

# SUPPLY CHAIN PSYCHOLOGICAL CONTRACT BREACH: AN EXPERIMENTAL STUDY ACROSS NATIONAL CULTURES

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Supply disruptions are commonplace in today's global supply chain environment. The sheer magnitude of daily transactions makes it inevitable that there will be disruptions, further exacerbated by differences in cultural norms and attitudes that add a layer of complexity to managerial response. In this research, we examine the impact of national culture on individuals' responses to supply disruptions due to psychological contract breach. Using data from controlled experiments conducted with 158 subjects in China and 125 subjects in the U.S., we evaluate changes in decision-making behaviors and assessments of attitudinal outcomes regarding trust and repurchase intentions. Our results show post-breach behavioral differences based on national culture, but find that these differences are short-term in nature. Additionally, cultural differences show up in both of the attitudinal outcomes assessed in this research. Following a psychological contract breach, individuals from the U.S. express less trust in their supply chain partner and less willingness to work with that partner again in the future as compared to individuals from China. Our research suggests that managers and scholars interested in the cultural influences on the response to supply disruption will benefit from further research and understanding focusing on the intersection of psychological contract breach and cultural distance.

*Keywords:* behavioral supply management; human judgment and decision making; buyer/supplier relationships; laboratory study; factor analysis; regression analysis

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## INTRODUCTION

Supply disruptions have become a daily source of business news. Recent examples have ranged from the severe and widespread, such as the Tianjin port

explosion that will negatively impact supply chains for months (Page & Chao, 2015), to the more contained, such as the delayed release of Apple Watches resulting from defective parts from one of their key suppliers (Wakabayashi & Luk, 2015). Academic interest in supply disruptions has increased over recent years, as well, with investigations focusing on strategies for preemptively reducing supply risks (Speier, Whipple, Closs & Voss, 2011; Zsidisin & Smith, 2005), the financial implications of disruption (Hendricks & Singhal, 2003, 2005a,b), and recall and safety issues (Ketchen, Wowack & Craighead, 2014; Roth, Tsay, Pullman & Gray, 2008). Comparatively little research has investigated the social and psychological implications of supply disruptions (Ellis, Shockley & Henry, 2011). One example pertinent to our work is that of Wang, Craighead and Li (2014), who evaluate how suppliers can rebuild trust following a disruption for which that supplier is responsible. We contribute to this important line of investigation into the psychological repercussions of disruption by evaluating the adverse impact of supply disruptions as occurring due to psychological contract breach.

While it is typically true that contracts form the foundation of a buyer-supplier exchange, it is often the case that certain terms of a relationship are not so straightforward or easy to explicitly define. As such, it is not uncommon for alternative governance mechanisms to fill in the gaps. One such mechanism is the psychological contract. The psychological contract is defined by the set of reciprocal obligations an individual perceives to have established with another entity (Rousseau, 1989), oftentimes predicated on the history of interactions with the partner (Rousseau & McLean Parks, 1992). Psychological contract breach occurs when an individual perceives insufficient fulfillment of obligations believed due from the contract partner (Rousseau, 1995).

The subjective nature of psychological contracts and psychological contract breach suggests that national cultural norms and values can potentially impart considerable influence on how these contracts are perceived and managed. Previous research has considered how cultural values can lead to misunderstandings between individuals and significantly impact perceptions of performance (Doney, Cannon & Mullen, 1998). In particular, several scholars have suggested the need to examine the influence of Chinese versus Western cultures on supply chain management practices (Choi, Lee & Kim, 1999; Zhao, Flynn & Roth, 2006; Zhou, Poppo & Yang, 2008), in part because of the vast degree of exchange occurring between these nations but more specifically due to their wide cultural gulf. Thus, the influence of national culture on psychological contracts together with the globalization of supply chains makes a critical argument for

research examining cultural differences in the perception of supply disruptions due to psychological contract breach. This is the research question we adopt for this study, focusing on differences stemming from the national cultures of China and the United States.

To investigate this question, we conducted a laboratory experiment in which we study participant behavior when a supply chain partner's actions represent a breach to historical performance. In brief, the experiment places participants in the role of a buyer of goods, and requires them to submit order quantity decisions to a supplier within the context of a relationship with a buy-back structure. The experiment involves multiple periods of decision making and is intended to closely model buyer-supplier partnerships that occur commonly around the world (Cachon & Terwiesch, 2006). We make three salient contributions with this effort: (1) we evaluate the impact of supply disruptions via a psychological lens; (2) we investigate the role of national culture on the response to supply disruption; and (3) we make these contributions through the use of behavioral research methods, thereby providing a much needed theoretical complement to the existing stream of literature (Siemens, 2011).

## THEORETICAL DEVELOPMENT

A breach of the psychological contract occurs when an individual perceives insufficient fulfillment of obligations believed due from the contract partner. Two factors influencing the assessment of breach include attribution and severity (Eckerd, Hill, Boyer, Donohue & Ward, 2013; Morrison & Robinson, 1997). Breach attribution assigns a root cause to the perceived failure, where the root cause can be ascribed as either external or internal to the partner.<sup>1</sup> A failure believed due to *external causes* results when the partner is willing but simply unable to fulfill the terms of the contract (Rousseau, 1995). In a supply chain context, external attribution may be illustrated by adverse weather conditions, such as a hurricane, delaying delivery of goods as promised. A failure believed due to *internal causes* represents a more severe form of breach, and is defined by a partner who is able but unwilling to follow through on promises (Morrison & Robinson, 1997; Robinson & Morrison, 2000). A supply chain illustration of internal attribution occurs

<sup>1</sup>We use the terms *external* and *internal* to describe attributions, however, in the psychological contract literature these are commonly defined as *disruption* and *reneging*, respectively. Given the placement of this work relative to supply disruptions, we deemed it necessary to clearly distinguish supply disruptions from psychological contract breach disruptions and therefore have adopted this alternate nomenclature.

in situations where demand far exceeds supply, such as after a hurricane when homeowners are trying to rebuild and available building materials are substantially limited. If suppliers allocate materials to buyers in a differential manner, such as providing preferential treatment to a powerful buyer like Home Depot, this may lead other buyers to feel that the supplier has purposefully reneged on their psychological contract.<sup>2</sup> This decision therefore involves internal causation. Psychological contract breach can also be experienced differently depending on the magnitude of the discrepancy. As the actions of a partner are believed to depart more from what is expected, the saliency of the discrepancy is heightened and the event is more likely to be perceived as a breach (Morrison & Robinson, 1997).

The importance of an individual's beliefs in the perception of psychological contract breach suggests that national culture can impart a considerable influence. Culture, as defined by Thomas, Au and Ravlin (2003), is the set of common values, attitudes, and beliefs shared by a social group and passed down through generations. The implications of culture in psychological contract theory manifest in two ways pertinent to our study. First, culture informs the process of schema-building essential in psychological contract formation (Fiske & Taylor, 1984), and also influences the way information is perceived and interpreted in relationship to the psychological contract (Thomas et al., 2010). Second, trust-building processes are also informed by culture (Doney et al., 1998). Trust is fundamental to psychological contracts, in that the contract holder must believe the other party is willing and able to execute obligations (Pruitt, 1981; Rotter, 1971). These beliefs are heavily influenced by culture.

