



## Expanding Our Kind: A Pan-Cultural Study of the Animistic Principle of Ontological Parity

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Conducted in four societies—Taiwan, India, Mainland China, and the United States—this pan-cultural study extended and replicated a previous finding, with Iranian samples, of the possibility and benefits of expanding our “kind” via priming. The mechanism behind this phenomenon is explained through the principle of ontological parity. Derived from animism as articulated in Chinese folk beliefs, ontological parity refers to perceived sameness in being, a quality that is believed to be expandable. This formulation broadens the conceptual scope of intimacy thereby allow for novel hypothesis testing. It was predicted and found that experimentally expanding ontological parity to nonhuman and nonliving elements of nature was associated with increase in relational solitude, and decrease in negative emotions, especially anger and fear. Far-reaching implications of this investigation, ranging from the possibility of intimacy in solitude to morality and the human machine interface, are discussed.

**Keywords:** intimacy, animism, morality, mind perception, human machine interface

The landscape of our relationships is deformed under the strain of prolonged social distancing in the wake of the COVID-19 pandemic. This deformed landscape of relationship witnesses a surge of alternative forms of intimacy, ranging from increase in adoption of pets and sales of drug and alcohol, to the overconsumption of technologies of connectivity. It is time that we rethink intimacy.

To rethink intimacy, this investigation takes three steps. First, we derive from animism, as found in Chinese folk beliefs, a foundational principle of intimate relationships: namely,

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the principle of ontological parity. Defined as perceived sameness in being or essence, ontological parity is expandable in animism beyond not only the social arena, but also the conventional boundaries of the human and nonhuman. This hypothesis of expandable ontological parity is tested via priming in the next step. A pan-cultural study of four samples, from Taiwan, India, the United States, and Mainland China was conducted to extend and replicate a previous study with Iranian samples (Sundararajan & Fatemi, 2016a, 2016b). As predicted, priming the expansion of parity-based relation to nonhuman and nonliving elements in nature is not only possible but also beneficial, as evidenced by increased experiences of intimacy—with both self and others—in solitude, and decreased negative emotions, especially anger and fear. In the third and last step, we discuss the far-reaching implications of this study for intimacy in a wide variety of contexts, ranging from feeling connected when alone, and feeling connected with all at the global and cosmic level, to issues of intimacy in the human machine interface.

## The Principle of Ontological Parity

Perceived sameness in being or essence plays a pivotal role in the sympathetic magic of like attracts like, otherwise known as animism (Sundararajan, 2009). As the expression “like attracts like” suggests, what tends to happen after perceived kinship (sameness in being) is felt closeness or intimacy. This idea is further elaborated in the ancient Chinese notion of *gan-lei* (Goldberg, 1998), which posits that similarity in kind (*lei*) is the necessary condition for affective responsiveness (*gan*) between things. It is said in the *I-Ching*: “Things that accord in tone vibrate together. Things that have affinity in their inmost natures seek one another. Water flows to what is wet, fire turns to what is dry . . .” (Munakata, 1983, p. 106). Another ancient text *Lieh nü chuan* puts it this way: “When an ox lows and a horse makes no response, it is not because the horse does not hear the noise; it is because it belongs to another species” (cited in Henry, 1987, p. 27). In a phrase, birds of a feather flock together. For humans this means that our affective relatedness hinges on the ontological question: what constitutes my kind? To this question, animism has a unique answer.

Animism attests to a tendency for humans to see their being as expandable, because the human “kind” is not a fixed category. This notion is captured by the Chinese concept of *gan-lei* (responsiveness in kind), which is explained by the Buddhist thinker Yan-Zhi Yan (384–456) as follows: “Things do not interact at random; they are responsive [*gan*] to each other according to categorical correlations [*lei*]. Of all the things, the human heart/mind has the greatest capacity for responsiveness in kind [*gan-lei*]” (cited in Seng Yu, 1929, p. 23b).

Yan’s statements underscore two interrelated themes of animism: first, humans share with other animals a capacity for responsiveness in kind. Second, humans are capable of responding to a wide variety of things, because their kind is not genetically fixed as it is with other animals. Thus extending our kinship and closeness to things in the world beyond conventional categories is a characteristically human propensity. Indeed, expandable ontological parity is well documented in the lore of many ancient Chinese artists who found kinship and closeness with trees, rocks, and stones (Rowley, 1974). In psychology, Johnson et al. (2015) have also found a universal tendency to perceive kinship and closeness to nonliving and non-human objects. In the following analysis, the principle of ontological parity is further unpacked.

## Parity Versus Property

In very general terms, ontological parity can be formulated as  $x = y$ , where  $x$  = (being or essence of) self;  $y$  = (being or essence of) other. This allows a distinction to be drawn between

parity (perceived sameness in being) and property (subject vs. object disparity in being). The parity versus property distinction can be formulated as follows: if  $x = y$ , then the entity is perceived as a person just like me, whereas if  $x \neq y$ , then the entity would be perceived as a thing, not a person like me.

The parity versus property distinction is applicable to the following episode of mutual gazing with a mountain, as reported by the Tang poet Li Po (701–762):

Never tired of looking at each other—

Only the Ching-t'ing Mountain and me. (Liu & Lo, 1975, p. 110)

In direct contradistinction to our conventional subject to object transactions with the world, Li Po's mountain is endowed with the following attributes that Johnson et al. (2015, p. 296) deemed necessary for perceived personhood:

- kinship—"the Ching-t'ing Mountain and me" are two of a kind;
- essence—the mountain has a mind with similar desires and predilections as the poet's;
- sociability—the mountain's alleged capacity for mutual gazing entails an essential component of meaningful mental connection, known as interpersonal synchrony (Wheatley et al., 2012).

The parity versus property distinction is also applicable to self-to-self relation. To the extent that, as Ricoeur (1994) points out, the self relates to itself as an other, the self-to-self relation can be formulated as follows: If  $x =$  (being or essence of) I;  $y =$  (being or essence of) me, then parity would be  $x = y$ , where there is a symmetrical relationship such as I being "in touch with my 'true self'" (Sedikides et al., 2017, p. 522). Property by contrast may be formulated as  $x \neq y$ , where there is the asymmetrical, subject versus object, relationship between, for instance an evaluating I and the scrutinized me. For illustration, we turn to two different interpretations of a well-known Confucian passage known as "shendu" (be watchful when alone).

## Parity Versus Property in Self-to-Self Relation

Needless to say, the best occasion to examine the self-to-self relation is solitude, when there is no intrusion or distraction from others. A relevant discourse on the ideal self-to-self relation is a famous passage known as shendu (be watchful when alone) from the Confucian classic, *The Doctrine of the Mean* (1893/1971): "There is nothing more visible than what is secret, and nothing more manifest than what is minute. Therefore the superior man is watchful over himself, when he is alone" (p. 384).

