or thinking about. Their review suggests that full understanding of psychological

phenomena requires incorporating the influence of the social context in which that behavior typically occurs. The present research fits well with that theme, and with the more general goal of more fully incorporating social contexts into the study of emotion (Gross & Thompson, 2007).

Limitations and suggestions for future research

Several limitations apply to this research. First, Studies 1 and 2 did not control for the nature of participants' activities, and it is possible that solitary fun activities differed from social fun activities. For example, solitary fun may involve relatively more passive pursuits, such as reading and browsing the Internet, whereas social fun tends to be more active. Study 3 helps address this limitation to some extent, but it examined only a single activity. Another limitation is that although the protocol for Studies 1 and 2 asked whether something fun had occurred 'since the prior signal' (an interval that on average spanned about an hour and a quarter), affect was rated for the moment of the signal. It is unknown whether ratings made during the fun experience would yield the same results. However, our results can be taken to indicate that fun has temporally durable effects on affect, a valuable point in its own right. Another possibility is that some of the adjectives we used might, under different circumstances, switch from being high activation to low activation, or vice versa. (Given the extensive psychometric work that went into the measures from which our instrument was adapted, this seems likely to be relatively rare.) A final consideration is that these studies examined only subjective reports of fun. Experiencing an activity as fun is of course inherently subjective; however, fun, especially social fun, might be expected to have behavioral manifestations (e.g. smiling, laughter, postural approach), and it would be valuable to extend our findings with such data.

Future research might profitably examine the high-activation/low-activation distinction as it pertains to the outcome value of fun. Although we found that both types of positive emotions were more common when people were having fun, social fun was predominantly of the high-activation sort. It is possible that activation differences may help explain when fun produces beneficial outcomes and when it does not (such as in the workplace). Our findings also suggest that potential benefits of fun occur primarily in social, rather than solitary, contexts, consistent with Tews et al.'s (2014) finding that work-related benefits of fun were more a function of workplace relationships than the activities themselves. This speculation needs direct empirical investigation. It may also be fruitful to conduct research examining how the nature of shared enjoyable interaction influences the development and maintenance of relationships – for example, does shared fun benefit relationships in the same manner that novel, arousing activities do (Aron et al., 2013), and do these benefits extend beyond romantic relationships to other kinds of relationships, such as between friends or parents and their children.

Conclusion

People are motivated to pursue fun activities because these activities commonly result in a broadly positive affective experience. As enjoyable as fun activities may be in their own right, shared fun is more fun than solitary fun, particularly when the sharing involves a friend. Fun therefore deserves more serious scrutiny as something more than a reflection of the enjoyability of an activity or moment in time: it yields an affective state that is linked to developing and reinforcing important social bonds. The neobehaviorist Edward Chace Tolman is renowned for summing up his career by stating, 'In the end the only sure criteria is to have fun. And I have had fun'. (Tolman, 1959, p. 140). Perhaps he was referring not only to the joy of scientific discovery but also to the pleasure of sharing that pursuit with others.

Notes

1. Because experience sampling necessarily requires random sampling of moments during the day, the ratings we obtained may not be simultaneous with the actual fun experience but rather likely occurred shortly afterwards. This suggests that our findings are best interpreted in terms of the short-term durable affects associated with fun, a perspective that is consistent with our theorizing.
2. Gender was considered as a potential moderator of these effects. One significant interaction emerged in Study 1: a significant contrast 1 x gender interaction on activated negative affect (B = 0.04, SE = 0.02, $t(3862)$ = 2.10, p = 0.04, 95% CI = {0.001, 0.08}), such that men experienced a relatively greater decrease in negative affect as a function of fun than women did (for men, means = 1.41 and 1.60; for women, means = 1.29 and 1.40, in the Fun and No Fun conditions, respectively. Simple effects indicated that the difference was significant for both sexes (among men, B = –0.07, SE = 0.02, $t(3862)$ = –4.07, p < 0.001, 95% CI = {–0.11, –0.03}; among women, B = –0.03, SE = 0.01, $t(3862)$=–3.73, p < 0.001, 95% CI = {–0.05, –0.01}).
3. In Study 2, only one significant interaction with gender emerged, for contrast 2 on activated positive affect, B = 0.19, SE = 0.09, $t(1161)$ = 2.14, p = 0.03, 95% CI = {0.01, 0.37}). Women experienced more activated positive affect when having fun with others compared to having fun alone, whereas this difference was not significant for men (among women, Ms = 3.97 and 3.51; B = 0.23, SE = 0.06, $t(1161)$ = 3.64, p = 0.001, 95% CI = {0.11, 0.35}; among men, Ms = 4.00 and 3.91; B = 0.04, SE = 0.06, $t(1161)$=0.63, p = 0.53, 95% CI = {–0.08, 0.16}). Note that the gender interactions are inconsistent across Studies 1 and 2, suggesting that they may be due to chance.

4. Across conditions, participants playing built 1.84 towers, those playing with a friend built 1.88 towers, and those playing with a stranger built 2.10 towers. These values do not differ significantly.
5. Four participants did not complete the UCLA Loneliness Scale and were excluded from this analysis.

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