We leverage the theoretical lens of psychological contracts so we may compare specific supply chain decision making behaviors across cultures. Previous research emphasizes culture as an important input to decision making styles (Dabic, Tipuric & Podrug, 2015), ethical decision making (Robertson & Fadil, 1999), and consumer-based financial decisions (Petersen, Kushwaha & Kumar, 2015). The decision-making behavior we assess in this research is the purchasing decisions (i.e., order quantities) of a buyer before, during, and after having experienced a breach. The decision has a structured, mathematical solution, but the phenomenon of breach creates a rationale for deviating from this solution (Eckerd et al., 2013). We

posit that the national culture of the decision maker may additionally aggravate or temper order deviations in response to the breach.

As is typical of developed countries, the U.S. is an individualistic society (Hofstede, 1984; House, Hanges, Javidan, Dorfman & Gupta, 2004; Trompenaars & Hampden-Turner, 1997), or more specifically a vertical individualist culture (Triandis & Gelfand, 1998). Individualism orients cognition and social judgments (Oyserman, 2006), and thus has implications for how a breach might affect one's decision-making behavior. In particular, individualists are described as intolerant toward equity imbalances, particularly where underpayments are concerned (Wheeler, 2002). Due to their desire for immediacy in outcome balance, these individuals are expected to maintain a lower threshold for breach (Morrison & Robinson, 1997). Thomas et al. (2003) apply the EVLN (exit, voice, loyalty, neglect) framework to predict that individualists will engage in neglectful behavior when dealing with a breach; for example, they may reduce efforts at maintaining the relationship. Similarly, Restubog, Bordia and Tang (2007) find that individuals who are transactionally oriented (i.e., individualists) and possess a low tolerance for inequity react to breaches with lower levels of organizational citizenship behavior and a greater propensity for workplace deviance, for example, taking undeserved breaks. This level of overt expressiveness is also characteristic of high indulgence (i.e., weak impulse control), and a short-term orientation, which can lead to potentially shortsighted and reactionary decision behavior (Hofstede, 1984; Javidan, Dorfman, DeLuque & House, 2006). In all, the cultural profile for the U.S. suggests that, for these individuals, psychological contract breaches have the potential to "result in poor task-related performance" (Restubog et al., 2007: 384). In our study, this points to the potential for exaggeratedly low order quantities in response to a breach.

China, on the other hand, is a collectivist society, wherein greater emphasis is placed on interdependence and an inclination to evaluate group members' actions in the aggregate. As such, collectivists tend to be more tolerant of imbalances (Morrison & Robinson, 1997). The EVLN framework predicts that in response to a breach, the predisposition of collectivists is to demonstrate loyalty, often by simply "patiently waiting for things to improve" (Thomas et al., 2003: 463). Restubog et al. (2007) find greater tolerance to breach may also be due to a long-term orientation and pragmatism, both dimensions characteristic of Chinese culture. Perceptions as to what constitutes a breach may be differently defined in China, as well. As a particularist society, situations are generally approached with more flexibility and adaptability

<sup>2</sup>These hypothetical examples are provided to illustrate psychological contract breach. In reality, these events are perceived at the level of the individual and are idiosyncratic to the individual, so identifying broadly applicable examples is not possible. We have, alternatively, provided some published examples of the broader phenomenon of supply disruption in the introductory paragraph. We thank an anonymous reviewer for this suggestion.

than in a more rules-based society like the U.S. (Trompenaars & Hampden-Turner, 1997). We expect these cultural distinctions to differentially impact the ordering behavior of Chinese individuals following a breach, specifically by responding to the breach in a more tempered fashion than those from the U.S. (i.e., smaller changes in order quantity in response to breach).

In our supply chain context, we evaluate order decisions both during and after the breach. We also assess breach attribution and severity. In Eckerd et al.'s (2013) previous evaluation of post-breach order quantities, they find that orders trend lower than what would otherwise be mathematically predicted due to reneging and breaches of major severity. However, given that their study evaluates only the orders occurring *post*-breach, we include here hypotheses regarding decision making behavior in the periods *during* the breach. This establishes the appropriate foundation by which to properly evaluate the hypotheses of primary interest—a national culture comparison across *all* ordering behavior. Using similar motivation as Eckerd et al., we expect internal attributions and major severity breaches to elicit the biggest changes in order behavior, as compared to breaches that are attributed to external causes or that are minor in severity.

- H1: Breaches attributable to internal (versus external) causes will be associated with lower order quantities during the breach.
- H2: Breaches that are major in nature (versus minor) will be associated with lower order quantities during the breach.
- H3: Individuals associated with U.S. national culture (versus Chinese national culture) will exhibit lower order quantities: (a) during a breach, and (b) following a breach.

While the changes in order behavior are explicit, there are other less overt ways in which psychological contract breach can damage exchange relationships. In particular, breach may adversely impact attitudinal outcomes like trust and commitment. These aspects are critical to buyer-supplier exchange performance, and in addition are experienced differentially through the lens of national culture. Generalized trust is “based on commonly shared norms” (Fukuyama, 1995: 26). Moreover, trust involves emotion (Schoorman, Mayer & Davis, 2007), and emotional expression is strongly tied to culturally prescribed rules (Matsumoto, 2001). Similarly, several of the commonly adopted dimensions of culture (including individualism and power distance) are theoretically tied to individual and group level commitment, and empirically drive continuous commitment in particular (Fischer & Mansell, 2009). In light of this, we seek to

understand the role of national culture in emotional responses following a breach. In our research, these emotional responses are expressed as attitudinal outcomes representing assessments as to the levels of trust and commitment following a breach.

Trust is foundational to psychological contracts. As a breach represents a perception that obligations have gone unfulfilled, the breach provides some evidence that the partner is potentially untrustworthy. This negative trust assessment is likely different depending on the characteristics of the breach. Commitment is another key attitudinal outcome negatively affected by breaches of the psychological contract (Lapalme, Simard & Tremblay, 2011; Ng, Feldman & Lam, 2010; Zhao, Wayne, Glibkowski & Bravo, 2007). In this research, we define commitment as the desire to do business with a partner again if given the opportunity. Generally speaking, when the breach is attributable to an internal cause (i.e., the partner is perceived as able but unwilling to fulfill obligations) then trust and commitment evaluations will be lower than when the cause is external, and thus perceived as uncontrollable. Likewise, breaches of greater severity are expected to exacerbate negative trust and commitment evaluations as compared to minor severity breaches.

Across each of these attitudinal outcomes, we expect the more negative intensified response to reside with those from the U.S., as compared to individuals from China. Fukuyama (1995) posits in his early seminal work that the U.S. is associated with a higher degree of generalized trust than China, and that the bounds of that trust extend farther than the bounds in China. This suggests possibly higher stakes for breach of trust in the U.S. as compared to China. Leveraging the cultural frameworks, individualists are found to demonstrate a preference for communicating honestly, even somewhat harshly at times (Ren & Gray, 2009). When matched to the EVLN framework, this characteristic implies that individualists will not hesitate to voice their disapproval of a supply chain partner (Thomas et al., 2003). Further, in a study of negotiating agents, traders from low power distance cultures (like the U.S.) were described as responding emotionally to situations in which they were made to feel powerless (Hofstede, Jonker & Verwaart, 2012). Based on this literature, we expect that upon facing a breach, individuals from the U.S. will share an exacerbated negative experience of attitudinal outcomes as compared to individuals from China, as well as feel less restrained in expressing them.