Based on traditional exegesis, the Confucian scholar Tu (1976) points out that this passage should be read in conjunction with the statement that immediately follows it:

While there are no stirrings of pleasure, anger, sorrow, or joy, the mind may be said to be in the state of EQUILIBRIUM. When those feelings have been stirred, and they act in their due degree, there ensues what may be called the state of HARMONY. (*The Doctrine of the Mean*, 1893/1971, p. 384, emphasis in the original)

Read in this context, the shendu passage suggests that in solitude one strives to pay attention to one's thoughts and feelings down to their subtlest variations—including the most tranquil state before any emotions are stirred. Thus Tu (1976) claims that all these statements

“seem to focus on what may be called the subjectivity of the profound person” (p. 4). He explains:

The profound person whose self-knowledge is deeper than most of us is, therefore, particularly concerned with the interiority of the self; what he neither sees nor hears is precisely the inner self upon which the manifestation of the Way [Tao] is based. (p. 4)

What we have here is a parity-based self-to-self relation, in which the self relates to its deeper truth as part to a larger whole.

By contrast, the objectification version of self-to-self relation is found in Wang’s (2006) Shendu Scale. This scale consists of two items, both of which emphasize self-scrutinizing and self-control in solitude. For instance, one item reads: “People should be watchful over their thoughts and behavior, not to violate any moral standards, even when they are alone.” This entails an asymmetrical (subject vs. object) self-to-self relationship.

### Capacity for Absence

The animistic expansion of ontological parity necessarily entails mind perception in both humans and nonhumans (Gray et al., 2007). In psychology, as terms such as anthropomorphism (Waytz et al., 2010) suggest, attribution of mind across the ontological boundaries is considered a lapse of reason. By contrast, animism suggests that the expansion of ontological parity entails not weakness so much as a strength—the capacity for absence.

The capacity for absence, so prominent in solitude seekers (Sundararajan, 2015), refers to the ability to transcend the visible, physical presence. Attribution of the mind to nonhuman and nonliving entities entails a capacity to transcend or override the physical cues of species boundaries. The ability to transcend conventional categories is the focus of training in the mindfulness of Ellen Langer (2000). It is also emphasized in the mindfulness of Asian traditions, for instance, in Confucianism. A case in point is the Confucian passage of shendu (be watchful when alone), in which, as Tu (1976) points out, escaping the capture of external stimuli is a prerequisite for access to the (inner) processes that one normally neither sees nor hears. Tuning into one’s own (normally inaccessible) experiences is a skill known as intrapersonal attunement in the mindfulness literature (Siegel, 2007). According to Siegel (2009), intrapersonal attunement in mindfulness entails “a relational process where you become your own best friend” (p. 145). This observation underscores a close connection between intimacy with oneself and the capacity for absence.

To the extent that the capacity for absence is essential for the expansion of ontological parity, an enabling condition would be solitude, in which reduced external stimuli can make it easier to escape the capture of the physically present cues of conventional categories. This is consistent with Averill and Sundararajan’s (2014) theory of authentic solitude, which is associated with perceived closeness with others as well as with oneself. Averill and colleagues developed an empirically validated Solitude Scale (Wang, 2006), which can be used for illustration here. How is it possible to feel cared for and connected with others when alone? The Solitude Scale item Intimacy suggests that companionship in solitude is possible if one has a capacity for absence: “Although alone, you feel especially close to someone you care about, for example, an absent friend or lover . . .” Similarly, a capacity to escape attentional capture of the social arena is required for self-to-self intimacy, as evidenced in the Solitude Scale item Freedom: “. . . you feel no need to please or impress anyone, but can be completely yourself.”

## Expanding Ontological Parity via Priming

The foregoing analysis of animism suggests two propositions:

- The foundation of intimacy is ontological parity, which refers to sameness in being, or in experiential terms, perceived kinship and closeness.
- Ontological parity is expandable beyond the social arena and beyond the conventional categories of human and nonhuman or living and nonliving.

From this a novel and testable hypothesis can be derived:

- It is feasible and salutary to prime felt kinship and closeness with the nonhuman and nonliving elements of nature.

This hypothesis was initially tested and confirmed in a study with Iranian samples (Sundararajan & Fatemi, 2016a, 2016b). As an extension and replication of the previous study, the current study was conducted across four cultures—Taiwan, India, mainland China, and the United States.

### Overview

Research design followed the previous study (Sundararajan & Fatemi, 2016a, 2016b), unless otherwise noted. Priming was cast in the mindfulness framework to facilitate the capacity for absence which is considered essential for the expansion of ontological parity. To encourage mindfulness, the experimental conditions were couched in terms of a Langerian mindfulness task (Langer, 2000) of crossing the boundaries of conventional categories. The cover story was also cast in the Langerian (Langer, 2000) framework of imagination and creativity. The manipulation check included self-report on one essential element of Langerian mindfulness (Langer, 2000), namely, engagement with the task. Since solitude also facilitates the capacity for absence, the theory of authentic solitude (Averill & Sundararajan, 2014) provided the parameter of outcome measures. The only change we made in the current study was the inclusion of two more measures: a Mood Scale was added as an outcome measure for emotional well-being; a When Alone scale was added to measure trait parity.

### Sampling

To the extent that animism is a legacy of traditional cultures, we expected some cultural variations in the endorsement of ontological parity between the mainland Chinese and Taiwanese, since the former had a relatively higher attrition of traditional cultures due to their turbulent history of modernization, in comparison to the latter's more gradual process of cultural evolution. To expand the scope of cultural variation, we further anchored the continuum of cultural retention on two extreme points: the United States, a Western, secular society of late modernity hypothesized to have far less retention of traditional cultures, on the one hand; and India, a modern society hypothesized to have far more retention of traditional cultures, on the other hand. In sum, we recruited samples from four societies—Mainland China, Taiwan, United States, and India.

### Priming

Nature slides were used as stimuli, since nature scenes are known to have beneficial effects on humans (Schertz & Berman, 2019). Participants were randomly assigned to two groups for contrasting mindset-inductions, respectively:

- Parity group: priming relationship with nature based on subject to subject parity;
- Property group: priming a disparity of subject versus object relationship such that nature is approached as property.

### **Predictions**

To the extent that intimacy is a parity-based relationship, it is likely to increase in both self-to-self and self-to-other relations when ontological parity is primed to expand across conventional boundaries. It was therefore predicted that possible cultural variations notwithstanding, the following effects of primed kinship and closeness with nature (parity group) will hold:

*Hypothesis 1:* There is no significant difference between the groups as assessed by the Langerian Mindfulness Scale. This was the finding in the previous study with Iran samples (Sundararajan & Fatemi, 2016a, 2016b).