China's national culture profile depicts a different attitudinal response to breach. Empirical research by Westwood, Sparrow and Leung (2001) suggests that collectivist cultures experience a higher threshold for psychological contract violation. It has also been proposed that the Chinese are willing to allow a partner



the opportunity to save face (Thomas et al., 2003) and maintain harmonious relations with a partner if possible (Hofstede, 1984). These cultural norms emphasize tempering emotional reactions and withholding negative attributions, even if called for (Ren & Gray, 2009), such as in the instance of psychological contract breach. This is consistent with findings from a meta-analysis of commitment, where collectivists were found to demonstrate high continuance commitment (Fischer & Mansell, 2009). Interpreting this literature within the context of our own study, we expect that in response to a breach individuals from China will experience attitudinal outcomes in a moderated fashion as opposed to individuals from the U.S., as well as exhibit less inclination in expressing these sentiments.

**H4:** Breaches attributable to internal (versus external) causes will be associated with: (a) less trust, and (b) lower repurchase intentions.

**H5:** Breaches that are major in nature (versus minor) will be associated with: (a) less trust, and (b) lower repurchase intentions.

**H6:** Individuals associated with U.S. national culture (versus Chinese national culture) will exhibit: (a) less trust, and (b) lower repurchase intentions.

## METHODS

### Context of the Investigation

In order to study the research hypotheses presented, we administered a laboratory experiment, in which participants were asked to assume the role of a buyer of floral goods for a large upscale grocer. Floral goods are perishable, therefore unsold goods cannot be inventoried for sale in a later period. Participants are matched with a supplier, who participants are told has recently secured access to a secondary market for these goods if not sold. This context resembles a buy-back scenario, which is a common form of returns policy offered in supply chain relationships for items that are perishable or have high risk of obsolescence or demand saturation (Cachon & Terwiesch, 2006; Padmanabhan & Png, 1995). This is also a form of the well-known newsvendor problem in which setting inventory levels for a perishable product is highly dependent on the relative cost of overstocking versus understocking. The buy-back scenario is intended to be advantageous to buyers and suppliers alike. The supplier agrees to purchase back unsold goods at the end of each period for some salvage value, thereby sharing the buyer's risk of unsold merchandise, and in turn, the buyer tends to order more than he would otherwise. The scenario proves beneficial for our

experiment, as it provides one clear decision to be made by each of the firms engaged in the exchange: the purchaser determines an order quantity and the supplier determines a buy-back price. These decisions are made each period.

Our research goal is improved understanding of the nuances of a specific decision making problem in a supply-chain context. The application of a controlled laboratory experiment facilitates the examination of individual actors' influence on supply chain decisions within organizations (Knemeyer & Naylor, 2011). The setting of the experiment provides participants an opportunity to engage in a decision making task common to those managing inter-firm relationships. The task is carried out repeatedly over a number of periods, thus simulating decision making over time. Half-way through the experiment, a relationship breach is imposed by the supplier, thereby allowing us to observe any changes in the buyer's decision making behavior brought about by the breach. The experiment concludes with an exit survey designed to capture attitudinal outcomes experienced by the participants.

### Experimental Design

We conduct a  $2 \times 2$  (severity  $\times$  attribution) between-subjects laboratory experiment consisting of 20 periods of exchange during which the participants, acting as buyers, place orders for goods. Each participant has a single supplier who serves as their supply chain partner for the entire 20 periods. Until the point of violation, the supplier's pricing decision on buy-backs is stable. During the three consecutive periods of breach (periods 11, 12, and 13), the supplier provides a buy-back price on unsold items that is lower than what was provided in previous periods. A breach of *minor* severity is one that is 80 percent of the originally honored buy-back price, and a breach of *major* severity is one that is just 20 percent of the historically observed price. The supplier also submits a message to the buyer during each of these three breach periods providing the rationale for the deviation in price. The message cites either an external or internal attribution, where the *external cause* is an unexpected and temporary increase in transportation costs to be shared between the parties. In contrast, an *internal cause* is a temporary shortage of supplier buy-back funding forcing the supplier to make a choice about how to distribute these buy-back funds; the supplier opts to short the buyer (our participant) so that the supplier can fully reimburse one of the buyer's competitors. The supplier's pricing actions during the breach result in a higher expected profit for the supplier at the buyer's expense. After the 13th period, the supplier returns buy-back pricing to the pre-breach level.

In all cases, the supplier is a programmed participant, designed to provide predetermined buy-back prices for all unsold goods each period. Automation

of the role of the supplier allows us the control necessary to induce a breach from historical exchange conditions during the 11th–13th periods of the experiment. However, it was also deemed important for the development of relationship conditions that participants believed they were working with a human counterpart, therefore participants were informed that their partner in the experiment was another student in a separate lab. Use of confederate (i.e., computer programmed) players in two-party experiments is not uncommon in order to control variability and maintain focus on the experimental variable (Lount, Zhong, Sivanathan & Murnighan, 2008; Schweitzer, Hershey & Bradlow, 2006). Despite this precedence in the literature, we recognize the use of deception is a controversial one (Kimmel, 1998; Ortmann & Herwig, 1997). In consideration of this, we did not execute the decision to employ a confederate merely as a matter of course, but employed this particular research design because it was the appropriate design to accomplish the goals of the research. In further keeping with the requirements of responsible research conduct as outlined by the Belmont Report (1979), we debriefed all subjects as to the true nature of the experiment after completion of all sessions.

Another key issue brought about by this design choice was ensuring that the actions of the programmed supplier appear natural to the participants of our experiment. Accordingly, and following with the research protocol of Eckerd et al. (2013), we introduced several design features to enhance supplier realism. First, there was a variable lag to the amount of time that lapses as the automated supplier makes pricing decisions. Second, the prices submitted by the automated supplier varied by about 10 percent to reflect the behavior of an actual person on the supplier end. The exact amount varied was consistent across treatments and individuals.

Finally, the experimental design was validated in following with procedures recommended by Rungtusanatham, Wallin and Eckerd (2011). First, we minimized researcher bias by adhering to strictly standardized protocol and randomizing subjects to treatments. Second, we conducted realism checks, having participants rate the realism of the experiment along three dimensions. On items measuring realism and believability, scores respectively averaged 4.022 and 4.267 on a 5-point scale ("strongly agree" anchored at 5), and on an item measuring role involvement the average score was 4.6 (same scale). Finally, manipulation checks were conducted to evaluate for differences in the perceived levels of the two factors of psychological contract breach. These checks were conducted with a manipulation check group of 116 undergraduate students from the same population as those who sat for the main experiment. Use of a separate

manipulation check group is useful in eliminating demand characteristics as the source of changes in the dependent variable of interest (Perdue & Summers, 1986). Factor levels proved significantly different from each other on both treatments (see Table 1). Interactions of the manipulations were not significant, therefore alleviating concerns of confounding effects (Bachrach & Bendoly, 2011).

### Experimental Procedures

Participants were recruited from undergraduate business programs at a Chinese university in Beijing and a major U.S. public university, and randomly assigned to one of the treatments. All participants were screened such that only Chinese nationals in China and U.S. nationals in the United States were included for this study. In total, 158 observations were collected from the experiment sessions run in China, and 125 observations were collected from the U.S.-based sessions.<sup>3</sup> Sample size calculations determined a minimum of 24 observations per each distinct treatment; therefore our samples were appropriate given the number of treatments and comparisons made.

The original experiment was developed in English. For our administration in China, the documents were translated into Chinese by a native speaker, then back-translated by a different native speaker. Experiment sessions lasted about one hour in length, beginning with a presentation detailing the experiment scenario. While all participants assumed the role of a buyer, they were educated about the roles and decision making responsibilities of both the buyer and supplier sides. Hard copies of the instructions were made available at each workstation, and included a decision support guide to aid in the task of finding an appropriate order quantity given the parameters of the experiment<sup>4</sup> and potential buy-back prices. Although all students had either taken or were presently enrolled in an introductory class in operations management and therefore aware of supply chain coordination systems like the one under investigation, the calculations used to determine order quantities are rather complicated. The decision support tool facilitates a more consistent understanding of the problem across participants.

<sup>3</sup>Subjects for the U.S. based administration participated in a broader study, the results of which are reported in Eckerd et al. (2013). A subset of those U.S. data is used here and is supplemented with data collection in China. The China data were collected specifically for this effort, and have not been previously published elsewhere.

<sup>4</sup>Static parameters applying to all treatments include the following: a purchase price of \$35 per unit; retail price of \$55 per unit; zero lead times; production and salvage values of \$16 and \$15 per unit, respectively; return shipping of \$3 per unit; and, average demand of 400 units with standard deviation of demand of 200 units.

TABLE 1

## Manipulation Check of the Psychological Contract Breach Factors

Factor	Levels	Mean (SD)	Significance
Severity	Minor	4.55 (1.617)	$p = .0013$
	Major	5.55 (1.651)	
Attribution	External	3.91 (1.745)	$p = .0031$
	Internal	4.80 (1.424)	

Following the introduction and explanation of procedures, participants commenced with the ordering process on computers provided at their workstations. The program, identical to that employed in Eckerd et al. (2013), consists of a sequence of three screens repeating through 20 order periods. The first screen asks the participant for an order quantity, followed by a screen which reveals the demand realized<sup>5</sup> for the period and a calculation of the resulting inventory overage or underage (if any). Participants click to acknowledge this information, thereby sending left-over items (if applicable) back to the supplier. After a delay of random duration (thus simulating the variable decision making time of the “human” supplier played by the computer), the third screen shows the participant the buy-back price sent from the supplier. This screen includes both a detailed breakout of the information pertinent to the participant’s own profitability, as well as a summary of current and previous periods’ profitability earned by both the buyer and supplier.

After completing all 20 periods, participants responded to an exit questionnaire. This survey asked participants to rate how much they trust their supplier and how much they want to work with that supplier in the future. Both items were assessed on a 7-point Likert scale where 1 = “Not at All” and 7 = “Completely.” Correlations, means, and standard deviations for all study variables are provided in Table 2.

Participants were awarded extra course credit for signing up for and attending an experiment session, and were additionally entered into a lottery for a performance-based incentive. Lottery winners were drawn after completion of all sessions, where the odds of winning the lottery were proportional to the participant’s profits earned during the experiment. Winners of the lottery received a gift card valued at \$50 in the U.S. and 100 Yuan in China, which are representative rates for experiments in the locations we conducted the experiments. There was one lottery winner for each of the sessions conducted.

<sup>5</sup>A single demand pattern was generated in advance and identically administered in each of the treatment groups to avoid any confounding effects of different demand streams between subjects or groups.

## ANALYSIS AND RESULTS

Hypotheses 1 and 2 evaluate whether certain conditions lead to significantly lower order quantities during the breach. We anticipated that more severe breaches (versus less severe) and attributions of internal cause (versus external cause), would result in lower order quantities. Hypothesis 3 hypothesizes that identification with the U.S. culture (versus Chinese culture) will result in lower order quantities during and after a breach. In order to test these hypotheses, data from the order quantities that participants submitted over the 20 periods of the experiment were divided into four separate groups representing pre-breach order periods, breach order periods, and short-term and long-term post-breach order periods. We constructed the dataset as a panel, with one observation per time period for each individual. This approach allows us to account for residuals unique to each particular ordering period across all participants, as well as residuals associated with each individual respondent, enabling us to discern the evidence regarding our hypotheses. Given several non-time-varying independent variables, we ran several separate panel random-effects generalized least squares regression models (Finkel, 1995) using order quantity as the dependent variable, and attribution, severity, and nationality as independent variables. A number of control variables were considered for the analysis, as well: demand in the previous period, the order quantity submitted in the previous period, participant’s gender, and the attitudinal variables of trust and repurchase intention.<sup>6</sup> Results are shown in Table 3.

As can be seen in Table 3, differences in initial (pre-breach) ordering behavior are *not* driven by our manipulated variables of attribution and severity. This is to be expected, as the breach has not yet occurred. As an indication of the validity of the experimental design, and its applicability across national contexts, nationality also had no effect on pre-breach ordering behavior. This indicates that there was no independent

<sup>6</sup>In addition, we assessed models with additional control variables and including theoretically derived interaction terms. These variables did not add explanatory power to our results, and our key results were robust across these different model specifications.

TABLE 2

## Correlations

	Mean (SD)	(1)	(2)	(3)	(4)	(5)
Trust (1)	4.70 (1.31)	–				
Repurchase intention (2)	4.45 (1.51)	.644*	–			
Average orders pre-breach (3)	410.47 (48.11)	.100	.066	–		
Average orders during breach (4)	330.31 (95.49)	.151*	.121*	.471*	–	
Average orders post-breach (5)	414.46 (62.31)	.078	.119*	.339*	.175*	–

\* $p \leq .100$ .

cultural effect on pre-breach ordering behavior, suggesting that participants from both cultures understood the task at hand, and absent a breach they tended to make very similar ordering decisions. Of the control variables, trust, gender and the previous period's demand and order quantity appear to have some influence on pre-breach ordering behavior.

Next, we evaluated the pattern of ordering behavior during the breach. In these periods, we observe that the control variables of gender, last period's demand, and the previous order quantity all continue to influence ordering behavior during the breach, as does a control variable added to account for each individual's average pre-breach ordering behavior. Neither of the manipulated factors of attribution and severity nor the individual's national culture lead to significantly different order quantities. As such, we do not find support for H1, H2, or H3a.

Finally, in examining the post-breach order behaviors, we separate out the short-term effects of breach as compared to the long-term effects of breach. The short-term effects are captured by analyzing an average of the orders placed during the first three periods following the breach, and the long-run effects consist of the average of the final three periods remaining in the 20-period experiment.<sup>7</sup> Analyzing the data in this manner, we see that attribution has a strong initial, but not lasting, impact. Although not hypothesized, it is interesting to note that those individuals in the internal attribution treatment placed orders in the short-run that were approximately 20 units lower than those in the external attribution treatment. This provides some evidence for the harmful nature of internal attributions regardless of cultural affiliation. National culture was, in fact, only a significant predictor in the short run; during the first three periods following breach, participants from the U.S. placed orders that

were on average 12 and a half units lower than their Chinese counterparts. Interestingly, our analysis reveals that in the long-term this factor is no longer significant, and orders are statistically equivalent between both the U.S. and Chinese cultures by the last three periods of the experiment. In summary, we do find evidence that post-breach orders are different across cultures, at least in the short-term, thereby supporting H3b.