*Hypothesis 2:* Parity group shows significantly more improvement than property group on measures of emotional well-being postpriming, as evidenced by relatively more reduction in negative emotions, especially anger. This prediction was not tested before.

*Hypothesis 3:* Parity group scores significantly higher than property group on measures of relational solitude postpriming. This was the finding in the previous study with Iran samples (Sundararajan & Fatemi, 2016a, 2016b).

*Hypothesis 4:* There is a significant interaction between culture and priming. This prediction was not tested before.

## **Method**

### **Participants**

This study was conducted in Mainland China, Taiwan, United States, and India over a period of 2 years between 2016 and 2018. In Taiwan, 116 college students (68 female, 48 male), 18 years old and above, were recruited from a university in North Taiwan via posters on the bulletin and website of the department of psychology. In Mainland China, 125 college students (100 female, 25 male), 18 years old and above, were recruited from a university in Northern Mainland China via announcements from psychology courses. In India, 50 undergraduates (35 females and 15 males), age 18 years old and above, from an elite university in Northern India were recruited by announcements from psychology courses. In the United States, 86 non-Asian participants (51 female, 35 male), age between 18 and 68, were recruited from the community in a college town in southern California via flyers and posters distributed to educational institutions, churches, and business. Ethnicity of the United States participants: Caucasian over 50%; African 6%; Latino 14%; Native American 5%.

Overall, there were 377 participants, and their age ranged from 18 to 68 ( $M = 23.81$ ,  $SD = 7.92$ ). There were 67.40% females (more details are presented in Table 1).

### **Measures and Materials**

#### **Stimuli**

A total of 59 slides of mountain scenes, was selected from the Internet (<http://www.mountainongs.net/index.php>). This set of mountain slides of all seasons was selected for their distant and misty scenes that help to reduce reality testing and enhance fantasy. This set was validated in a previous study on Iranian samples (Studies 1 and 2 combined,  $n = 105$ ;

**Table 1**  
*Participants' Demographics*

| Society        | N   | Male | Female | Age  |      |
|----------------|-----|------|--------|------|------|
|                |     |      |        | M    | SD   |
| Mainland China | 126 | 25   | 101    | 21.6 | 2.6  |
| Taiwan         | 114 | 47   | 67     | 20.8 | 2.2  |
| India          | 51  | 15   | 36     | 18.9 | 1.1  |
| United States  | 86  | 35   | 51     | 33.9 | 11.2 |
| Overall        | 377 | 122  | 255    | 23.8 | 7.9  |

Sundararajan & Fatemi, 2016a, 2016b). Slides were played automatically at the pace of 30 s per slide.

***Langer Mindfulness Scale (LMS)***

The LMS includes four subscales: Novelty Seeking, Engagement, Novelty Producing, and Flexibility (Langer, 2004). This scale showed great reliability and validity. In this study, Cronbach's alpha ranged from .74 to .82 in four samples. Based on the existing bilingual version of LMS, the English version was used in India and the United States; the Chinese version was used in Mainland China and Taiwan.

***When Alone Scale***

The When Alone Scale is designed to measure trait ontological parity in the self-to-self relations. This scale is based on a slight modification of Wang's (2006) bilingual Shendu (Be watchful when alone) Scale, which was normed on Chinese ( $n = 190$ ) and American ( $n = 221$ ) college students. The Shendu Scale consisted of two items, which were not significantly correlated,  $r = .06$ ,  $p = .37$ , but both emphasized an asymmetrical (subject vs. object) relationship of self-control and self-scrutiny in solitude. This contrasts sharply with the parity-based self-to-self relationship in Tu's (1976) exegesis of the shendu passage. To measure ontological parity in self-to-self relations, Wang's Shendu Scale was modified as follows: Item (a) was retained to measure the self-to-self relation in terms of an evaluating I and the scrutinized me; Item (b) was worded to be more in accordance with the traditional Confucian notion of a parity-based self-to-self relationship (Tu, 1976). Respective endorsement of these two items is anchored on a 5-point Likert-type scale.

For the trait parity index, (a) is subtracted from (b), with positive values suggesting high parity—and negative values, low parity—in the self-to-self relations. The English version was used in India and the United States, while the Chinese version was used in Mainland China and Taiwan.

***Solitude Scale***

The 20-item Solitude Scale is an expansion by Wang (2006) of an earlier, cross-culturally validated nine-item Solitude Scale of Long et al. (2003). Wang's (2006) scale consists of 20 types of solitude experiences, which were anchored on a 7-point Likert-type scale. Wang's (2006) cross-cultural samples (American,  $n = 221$ ; Chinese,  $n = 190$ ) replicated the inner-directed, self-to-self (autonomy) and outer-directed, self-to-other (community, or relatedness) structure of solitude, as well as the authentic versus inauthentic distinction in Long et al. (2003). According to Long et al. (2003), authentic solitude encompasses intimacy in self-to-self and self-to-other relations,

whereas inauthentic solitude is associated with loneliness-related symptoms (see also Averill & Sundararajan, 2014). Based on Bloom's (2009) distinction between relational and nonrelational cognition, we made further subdivision of authentic solitude into relational (autonomy and community) and nonrelational (competence) solitude, as shown in Table 2.

In the current study, Cronbach's alpha ranged from .61 to .67 in four cross-cultural samples. Considering the multidimensional nature of the scale, the reliability was acceptable. Based on the bilingual version of the Solitude Scale in Wang (2006), English version was used in India and the United States; Chinese version was used in Mainland China and Taiwan.

### **Mood Scale**

Facial expressions of six basic emotions—anger, disgust, fear, happy, sad, and surprise—were selected from the Japanese and Caucasian facial expressions of emotion (JACFEE; Matsumoto & Ekman, 1988). Japanese facial expressions were used in Mainland China and Taiwan; Caucasian faces in the United States and India—we were informed that Indians identified more with Caucasian than with Japanese faces. JACFEE showed a cross-nation reliability (Biehl et al., 1997), well-suited for this study. Participants were presented with six facial expressions and rated, on a 7-point Likert-type scale, the extent to which each facial expression matched his or her mood.

### **Procedure**

This study was approved by the institutional review boards of the respective institutions of Taiwan, India, Mainland China, and the United States. All participants were informed of the purpose, potential risks, benefits, and the right to withdraw from this study. Due to lack of facility, participants in the Taiwan study went to the lab individually. Priming was done in group settings for the rest of the participants in India, Mainland China and the United States. Incentive for participation was extra course credits in most samples, except for the American sample, in which each participant received a \$20 gift card.