As a way to both check the robustness of this latter finding, and gain insight into the timing of ordering behavior changes, we also ran a Cox proportional hazards model (Allison, 1984). The Cox model is set up to assess the proportional "hazard," or the probability that a subject returns to normal ordering behavior, as defined by pre-breach average orders by subject, in each successive time period post-breach. The model predicts a hazard rate,  $\lambda_i(t)$  as the likelihood that subject  $i$  returns to pre-breach ordering behavior at ordering period  $t$ , excluding any subjects that already recovered ordering behavior at a period prior to  $t$ . For each independent variable in the analysis, we report a hazard ratio, predicting the odds of order recovery at the next time period. A hazard ratio near 1 indicates even odds; in other words if a dichotomous variable predicted a hazard ratio of 1, then the odds of respondents with and without the characteristic in question are equally likely of order recovery at each subsequent post-breach time period. Hazard ratios greater than 1 indicate higher odds of order recovery, or more quickly returning to pre-breach ordering behavior, and hazard ratios less than 1 indicate lower odds of order recovery, or more simply, slower order recovery. We assess order recovery as occurring whenever a subject places an order in periods 15–20 that is at least as large as the average order that the subject placed pre-breach.

As seen in Table 4, the Cox model confirms and provides a bit more insight to the panel models described above. About 90 percent of the subjects did eventually recover to pre-breach ordering rates, and they did so on average about 2.8 time periods after the end of the breach period. The odds of a subject from the U.S. recovering their ordering behavior in each subsequent period were about 76

<sup>7</sup>The calculation of short-term versus long-term in this paper is a departure from that used in Eckerdt et al., 2013. They used an average of all periods following the breach to represent long-term impact, whereas we use just the last three periods to avoid confounding the short-term and long-term effects. We thank an anonymous reviewer for pointing this out to us.



TABLE 3

## Panel GLS Results of Order Behavior

	Dependent Variables			
	Pre-Breach Orders	Orders During Breach	Post-Breach Orders (Short-term)	Post-Breach Orders (Long-term)
Experiment factors				
Attribution (external = 0, internal = 1)	−3.678 (3.748)	2.329 (7.469)	−19.616 (7.117) <sup>***</sup>	−3.765 (5.989)
Severity (minor = 0, major = 1)	3.374 (3.783)	−11.713 (7.546)	5.489 (7.159)	−.079 (6.045)
Nationality (China = 0, U.S. = 1)	−.696 (4.077)	−5.701 (8.118)	−12.497 (7.770) <sup>*</sup>	2.431 (6.520)
Controls				
Trust	3.370 (1.948) <sup>*</sup>	2.989 (3.899)	−3.427 (3.694)	−.484 (3.118)
Repurchase intent	−.345 (1.648)	2.681 (3.283)	3.833 (3.120)	3.377 (2.637)
Gender (male = 0; female = 1)	−14.567 (3.889) <sup>***</sup>	−14.283 (7.887) <sup>*</sup>	−1.580 (7.458)	−.177 (6.292)
Last order	.226 (.019) <sup>***</sup>	.401 (.035) <sup>***</sup>	.225 (.028) <sup>***</sup>	.172 (.034) <sup>***</sup>
Previous demand	.092 (.010) <sup>***</sup>	.821 (.126) <sup>***</sup>	.139 (.025) <sup>***</sup>	.222 (.030) <sup>***</sup>
Avg. pre-breach		.410 (.089) <sup>***</sup>	.280 (.077) <sup>***</sup>	.392 (.065) <sup>**</sup>
Constant	277.558 (12.558)	−136.661 (42.715)	145.662 (38.460)	128.901 (24.524)

Reported values are  $\beta$  (SE); <sup>\*</sup> $p \leq .100$ ; <sup>\*\*</sup> $p \leq .050$ ; <sup>\*\*\*</sup> $p \leq .010$ .

percent of the odds of a Chinese subject recovering their order sizes. This indicates that Chinese subjects tended to return to normal ordering behavior more quickly than U.S. subjects. We see a similar hazard ratio with the attribution variable; the internal attribution treatment recovered their orders more slowly than those in the external attribution group (hazard ratio of 77 percent, or a probability of recovery that is 23 percent less than the external attribution group). Finally, although the effect size is small, those who tended to order more in the pre-breach period were slower to recover than those who were more conservative in the pre-breach period.

We now turn to an analysis of H4, H5, and H6, where we examine whether the manipulated factors and cultural orientation have any impact on trust and repurchase intentions. Here we conduct multiple regression analyses, using data collected from the exit survey. Results of these analyses are reported in Table 5. As the results show, nationality and severity are significantly associated with trust and repurchase intention. In support of H5, those in the major severity treatment reported lower levels of trust and were less likely to repurchase from their supplier than those in the minor severity treatment. Likewise, in support of H6, U.S.

TABLE 4

## Cox Proportional Hazards Model Results of Time to Order Recovery

	Hazard Ratio
Experiment factors	
Attribution (external = 0, internal = 1)	.766 (.097) <sup>*</sup>
Severity (minor = 0, major = 1)	1.005 (.127)
Nationality (China = 0, U.S. = 1)	.760 (.101) <sup>*</sup>
Controls	
Gender (male = 0; female = 1)	.866 (.114)
Avg. pre-breach	.996 (.001) <sup>*</sup>

Reported values are *Proportional hazard ratio* (SE); <sup>\*</sup> $p \leq .050$ ; 90 percent of subjects' orders recovered to pre-breach rates by period 20, with a mean time to recovery of 2.83 periods.

participants experienced significantly lower levels of trust and repurchase intention than participants from China. We were surprised to find that attribution had no

TABLE 5

## Multiple Regression Results of Attitudinal Outcomes

	Dependent Variable	
	Trust	Repurchase Intention
Independent variables		
Attribution (external = 0, internal = 1)	-.111 (.149)	-.264 (.177)
Severity (minor = 0, major = 1)	-.304 (.149)**	-.498 (.176)***
Nationality (China = 0, U.S. = 1)	-.771 (.156)***	-.329 (.184)*
Control variable		
Gender (male = 0; female = 1)	-.115 (.155)	-.197 (.183)
F	7.431***	3.480**
Overall R <sup>2</sup>	.097	.048
Adjusted R <sup>2</sup>	.084	.034
Change in Adjusted R <sup>2</sup>	.095	.047

Reported values are  $\beta$  (SE); \* $p \leq .1$ ; \*\* $p \leq .05$ ; \*\*\* $p \leq .01$ .

apparent bearing on trust levels and repurchase intentions, leading to a lack of support for H4.

## DISCUSSION

In this research, we investigate differences attributable to national culture on the response to supply disruption due to a psychological contract breach. The supply disruption literature has recognized the need for greater emphasis on social and psychological causes and implications of disruption, but has yet to fully embrace them (Ellis et al., 2011). We make a contribution to this burgeoning stream of research through the lens of psychological contract theory and a focus on national culture.

When it comes to decision making behaviors in response to a relationship breach, we observe a cultural difference in the post-breach ordering behaviors in the short-run; U.S. participants decreased their order quantities by a significant margin compared to Chinese participants. The strong and immediate negative reaction of U.S. participants is consistent with various aspects of their cultural profile. We found it interesting, however, that in the long run U.S. participants' order quantities converged with those submitted by the Chinese participants. This suggests that while the impact of culture on ordering behavior in response to psychological contract breach is significant, it is also brief. The truncated nature of the reaction is consistent with low levels of pragmatism, and also demonstrates a quick reorientation towards personal economic interest as is characteristic of individualists (Hofstede, 1984; Restubog et al., 2007). Practically speaking, it is useful to understand the reactionary behaviors exhibited by individuals from the U.S., but also useful to understand that these

reactions are likely short-lived. To add greater refinement to our findings surrounding ordering behaviors, we evaluated the rate of recovery of participants' orders using a Cox proportional hazards model. This analysis confirmed the faster rate of recovery exhibited by Chinese participants. This aligns with many of the cultural characteristics defining this group, which suggest a greater tolerance to breach and a tendency to be more flexible and adaptable to changing situations (Morrison & Robinson, 1997; Trompenaars & Hampden-Turner, 1997).