After informed consent was signed, basic demographic data, such as age and gender, were collected (information on ethnic background was collected for the American sample only). Then the participants were randomly assigned to one of two experimental groups: parity versus property. Both groups read the same cover story, which claimed to be a study on human imagination.

**Table 2**  
*Twenty-Item Solitude Scale, With a Four-Dimensional Structure*

| Authentic solitude                  |                                    |                                     |                      |
|-------------------------------------|------------------------------------|-------------------------------------|----------------------|
| Relational solitude                 |                                    | Nonrelational solitude (competence) |                      |
| Community (outer-directed relation) | Autonomy (inner-directed relation) |                                     | Inauthentic solitude |
| (7) Intimacy                        | (5) Freedom                        | (9) Creativity                      | (15) Boredom         |
| (19) Reminiscence                   | (12) Daydreaming                   | (14) Problem solving                | (18) Recreation      |
| (10) Longing                        | (1) Inner peace                    | (8) Enlightenment                   | (3) Loneliness       |
| (4) Harmony                         | (11) Emotional Refinement          | (13) Self-transcendence             | (16) Relaxation      |
|                                     | (6) Self-discovery                 | (2) Heightened sensory awareness    | (20) Alienation      |
|                                     | (17) Self-enrichment               |                                     |                      |

*Note.* Adapted from Averill and Sundararajan (2014). Item numbers are in parentheses.

### ***Pretest***

Both groups took the same pretest measures which included the 20-item Solitude Scale, the Mood Scale, the LMS, and the When Alone questionnaire.

### ***Priming***

Before showing the slides, handouts with two separate instructions were distributed and read to participants. Both groups viewed the same mountain slides for 30 min.

**Mindset Induction of Parity Group.** Participants were instructed to put themselves in the shoes of Wordsworth or Li Po when viewing the nature slides, “to feel as much as possible the presence of the spirit, or mind—however you call it—of the mountains.”

**Mindset Induction of Property Group.** Participants were instructed to take up the role of a real estate entrepreneur, when viewing the nature slides, “to generate ideas as to how to make good investment on this piece of property.”

### ***Manipulation Check***

After the slide show, participants rated their own performance (feeling the presence of the mountain for parity group; making real estate investment for property group) of the experimental task on a 5-point Likert-type scale, and wrote for 15 min to answer the group-specific essay questions, which were intended to deepen the priming effect and also serve as manipulation check.

A sample essay question for the parity group: “Did your experience give you some insight into Li Po’s mutual gazing with his favorite mountain?”

A sample essay question for the property group: “Did your experience give you some insight into what it takes to make a successful real-estate investment?”

### ***Posttest***

The posttest included all measures in the pretest, with the exception of the When Alone Scale, which was not repeated. Instruction of LMS remained the same from pre- to posttest. Instructions for Solitude Scale and Mood Scale differed between pre- and posttest.

#### **Solitude Scale.**

**Pretest.** “What is your experience of solitude like? Here are 20 types of solitude experiences. Please rate the extent to which each type matches your experience of solitude.”

**Posttest.** “If one day you should find yourself alone in a place similar to the mountain you just viewed, how would you experience your solitude there? Please rate the likelihood of your having the types of solitude experience listed below.”

#### **Mood Scale.**

**Pretest.** “Please indicate the extent to which you feel the same way **This Week** as this face.”

**Posttest.** “Please indicate the extent to which you feel the same way **Right NOW** as this face.”

### ***Data Analyses***

All analyses included both overall combined samples data as well as sample by sample data. In combined data, ethnicity (Asian vs. non-Asian) was included and controlled by dummy coding variables (Participants from Mainland China, India, and Taiwan were coded as 1; those from the United States as 0). Repeated measures analysis of covariance was used for  $H_1$  to  $H_3$ . For the dependent variable of  $H_4$ , we calculated the difference score of the pretest and posttest of Solitude and Mood scales, with positive (negative) values indicating

increased (decreased) rating on relevant items postpriming. Multiple regression was used to test the interaction between culture as measured by trait parity and primed conditions (groups) of parity versus property. Raw scores, instead of  $z$  scores, of the When Alone Scale were used to compute trait parity.

## Results

### Pan-Cultural Analysis

#### Trait Parity

Descriptive statistics of trait ontological parity across the four samples is shown in Table 3.

Based on the pooled four-culture sample, a correlation analysis of pretested variables showed that trait parity was negatively related to age and happiness, but positively related to anger and sadness. The relationship of trait parity to gender (1 = *female*, 0 = *male*), mindfulness, fear, disgust, surprise, relational solitude, nonrelational solitude, or inauthentic solitude was not significant.

In summary trait ontological parity is a simple but stable measure as evidenced by the similar standard deviations among the four samples shown in Table 3. Trait parity was positively associated with self-reported anger and sadness, and negatively associated with happiness. This is consistent with its conceptualization as attunement to inner feelings. Also consistent with the Confucian notion of the innate self that is close to nature rather than culture, trait parity was negatively associated with age.

#### Group Difference (Parity vs. Property)

Independent-sample  $t$  tests showed there was no significant group difference (parity vs. property priming) in trait ontological parity and pretested mindfulness, anger, fear, sadness, disgust, happiness, relational solitude, nonrelational solitude, or inauthentic solitude (all  $ps > .10$ ). However, those primed by parity (vs. property) reported a lower level of surprise,  $t = -2.04$ ,  $p < .05$ .

As shown in Figure 1 and Figure 2, respectively, independent-sample  $t$  tests showed there was a significant group difference (parity vs. property priming) in the posttested anger,  $t = -2.19$ ,  $p < .05$ , fear ( $t = -2.08$ ,  $p < .05$ ), and relational solitude,  $t = 2.89$ ,  $p < .01$ , but not in sadness, disgust, happiness, surprise, nonrelational solitude, or inauthentic solitude (all  $ps > .10$ ).