Our research also contributes to our understanding of psychological contract breaches on attitudinal outcomes and across cultures. Complementing the findings on order behaviors, we observe, consistent with our expectations derived from the national culture characteristics, that Chinese subjects are tempered in their emotional responses and reticent to express any negative behavior toward their partner. As detailed above, results show that Chinese subjects' interactions with their supply chain partner were indeed restrained by more tempered order deviations. Furthermore, the emotional responses offered by this group are moderate compared to the U.S. We find this pattern of response consistent with the EVLN framework. The Chinese subjects in our sample appear to adopt a more metered stance in coping with supply disruptions due to psychological contract breach. In other words, they are adept at practicing patience and waiting for things to improve before voicing additional opposition to the partner (Thomas et al., 2003). This is observed in their order quantities, trust assessments, and repurchase intentions.

Also consistent with our expectations, we find that participants from the U.S. reported less trust in their supply chain partners and less of a desire to

repurchase from that partner again in the future. Our findings suggest that supply disruptions in the form of psychological contract breach are particularly damaging on multiple fronts where U.S. individuals are concerned. These breaches constitute affronts to the relationship that negatively affect otherwise rational decision making behavior as well as relational norms surrounding trust and commitment. This has important implications for supply chain relationship development and maintenance, as trust and willingness to work with a partner are critical to successful long-term relationships (Johnston, McCutcheon, Stuart & Kerwood, 2004; Wallenburg, Cahill, Knemeyer & Goldsby, 2011). Also of note, although their decision making behaviors (i.e., order quantities) evened back out relatively quickly, the less overt psychological implications appear to remain ingrained long-term within U.S. participants' perceptions of their partner. This finding is of critical practical importance, as it may pose threats not captured in the boundaries of this experiment. For example, Dirks, Lewicki and Zaheer (2009) believe that trust violations could lead to termination of the relationship, an avenue not possible in this experiment but certainly an option where alternative suppliers exist.

While these findings regarding the U.S. participants are important, they deserve further elaboration. Trust is a rich concept that embodies aspects of belief (Pruitt, 1981) and behavior (Luhmann, 1979). Trust-building is a process that unfolds along numerous dimensions, including those that are emotional (i.e., non-cognitive) and rational (i.e., cognitive), and is informed by other matters such as context (Doney et al., 1998). Some scholars argue that emotionally-driven responses to trust violations are temporary and that "after a time the perception would return to a rational perspective" (Schoorman et al., 2007). It may be the case in our research that emotional processing of the disruption leads to an immediate and reactionary response (lower order quantities), that further cognitive evaluation reveals to be irrational (the buyer's own profits are harmed by this approach). With a more nuanced measure of trust, we could potentially separate that which is attributable to emotional processing from cognitive processing. Our study is limited in that our measure of trust cannot inform us what might occur in a different context (such as that of continuing exchange or alternative suppliers), or over an extended time period. Further, as our assessment only represents trust in a single moment in time, we therefore do not fully capture developmental aspects that are informed by cultural norms and values. Certainly, there is much to learn about the role of emotional influences in trust perceptions and decision making (Schoorman et al., 2007).

Our results inform practice, as well, and indicate that managers should take special care towards understanding the psychological contracts being formed with their supply chain partners. The impact of psychological contract breaches can be felt directly (in the form of reduced order quantities in this case), and indirectly (in the form of lower trust evaluations and repurchase intentions). What we find particularly interesting is that all of the factors examined impacted at least one aspect of the exchange. While it is easy to point to the implications of lower order quantities, what we find possibly more concerning from a managerial standpoint is how exactly the assessments of low trust and repurchase intentions could manifest in an actual ongoing exchange relationship. If not order quantities, then what? Psychological contracts are by their very nature difficult to manage—they are idiosyncratic to the individual. Given the repercussions associated with a potential breach, however, management would be well-advised to do what is reasonably possible to make the terms of their exchange explicit. In this way, there is less opportunity for misunderstandings to occur. Further examination of socialization and information exchange processes in buyer-supplier exchanges could prove particularly useful in this regard, especially given the myriad relationships any given boundary-spanner is expected to manage at one time.

## LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

In this research, we conduct an examination of the impact of national culture on the responses of individuals to a distinct type of supply disruption: that due to psychological contract breach. Our results, while providing an important contribution to theory and practice, should be interpreted in light of the boundaries of this research effort. One consideration involves our measurements for the attributional assessments of trust and repurchase intentions. Due to our focus on national culture, our interest resided in a global measure of the trust construct. There is ample precedence in the literature for using single-item measures to capture globally assessed attitudinal variables such as those used in our research (Diamantopoulos, Sarstedt, Fuchs, Wilczynski & Kaiser, 2012), and in particular to assess overall trust (Searle et al., 2011). This general-level examination is consistent with the vast majority of research intersecting trust and cross-cultural psychology (Buchan & Croson, 2004). Repurchase intention is also commonly assessed with single-item measures, both within the presence of culture (Hewett, Money & Sharma, 2006) and otherwise (Mende, Bolton & Bitner, 2013). Certainly, while our research focuses on evaluation of global measures of

these attitudinal outcomes, future empirical research should investigate these concepts from alternative perspectives. As we previously elaborated, trust in particular offers countless opportunities for further examination, including an in-depth evaluation of trust and power dynamics and how they influence an individual's beliefs, and that individual's subsequent actions on behalf of their employer.

It is also important to understand that we characterize culture at the national level. This approach to modeling culture is common in the psychology and economics literatures (see Buchan & Croson, 2004), as well as operations and supply chain management literature (see Ozer, Zheng & Ren, 2014). The rationale is that cultural characteristics manifest as a central tendency within society, and although individual differences are sure to be observed, social norms serve to reign in vast deviations (Hofstede, 2010; Hofstede, Hofstede & Minkov, 2010). The observation has been made that globalization is blurring national boundaries and possibly diluting cultural distinctions to an extent (Fukuyama, 1995; Ralston, Holt, Terpstra & Kai-Cheng, 1997). In fact, we posit that a lack of differentiation in orders during the breach and the relatively quick restabalization of order quantities could be a reflection of this line of thought. That said, we do recognize use of a national lens is but one way to evaluate culture, and future research could opt to use individual-level scales to determine purely idiosyncratic, yet less generalizable, impacts of cultural characteristics on the phenomena observed.

Finally, although the use of undergraduate students for experimental research is sometimes questioned, we posit that our theoretical framework includes students within its boundary scope conditions, and that the coursework completed by each student and the training provided to them during the experiment further establishes suitability of the sample (Thomas, 2011). Moreover, this experiment was conducted with a group of MBA students, and revealed substantively similar results as those conducted with undergraduate students (Eckerd et al., 2013). This provides a level of confidence in our interpretations regarding the relationships under investigation (Stevens, 2011). This is also consistent with findings from other research using similar newsvendor-type ordering scenarios, in which there is no substantive difference in the ordering behaviors of managers versus undergraduates (Bolton, Ockenfels & Thonemann, 2012).