Further, a 2 (within-subject factor: Time 1 vs. Time 2)  $\times$  2 (between-subjects factor: parity vs. property priming) mixed-design repeated-measure multivariate analysis of variance

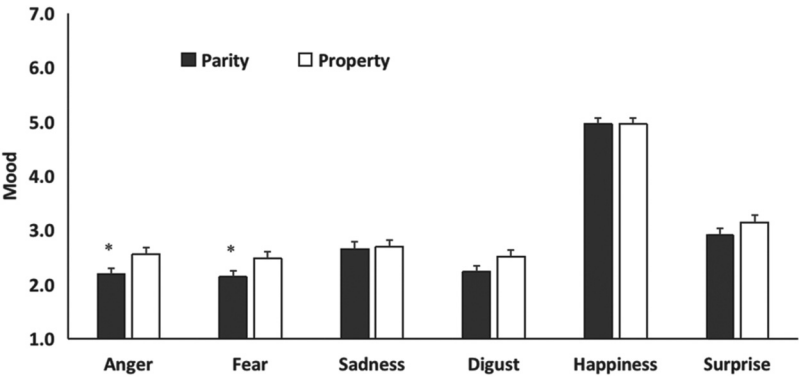
**Table 3**

*Index of Trait Parity Across Cultures*

| Samples        | $N$ | $M$  | $SD$ | 95% CI      |             |
|----------------|-----|------|------|-------------|-------------|
|                |     |      |      | Lower bound | Upper bound |
| United States  | 86  | -.41 | 1.43 | -.71        | -.10        |
| Mainland China | 126 | .02  | 1.20 | -.19        | .24         |
| Taiwan         | 122 | .68  | 1.21 | .46         | .89         |
| India          | 51  | 1.43 | 1.33 | 1.06        | 1.81        |

*Note.* Trait parity index is based on the difference score of items ( $b - a$ ) in the When Alone Scale. Item  $a$  = watching one's thoughts and feelings so as not to violate any moral standards, even when alone; Item  $b$  = getting in touch with one's thoughts and feelings when alone. Negative value = disparity in the self-to-self relationship; positive value = parity in the self-to-self relationship.

**Figure 1**  
*Post-Tested Mood Scores by Groups (Parity vs. Property)*



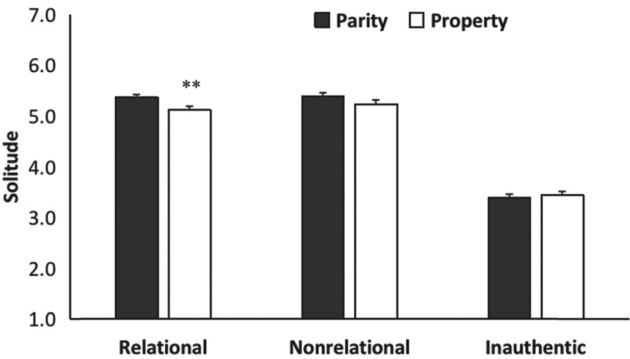
*Note.* The vertical bars in the histogram indicated standardized errors with 95% CIs in each group.  
\*  $p < .05$ .

(MANOVA; with gender, age, and ontological parity as covariates) was conducted. On anger, the results revealed no significant effect of time,  $F(1, 371) = 1.97, p = .16, \mu_p^2 = .01$ , but a significant interaction effect between time and priming,  $F(1, 371) = 4.37, p < .05, \mu_p^2 = .04$ . On fear, the results also revealed no significant effect of time,  $F(1, 371) = 0.13, p = .72, \mu_p^2 = .00$ , but a significant interaction effect between time and priming,  $F(1, 371) = 4.27, p < .05, \mu_p^2 = .01$  (Figure 3).

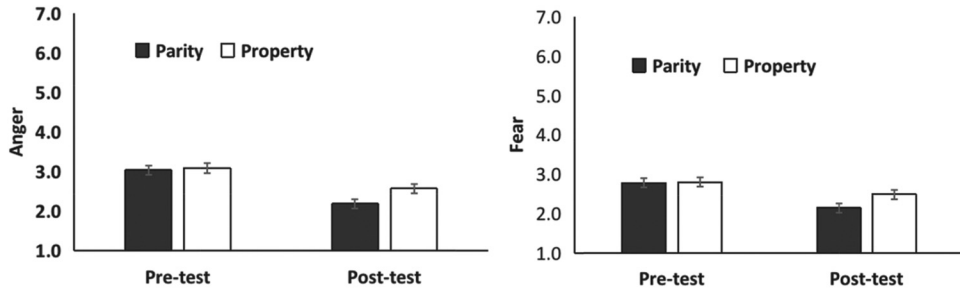
As for relational solitude, similarly, there was also no significant effect of time,  $F(1, 371) = 1.54, p = .22, \mu_p^2 = .00$ , but a significant interaction effect between time and priming,  $F(1, 371) = 4.23, p < .05, \mu_p^2 = .01$  (Figure 4).

On mindfulness, other emotions (e.g., sadness, disgust, happiness, and surprise), nonrelational solitude (competence) and inauthentic solitude, there was no significant main effect of

**Figure 2**  
*Post-Tested Solitude Scores by Groups (Parity vs. Property)*



*Note.* The vertical bars in the histogram indicated standardized errors with 95% CIs in each group.  
\*\*  $p < .01$ .

**Figure 3***Pre-/Post-Tested Mood Scores by Groups (Parity vs. Property)*

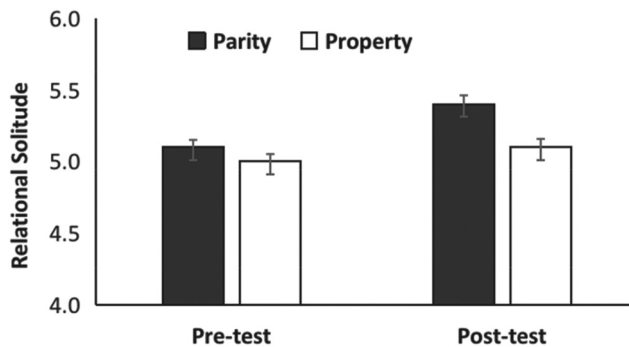
Note. The vertical bars in the histogram indicated standardized errors with 95% CIs in each group. Gender, age, and ontological parity trait were included as the covariates in the model, to clarify.

time,  $F(1, 371) = 0.13 \sim 2.30$ ,  $p = .13 \sim .67$ ,  $\mu_p^2 = .00 \sim .00$ ) or time-priming interaction effect,  $F(1, 371) = 0.01 \sim 1.31$ ,  $p = .25 \sim .94$ ,  $\mu_p^2 = .00 \sim .00$ ).

In summary, as predicted, there were significant group differences postpriming on anger and fear and relational solitude, to be elaborated in the discussion.

### Comparison in Retention of Traditional Cultures

Comparing societies with high retention (Taiwan and India) versus low retention (Mainland China and the United States) of traditional cultures, independent-sample  $t$  tests showed that those with high retention of traditional cultures reported higher levels of trait ontological parity,  $t = 7.88$ ,  $p < .01$  and pretested anger,  $t = 2.61$ ,  $p < .01$ , sadness,  $t = 2.83$ ,  $p < .01$ , and inauthentic solitude,  $t = 3.36$ ,  $p < .01$ . There was no significant cultural difference in mindfulness, pretested fear, disgust, happiness, surprise, relational solitude, or nonrelational solitude (all  $ps > .22$ ).

**Figure 4***Pre-/Post-Tested Solitude Scores by Groups (Parity vs. Property)*

Note. The vertical bars in the histogram indicated standardized errors with 95% CIs in each group. Gender, age, and ontological trait were included as the covariates in the model, to clarify.

Further, a 2 (within-subject factor: Time 1 vs. Time 2)  $\times$  2 (between-subjects factor: parity vs. property priming)  $\times$  2 (between-subjects factor: traditional vs. modern) mix-designed repeated-measure MANOVA (with gender, age, and trait ontological parity as covariates) was conducted. On anger, the results revealed no significant effect of time,  $F(1, 370) = 0.14$ ,  $p = .71$ ,  $\mu_p^2 = .00$ , but a significant interaction effect between time and priming,  $F(1, 370) = 5.16$ ,  $p < .05$ ,  $\mu_p^2 = .01$ . However, neither the interaction effect between time and culture,  $F(1, 370) = 2.20$ ,  $p = .14$ ,  $\mu_p^2 = .01$  nor the two-way interaction (time by priming and culture) effect,  $F(1, 370) = 2.71$ ,  $p = .10$ ,  $\mu_p^2 = .01$  was significant.

On fear, the results revealed no significant effect of time,  $F(1, 370) = 1.74$ ,  $p = .19$ ,  $\mu_p^2 = .01$ , but a significant interaction effect between time and priming,  $F(1, 370) = 4.06$ ,  $p < .05$ ,  $\mu_p^2 = .01$ . However, neither the interaction effect between time and culture,  $F(1, 370) = 2.63$ ,  $p = .11$ ,  $\mu_p^2 = .01$  nor the two-way interaction (time by priming and culture) effect,  $F(1, 370) = 0.03$ ,  $p = .86$ ,  $\mu_p^2 = .01$  was significant.

As for relational solitude, the results revealed a significant effect of time,  $F(1, 370) = 3.96$ ,  $p < .05$ ,  $\mu_p^2 = .01$ , of interaction effect between time and priming,  $F(1, 370) = 4.22$ ,  $p < .05$ ,  $\mu_p^2 = .01$ , and of interaction effect between time and culture,  $F(1, 370) = 11.99$ ,  $p < .01$ ,  $\mu_p^2 = .03$ . However, the two-way interaction (time by priming and culture) effect,  $F(1, 370) = 0.86$ ,  $p = .35$ ,  $\mu_p^2 = .00$  was not significant.

In addition, there was a significant effect of time on inauthentic solitude,  $F(1, 370) = 6.95$ ,  $p < .01$ ,  $\mu_p^2 = .02$  and a significant interaction effect between time and culture on nonrelational solitude,  $F(1, 370) = 4.75$ ,  $p < .05$ ,  $\mu_p^2 = .01$  and inauthentic solitude,  $F(1, 370) = 9.43$ ,  $p < .01$ ,  $\mu_p^2 = .03$ . There was no significant main effect of time, time-priming interaction effect, or time-culture interaction effect on mindfulness, other emotions (e.g., sadness, disgust, happiness, and surprise), no significant main effect of time on nonrelational solitude, and no time-priming interaction effect on nonrelational and inauthentic solitude.

Hayes's (2013) simple moderation models were conducted, using culture (high vs. low retention of traditions) as the potential moderator, pretest minus posttest score of emotions and solitude(s) as the dependent variable, parity (vs. property) priming as the independent variable, and with gender and age as covariates. The results showed a significant effect of priming on anger ( $B = -1.10$ ,  $SE = 0.51$ ,  $t = -2.14$ ,  $p < .05$ ), but not on any other emotions or solitude dimensions (all  $ps > .10$ ), and no interaction effect between priming and culture on emotions or solitude dimension was significant,  $F(1, 369) = 0.04 \sim 2.57$ ,  $p = .11 \sim .85$ .

In summary, societies (Taiwan and India) with relatively high retention of traditional cultures scored higher on trait parity than those with low retention (mainland China and the United States). Cultures with high retention also scored relatively higher on prepriming anger, sadness, and inauthentic solitude. There was a significant effect of priming on anger, but no significant interaction effect was found for culture and priming.

## Comparison Between Taiwan and Mainland Chinese

Comparing Taiwan (high retention of traditions) versus Mainland (low retention of traditions) Chinese cultures, independent-sample  $t$  tests showed that Taiwan Chinese reported a higher level of trait ontological parity,  $t = 4.33$ ,  $p < .01$ , and lower levels of pretested relational solitude,  $t = 2.08$ ,  $p < .05$  and nonrelational solitude,  $t = 2.41$ ,  $p < .05$ . There was no significant cultural difference in prepost tested mindfulness, anger, fear, sadness, disgust,

happiness, surprise, or inauthentic solitude, and no group (parity vs. property) effect on mindfulness, emotions, or solitude dimensions (all  $ps > .06$ ).

Further, a 2 (within-subject factor: Time 1 vs. Time 2)  $\times$  2 (between-subjects factor: parity vs. property priming)  $\times$  2 (between-subjects factor: Taiwan vs. Mainland Chinese) mixed-design repeated-measure MANOVA (with gender, age, and trait ontological parity as covariates) was conducted. On anger, the results revealed no significant effect of time,  $F(1, 234) = 0.03, p = .86, \mu_p^2 = .00$ , but a significant interaction effect between time and priming,  $F(1, 234) = 4.27, p < .05, \mu_p^2 = .02$  and between time and culture,  $F(1, 234) = 6.41, p < .05, \mu_p^2 = .03$ . However, the two-way interaction (time by priming and culture) effect,  $F(1, 234) = 0.64, p = .42, \mu_p^2 = .00$  was not significant.

On sadness, the results revealed no significant effect of time,  $F(1, 234) = 0.25, p = .62, \mu_p^2 = .00$ , but a significant interaction effect between time and priming,  $F(1, 234) = 4.17, p < .05, \mu_p^2 = .02$  and interaction effect between time and culture,  $F(1, 234) = 7.59, p < .01, \mu_p^2 = .03$ . However, the two-way interaction (time by priming and culture) effect,  $F(1, 234) = 0.42, p = .49, \mu_p^2 = .00$  was not significant.