We believe there are multiple avenues for extending this line of inquiry. Our experiment matched a buyer with a single supplier, representing a situation tantamount to a lock-in. Alternative possibilities exist here, and it would be interesting to examine how the behaviors exhibited in this research might differ when multiple suppliers are available and supplier switching

is an option. An evaluation using this approach would be able to identify actual repurchase behaviors as opposed to the repurchase intentions we examine. More broadly speaking, the research investigating the intersection of psychological factors and supply disruptions is still nascent (Ellis et al., 2011). Future research could apply a psychological contracts perspective to decision making behaviors beyond order quantity adjustments in the face of supply disruption, for example recall strategy deployment (Ketchen et al., 2014). Finally, the possibilities for further exploration of the cultural aspects surrounding supply chain management exchanges abound. Following from this research, it would be interesting to see how the results extend to cross-cultural relationships (versus our cross-cultural comparison). Certainly, numerous opportunities exist for extending this line of research, refining our understanding of national culture, psychological factors, and their implications on the foundations of supply chain management.

## REFERENCES

- Allison, P. (1984). *Event history analysis: Regression for longitudinal event data*. Thousand Oaks, CA: Sage.
- Bachrach, D. G., & Bendoly, E. (2011). Rigor in behavioral experiments: A basic primer for supply chain management researchers. *Journal of Supply Chain Management*, 47(3), 5–8.
- Belmont Report. (1979). *Ethical principles and guidelines for the protection of human subjects of research*. Bethesda, MD: The National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research.
- Bolton, G. E., Ockenfels, A., & Thonemann, U. W. (2012). Managers and students as newsvendors. *Management Science*, 58(12), 2225–2233.
- Buchan, N., & Croson, R. (2004). The boundaries of trust: Own and others' actions in the US and China. *Journal of Economic Behavior & Organization*, 55(4), 485–504.
- Cachon, G., & Terwiesch, C. (2006). *Matching supply with demand: An introduction to operations management*. New York, NY: McGraw-Hill/Irwin.
- Choi, C. J., Lee, S. H., & Kim, J. B. (1999). A note on countertrade: Contractual uncertainty and transaction governance in emerging economies. *Journal of International Business Studies*, 30(1), 189–201.
- Dabic, M., Tipuric, D., & Podrug, N. (2015). Cultural differences affecting decision-making style: A comparative study between four countries. *Journal of Business Economics & Management*, 16(2), 275–289.
- Diamantopoulos, A., Sarstedt, M., Fuchs, C., Wilczynski, P., & Kaiser, S. (2012). Guidelines for choosing between multi-item and single-item scales for construct measurement: A predictive validity



- perspective. *Journal of the Academy of Marketing Science*, 40(3), 434–449.
- Dirks, K. T., Lewicki, R. J., & Zaheer, A. (2009). Repairing relationships within and between organizations: Building a conceptual foundation. *Academy of Management Review*, 34(1), 68–84.
- Doney, P. M., Cannon, J. P., & Mullen, M. R. (1998). Understanding the influence of national culture on the development of trust. *Academy of Management Review*, 23(3), 601–620.
- Eckerd, S., Hill, J., Boyer, K., Donohue, K., & Ward, P. (2013). The relative impact of attribute, severity, and timing of psychological contract breach on behavioral and attitudinal outcomes. *Journal of Operations Management*, 31(7/8), 567–578.
- Ellis, S. C., Shockey, J., & Henry, R. M. (2011). Making sense of supply disruption risk research: A conceptual framework grounded in enactment theory. *Journal of Supply Chain Management*, 47(2), 65–96.
- Finkel, S. E. (1995). *Causal analysis with panel data*. Thousand Oaks, CA: Sage.
- Fischer, R., & Mansell, A. (2009). Commitment across cultures: A meta-analytical approach. *Journal of International Business Studies*, 40(8), 1339–1358.
- Fiske, S. T., & Taylor, S. E. (1984). *Social cognition*. New York, NY: Random House.
- Fukuyama, F. (1995). *Trust: The social virtues and the creation of prosperity*. New York, NY: Free Press.
- Hendricks, K. B., & Singhal, V. R. (2003). The effect of supply chain glitches on shareholder value. *Journal of Operations Management*, 21, 501–522.
- Hendricks, K. B., & Singhal, V. R. (2005a). An empirical analysis of the effect of supply chain disruptions on long-run stock price performance and risk of the firm. *Production and Operations Management*, 14, 35–52.
- Hendricks, K. B., & Singhal, V. R. (2005b). Association between supply chain glitches and operating performance. *Management Science*, 51, 695–711.
- Hewett, K., Money, R. B., & Sharma, S. (2006). National culture and industrial buyer-seller relationships in the United States and Latin America. *Journal of the Academy of Marketing Science*, 34(3), 386–402.
- Hofstede, G. (1984). Cultural dimensions in management and planning. *Asia Pacific Journal of Management*, 1(2), 81–99.
- Hofstede, G. (2010). *Culture's consequences: Comparing values, behaviors, institutions and organizations across nations*. Beverly Hills, CA: Sage.
- Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). *Cultures and organizations: Software of the mind* (3rd ed.). New York, NY: McGraw-Hill.
- Hofstede, G. J., Jonker, C. M., & Verwaart, T. (2012). Cultural differentiation of negotiating agents. *Group Decision & Negotiation*, 21(1), 79–98.
- House, R. J., Hanges, P. M., Javidan, M., Dorfman, P., & Gupta, V. (2004). *Culture, leadership, and organizations: The GLOBE study of 62 societies*. Thousand Oaks, CA: Sage Publications.
- Javidan, M., Dorfman, P. W., DeLuque, M. S., & House, R. J. (2006). In the eye of the beholder: Cross cultural lessons in leadership from Project GLOBE. *Academy of Management Perspectives*, 20(1), 67–90.
- Johnston, D. A., McCutcheon, D. M., Stuart, F. I., & Kerwood, H. (2004). Effects of supplier trust on performance of cooperative supplier relationships. *Journal of Operations Management*, 22(1), 23–38.
- Ketchen, D. J., Wowack, K. D., & Craighead, C. W. (2014). Resource gaps and resource orchestration shortfalls in supply chain management: The case of product recalls. *Journal of Supply Chain Management*, 50(3), 6–15.
- Kimmel, A. J. (1998). In defense of deception. *American Psychologist*, 53(7), 803–805.
- Knemeyer, A. M., & Naylor, R. W. (2011). Using behavioral experiments to expand our horizons and deepen our understanding of logistics and supply chain decision making. *Journal of Business Logistics*, 32(4), 296–302.
- Lapalme, M., Simard, G., & Tremblay, M. (2011). The influence of psychological contract breach on temporary workers' commitment and behaviors: A multiple agency perspective. *Journal of Business and Psychology*, 26(3), 311–324.
- Lount, Jr., R. B., Zhong, C., Sivanathan, N., & Murnighan, J. K. (2008). Getting off on the wrong foot: The timing of a breach and the restoration of trust. *Personality and Social Psychology Bulletin*, 34(12), 1601–1612.
- Luhmann, N. (1979). *Trust and power*. New York, NY: Wiley.
- Matsumoto, D. (2001). Culture and emotion. In D. Matsumoto (Ed.), *The handbook of culture and psychology*. New York, NY: Oxford University Press.
- Mende, M., Bolton, R. N., & Bitner, M. J. (2013). Decoding customer-firm relationships: How attachment styles help explain customers' preferences for closeness, repurchase intentions, and changes in relationship breadth. *Journal of Marketing Research*, 50(1), 125–142.
- Morrison, E. W., & Robinson, S. L. (1997). When employees feel betrayed: A model of how psychological contract violation develops. *Academy of Management Review*, 22(1), 226–256.
- Ng, T. W. H., Feldman, D. C., & Lam, S. S. K. (2010). Psychological contract breaches, organizational commitment, and innovation-related behaviors: A latent growth modeling approach. *Journal of Applied Psychology*, 95(4), 744–751.
- Ortmann, A., & Hertwig, R. (1997). Is deception acceptable? *American Psychologist*, 52(7), 746–747.
- Oyserman, D. (2006). High power, low power, and equality: Culture beyond individualism and collectivism. *Journal of Consumer Psychology*, 16(4), 352–356.
- Ozer, O., Zheng, Y., & Ren, Y. (2014). Trust, trustworthiness, and information sharing in supply chains