As for relational solitude, the results revealed no significant effect of time,  $F(1, 234) = 0.00, p = .99, \mu_p^2 = .00$ , but a marginally significant interaction effect between time and priming,  $F(1, 234) = 3.41, p = .07, \mu_p^2 = .01$  and a significant interaction effect between time and culture,  $F(1, 234) = 11.99, p < .01, \mu_p^2 = .03$ . Also, the two-way interaction (time by priming and culture) effect,  $F(1, 234) = 3.16, p = .08, \mu_p^2 = .01$  was also marginally significant. In addition, there was a significant interaction effect between time and culture on nonrelational solitude ( $F(1, 234) = 3.33, p = .07, \mu_p^2 = .01$ , marginally) and inauthentic solitude,  $F(1, 234) = 17.63, p < .01, \mu_p^2 = .07$ . There was no significant main effect of time, time-priming interaction effect, or time-culture interaction effect on mindfulness, other emotions (e.g., fear, disgust, happiness, and surprise), no significant main effect of time on nonrelational and inauthentic dimensions, and no time-priming interaction effect on nonrelational and inauthentic solitude.

Hayes's (2013) simple moderation models were conducted, using culture (Taiwan vs. Mainland Chinese) as the potential moderator, pretest minus posttest value of emotions and solitude dimensions as dependent variable, parity (vs. property) priming as independent variable, and with gender and age as covariates. The results showed a significant effect of priming on relational solitude ( $B = 0.45, SE = 0.21, t = 2.20, p < .05$ ), but not on any other emotions or solitude dimensions (all  $ps > .10$ ). There was a marginally significant interaction effect between priming and culture on relational solitude,  $F(1, 234) = 3.06, p = .08, \Delta R^2 = .01$ , but not on emotions or any other solitude dimension,  $F(1, 234) = 0.00 \sim 1.06, p = .30 \sim .98, \Delta R^2 = .00$ . In particular, the priming effect of parity on relational solitude was significant for Taiwanese ( $B = 0.23, SE = 0.09, t = 2.47, p < .05$ ) but not Mainland Chinese ( $B = 0.00, SE = 0.09, t = 0.05, p = .96$ ).

In summary, since the concept of ontological parity is derived from the Chinese animistic folklores, it would be instructive to compare the two modern Chinese societies—mainland China and Taiwan, the former but not the latter sustained much attrition of traditional culture in the modern era. Taiwan Chinese relative to mainland Chinese scored higher on trait parity, and lower on prepriming relational solitude and nonrelational solitude. A significant interaction effect between time and trait parity was found for anger, sadness, and all solitude dimensions (relational, nonrelational, and inauthentic). However, trait parity did not have any significant interaction effect on priming, except for relational solitude, in which parity priming had an edge of advantage over property priming for the Taiwanese who scored higher on trait parity, but not mainland Chinese who scored lower on trait parity.

## Discussion

In the foregoing analysis, many statistical comparisons were made to demonstrate a solid structure to the complex conceptual frame of this study. While the results attest to the complexity of the data collected, due to space constraints, only the findings that are relevant to our predictions are discussed. Across the differing demographic contexts of four societies, Taiwan, India, Mainland China and the United States, results of this study supported the hypothesis that it is feasible and salutary to prime felt kinship and closeness with the nonhuman and nonliving elements of nature.

### ***H<sub>1</sub>: There Is No Significant Difference Between the Groups as Assessed by Langerian Mindfulness***

The results replicated the finding of the previous study with Iranian samples (Sundararajan & Fatemi, 2016a, 2016b). This helps to tease apart priming from Langerian mindfulness which was used to frame the priming tasks for both groups.

### ***H<sub>2</sub>: Parity Group Shows Significantly More Improvement Than Property Group on Measures of Emotional Well-Being Postpriming, as Evidenced by Relatively More Reduction in Negative Emotions, Especially Anger***

This hypothesis was confirmed for the first time, since emotion was not measured in the previous study. As predicted, results (see Figure 3) showed a significant group difference (parity vs. property priming) in the reduction of anger,  $t = -2.19$ ,  $p < .05$  and fear,  $t = -2.08$ ,  $p < .05$  postpriming. More specifically there was a significant time and priming interaction for anger,  $F(1, 371) = 4.37$ ,  $p < .05$ ,  $\mu_p^2 = .04$ , and fear,  $F(1, 371) = 4.27$ ,  $p < .05$ ,  $\mu_p^2 = .01$ . This suggests the possibility that expanding our ontological parity beyond the social arena and conventional boundaries is conducive to emotional well-being.

### ***H<sub>3</sub>: Parity Group Scores Significantly Higher Than Property Group on Measures of Relational Solitude Postpriming***

Replicating the finding of the previous study with Iranian samples (Sundararajan & Fatemi, 2016a, 2016b), results (see Figure 4) showed a significant time and priming interaction for relational solitude,  $F(1, 371) = 4.23$ ,  $p < .05$ ,  $\mu_p^2 = .01$ . Relational solitude consists of two authentic solitude categories—autonomy (self-to-self intimacy) and community (self-to other intimacy; see Table 2). Apart from the statistical evidence, the postpriming difference in relational concerns between the two groups is also evident in the postpriming essays. For illustration, consider the essays below by participants who gave the highest ratings of their own performance of the experimental tasks:

#### ***Parity Group***

India: The spirit lives in the beauty and might of the mountains that will tell of tales if you are willing to listen and will make you feel so small in their massive presence, but so special at the same time.

United States: “The experience was overwhelming. It felt like each image was a picture of the earth reaching out a massive hand to wave hello. I imagined what it would be like to spend time with the mountain in each photograph. Some mountains seemed warm and hospitable. Others seemed cold and distant, like they would appreciate some company but do not necessarily know how to extend an invitation. Some mountains even seemed to have their

own friends in the form of trees and flowers. Viewing image after image was indeed very overwhelming and beautiful.

### ***Property Group***

India: I came up with ideas to physically change the landscape as well as build something that would fit the current landscape.

United States: By looking at pictures on both cold winter and bright summer, I was able to see the availability of having different types of activities depending on the season. Matters regarding the safety and security of visitors also came to mind as well as the most cost-effective methods of access. The costs of developing the property as compared to the possible returns and the time in which such returns can be realized are also important considerations!

Postpriming essays in Mainland China and Taiwan samples showed similarly that relative to the property group, the parity group reported more experiences richly informed by self-to-other (transactions with the mountain) and self-to-self (keenly aware of one's feeling states) relations.