- bridging China and the United States. *Management Science*, 60(10), 2435–2460.
- Padmanabhan, V., & Png, I. P. L. (1995). Returns policies: Make money by making good. *Sloan Management Review*, 37(1), 65–72.
- Page, P., & Chao, L. (2015). Firms gauge impact of devastating explosions at Tianjin port. *Wall Street Journal*, August 14, 2015.
- Perdue, B. C., & Summers, J. O. (1986). Checking the success of manipulations in marketing experiments. *Journal of Marketing Research*, 23(4), 317–326.
- Petersen, J. A., Kushwaha, T., & Kumar, V. (2015). Marketing communication strategies and consumer financial decision making: The role of national culture. *Journal of Marketing*, 79(1), 44–63.
- Pruitt, D. G. (1981). *Negotiation behavior*. New York, NY: Academic Press.
- Ralston, D. A., Holt, D. H., Terpstra, R. H., & Kai-Cheng, Y. (1997). The impact of national culture and economic ideology on managerial work values: A study of the United States, Russia, Japan, and China. *Journal of International Business Studies*, 28(1), 177–207.
- Ren, H., & Gray, B. (2009). Repairing relationship conflict: How violation types and culture influence the effectiveness of restoration rituals. *Academy of Management Review*, 34(1), 105–126.
- Restubog, S. L. D., Bordia, P., & Tang, R. L. (2007). Behavioural outcomes of psychological contract breach in a non-Western culture: The moderating role of equity sensitivity. *British Journal of Management*, 18(4), 376–386.
- Robertson, C., & Fadil, P. A. (1999). Ethical decision making in multinational organizations: A culture-based model. *Journal of Business Ethics*, 19(4), 385–392.
- Robinson, S. L., & Morrison, E. W. (2000). The development of psychological contract breach and violation: A longitudinal study. *Journal of Organizational Behavior*, 21(5), 525–546.
- Roth, A. V., Tsay, A. A., Pullman, M. E., & Gray, J. V. (2008). Unraveling the food supply chain: Strategic insights from China and the 2007 recalls. *Journal of Supply Chain Management*, 44(1), 22–39.
- Rotter, J. (1971). Generalized expectancies for interpersonal trust. *American Psychologist*, 35, 1–7.
- Rousseau, D. M. (1989). Psychological and implied contracts in organizations. *Employee Responsibilities and Rights Journal*, 2, 121–139.
- Rousseau, D. M. (1995). *Promises in action: Psychological contracts in organizations*. Newbury Park, CA: Sage Publications.
- Rousseau, D. M., & McLean Parks, J. (1992). The contracts of individuals and organizations. In L. L. Cummings & B. M. Staw (Eds.), *Research in organizational behavior* (pp. 1–43). Greenwich, CT: JAI Press.
- Rungtusanatham, M., Wallin, C., & Eckerd, S. (2011). The vignette in a scenario-based role-playing experiment. *Journal of Supply Chain Management*, 47(3), 9–16.
- Schoorman, F. D., Mayer, R. C., & Davis, J. H. (2007). An integrative model of organizational trust: Past, present, and future. *Academy of Management Review*, 32(2), 344–354.
- Schweitzer, M. E., Hershey, J. C., & Bradlow, E. T. (2006). Promises and lies: Restoring violated trust. *Organizational Behavior & Human Decision Processes*, 101(1), 1–19.
- Searle, R., Hartog, D. N. D., Weibel, A., Gillespie, N., Six, F., Hatzakis, T., & Skinner, D. (2011). Trust in the employer: The role of high-involvement work practices and procedural justice in European organizations. *International Journal of Human Resource Management*, 22(5), 1069–1092.
- Siemens, E. (2011). The usefulness of behavioral laboratory experiments in supply chain management research. *Journal of Supply Chain Management*, 47(3), 17–18.
- Speier, C., Whipple, J. M., Closs, D. J., & Voss, M. D. (2011). Global supply chain design considerations: Mitigating product safety and security risks. *Journal of Operations Management*, 29(7–8), 721–736.
- Stevens, C. K. (2011). Questions to consider when selecting student samples. *Journal of Supply Chain Management*, 47(3), 19–21.
- Thomas, R. W. (2011). When student samples make sense in logistics research. *Journal of Business Logistics*, 32(3), 287–290.
- Thomas, D. C., Au, K., & Ravlin, E. C. (2003). Cultural variation and the psychological contract. *Journal of Organizational Behavior*, 24(5), 451–471.
- Thomas, D. C., Fitzsimmons, S. R., Ravlin, E. C., Au, K. Y., Ekelund, B. Z., & Barzantny, C. (2010). Psychological contracts across cultures. *Organization Studies*, 31, 1437–1458.
- Triandis, H. C., & Gelfand, M. J. (1998). Converging measurement of horizontal and vertical individualism and collectivism. *Journal of Personality & Social Psychology*, 74(1), 118–128.
- Trompenaars, F., & Hampden-Turner, C. (1997). *Riding the waves of culture: Understanding cultural diversity in business*. London: Nicholas Brealey Publishing.
- Wakabayashi, D., & Luk, L. (2015). Apple Watch: Faultyaptic engine slows rollout. *Wall Street Journal*, April 30, 2015.
- Wallenburg, C. M., Cahill, D. L., Knemeyer, M., & Goldsby, T. J. (2011). Commitment and trust as drivers of loyalty in logistics outsourcing relationships: Cultural differences between the United States and Germany. *Journal of Business Logistics*, 32(1), 83–98.
- Wang, Q., Craighead, C. W., & Li, J. J. (2014). Justice served: Mitigating damaged trust stemming from supply chain disruptions. *Journal of Operations Management*, 32(6), 374–386.
- Westwood, R., Sparrow, P., & Leung, A. (2001). Challenges to the psychological contract in Hong

- Kong. *International Journal of Human Resource Management*, 12(4), 621–651.
- Wheeler, K. G. (2002). Cultural values in relation to equity sensitivity within and across cultures. *Journal of Managerial Psychology*, 17(7), 612–627.
- Zhao, X., Flynn, B. B., & Roth, A. V. (2006). Decision sciences research in China: A critical review and research agenda – Foundations and overview. *Decision Sciences*, 37(4), 451–496.
- Zhao, H., Wayne, S. J., Glibkowski, B. C., & Bravo, J. (2007). The impact of psychological contract breach on work-related outcomes: A meta-analysis. *Personnel Psychology*, 60(3), 647–680.
- Zhou, K., Poppo, L., & Yang, Z. (2008). Relational ties or customized contracts? An examination of alternative governance choices in China. *Journal of International Business Studies*, 39(3), 526–534.
- Zsidisin, G. A., & Smith, M. E. (2005). Managing supply risk with early supplier involvement: A case study and research propositions. *Journal of Supply Chain Management*, 41(4), 44–57.
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