### ***H<sub>4</sub>: There Is a Significant Interaction Between Culture and Priming***

This hypothesis is only partially confirmed. There were ample cultural variations in evidence. In pan-cultural analysis, trait ontological parity was positively related to pretested variables of anger and sadness, and negatively related to age and pretested happiness. In cross cultural analysis comparing societies with high versus low retention of traditions, societies with high retention of traditional culture (Taiwan and India) scored higher on the index of trait parity, and pretested anger, sadness, and inauthentic solitude. However, it was only in the comparison between Taiwanese and Mainland Chinese that a marginally significant interaction between culture and priming was observed in the relational dimension of authentic solitude. More specifically, the priming effect of parity on relational solitude was significant for Taiwanese ( $B = 0.23$ ,  $SE = 0.09$ ,  $t = 2.47$ ,  $p < .05$ ) but not mainland Chinese ( $B = 0.00$ ,  $SE = 0.09$ ,  $t = 0.05$ ,  $p = .96$ ).

### ***Limitations and Potential Contributions***

One major limitation of this study is insufficient statistical power. Replication with larger samples and more cultures is a necessary step in future studies. Another related limitation is insufficient exploration of cultural variations due to small sample size.

As primarily a proof of the concept study, this pan-cultural investigation offers new insights that are relevant to multiple domains of research in psychology.

### ***Rethinking Intimacy***

This study has greatly widened the conceptual scope of intimacy. Intimacy needs not be tethered to physical presence, nor is it confined to the social arena. There is also the possibility for intimacy to cross the ontological borders of human versus nonhuman or living versus nonliving. In addition, this investigation offers some guidelines for gauging the quality of close relationships along the distinction between parity and property.

### ***Parity Matters***

The importance of ontological parity in relationship is consistent with the observed asymmetry in anthropomorphism (Waytz et al., 2010), which blurs the human versus nonhuman distinction in only one particular direction—treating everything as another mind—thereby

obviate blurring the distinction in another, less desirable, direction, namely treating everything as object. Yet, the parity principle is emphatically stressed in animism more so than any psychological theories of anthropomorphism. According to Bloom (2007), the human tendency to attribute agency and intention with minimal cues is attributable to a “hypertrophy of social cognition” (p. 149). On this account, the driving force behind animism is the over developed need for humans to connect. Our account, by contrast, suggests that the need for social connection is being harnessed to serve another distinctly human need—to expand its kind and being. One corollary of the centrality of ontological parity is that connecting without parity may not be desirable. As the COVID-19 pandemic is witnessing a surge of indiscriminate connections ranging from overconsumption of virtual networks to alcohol and drugs, this study offers a helpful guideline to gauge the quality of our relationships by the yardstick of ontological parity. Quick fixes of loneliness, such as drug and alcohol use, usually entail a commodity (object) approach to relationship with dire consequences.

## Morality

To the extent that “mind perception is the essence of morality” (Gray et al., 2012, p. 101; see also Gray & Wegner, 2011; Gray & Schein, 2012), this study is relevant to moral psychology. In particular, it is relevant to research on moral expansiveness (Crimston et al., 2016), which advocates for a form of moral universalism to extend our ethical obligations to groups that lie at the periphery of our moral concerns. Of the many attempts at moral universalism, the most common strategy is to develop an inclusive global identity (McFarland et al., 2012; Rosenmann et al., 2016)—to identify, for instance, with all of humanity. But as Allport (1954/1979) points out, this approach is plagued by a “special difficulty in fashioning an in-group out of an entity as embracing as humankind” (p. 43). To the extent that a superordinate “Human” category will gain traction only when we go into war with another species or with aliens from outer space, this global identity strategy contradicts the intention of moral universalism to transcend the “tribal” in-group and out-group distinctions.

A possibly more effective strategy toward moral expansiveness (Crimston et al., 2016) is suggested by our study. Whereas the relationship of category-based groups tends to be diluted as the group category expands, our results suggest on the contrary that intimacy may actually increase with the expansion of one’s kind. This phenomenon has been well documented in the lives of many ancient Chinese artists/hermits, who famously found their kith and kin in trees, rocks, mountains, and bamboos (Rowley, 1974). Our experimental design has captured this experiential, rather than conceptual, approach which may hold the key to the development of a more compellingly felt sense of kinship and closeness with all at the universal and cosmic level.

## Human Machine Interface

In our relationship with the machine, animism is readily seen when young children hug and talk to the interactive furry bots in the clinic (Kim et al., 2015; Rabbitt et al., 2015) and the classroom (Belpaeme et al., 2018). But adults tend to be concerned about such “primitive” mentality, a concern that finds ample support in the documented problems of intimacy with the machine (Turtle, 2011/2017), to be elaborated shortly. Seen through the lens of our study, it is reasonable to argue that problems of intimacy with the machine stem not from ontological border crossing, so much as from the commodification of this relationship by technology and the market.

Technology has redefined intimacy, as Turtle (2011/2017) points out, “when technology engineers intimacy, relationships can be reduced to mere connections. And then, easy

connection becomes redefined as intimacy” (p. 16). The technology of easy connection is basically a tyranny of presence. Many abuses of Facebook bear witness to the plight of our relationships as hostage in the land of eternal presence, where all transactions are stored as data in a machine memory that neither forgets nor forgives. This marks a profound reversal of commodification, a reversal in which the consumer becomes the commodity.

This inverted commodity (property) mode can turn the human machine interface into a predatory relationship. When relationship is reduced to external connections at the mercy of sensory stimulation, the social agent is rendered a conglomeration of buttons and vulnerabilities for the biologically evolved responses to be triggered by the interactive robot. Turkle (2011/2017) has documented extensively how (normally invisible) intentions of the social robots are rendered visible, physical performances that intrude and make demands on, or trigger, the child’s response. This interferes with the child’s capacity for absence (as manifest in imagination), since the intrusive presence of the interactive robots leaves little room for imagination that looms large in traditional doll play. In the worst scenarios, technologically engineered closeness that thrives on triggered biologically evolved responses is a perverted intimacy that borders on porno and torture—both of which serve to reinforce the tyranny of presence. In pornography, presence is seduction; in torture, insistence on presence (confession) and denial of absence (silence) result in aggression and violence. No wonder so many people cringe at the very idea of intimacy with the machine.

However, counter examples exist to support the implication of our study that if liberated from the commodity (property) mode, and restored to its original parity-based intentions, intimacy with the machine can be as beneficial as intimacy with another person. A case in point is the intimate relationship of over four decades between Harold Cohen (1928–2016), artist and pioneer in computer-generated art, and AARON, the artificial intelligence program he created (Sundararajan, 2014, 2019, 2020). In conclusion, as interactive technology greatly expands the frontiers of intimacy in the 21st century, the animistic principle of ontological parity, along with its intuitive distinction between parity and property, can be our wise counsel in a twofold sense: to help us navigate our ways in the changing landscape of our relationships; and to protect ourselves from the ever present possibility of a hijacked animism, when the market is joining forces with technology to take advantage of our innate tendencies to connect with the world.

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