Can a Girl's Best Friend be Born in a Lab?
The Role of Ritual in Production Process Conservatism

by

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Abstract

A number of studies suggest that people may care about the process by which a product is made, even when it is not associated with the quality of the product. A common example of this preference is "production-process conservatism," whereby consumers prefer products made via traditional practices rather than those made via new practices. However, it is not clear what mechanism drives such conservatism and it is difficult to rule out the possibility that it is due to differences in product quality. We focus on the context of diamond jewelry, where consumers have generally been resistant to diamonds that are identical to mined diamonds but are produced in a laboratory. We argue that this resistance derives from the use of a product in the performance of a social ritual, where deviation from the traditional rules of the ritual carries the risk that one will signal a lack of commitment or cultural competence. In particular, we expect consumers to be more resistant to lab-created diamonds when they buy diamond jewelry for an engagement gift, compared to when they buy diamond jewelry for a more routine gift. Our hypothesis is tested in a series of online experiments. The experiments provide evidence for our argument, and, in particular, females who ever married show the strongest resistance to lab-created diamonds in a ritual condition, compared to when they are in a gift-giving condition. We conclude by discussing theoretical implications of these findings and the mechanism underlying ritual reinforcement for future research.

Keywords: production process, ritual, risk, symbol, engagement, lab-created diamond

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Introduction

While it is generally taken for granted that it is the features of the end-product that determines demand, an increasing number of studies suggest that people care about production processes, not just about products. When making a choice in the market, consumers often seem to care about where, by whom and how a product has been made and pay a premium for the process they favor. Consumers may distinguish wines by the place of production (Benjamin and Podolny 1999), and they may care how farm produce has been treated by producers (Weber, Heinze, and DeSoucey 2008). Also, there are niche markets for beers from microbreweries (Carroll and Swaminathan 2000) and chocolates made with special recipes have recently gained popularity (Carroll and Wheaton 2008).

The salience of production process raises two questions. First, is it truly the case that consumers care about production process? Perhaps consumers attend to production processes as a proxy of product quality, but are otherwise indifferent to how a product is produced. It is difficult to address this issue because different production processes typically lead to different products. For example, grass-fed meat and dairy products may differ both in the social implications of the different production processes and also in the nutritional benefits of the end-product. And even when the difference in the end-products is not explicit, consumers may *perceive* a difference and act accordingly. For example, genetically modified organisms may not be problematic for consumers' health, as is suspected by many. Similarly, consumers may be willing to pay a premium for certain countries of origin (Loureiro and Umberger 2003) because they think such background labels signal differential quality even when they do not.

Nonetheless, other examples suggest that attention to production process cannot be reduced to a concern for product quality. Carroll and Swaminathan (2000:727) make a convincing case that

while mass producers' beer was indistinguishable from those produced by microbrewers, consumers paid a premium for beer produced by craft brewers. Also, while paintings or sculptures produced by famous artists are sold for high prices, duplicate that are physically indiscernible from the originals sell for much lower prices (Newman and Bloom 2012). Certain production processes are handed down from generation to generation not because they are associated with the product quality, but because production process shapes fundamental identity of the products or producing organizations. Initial resistance to nouvelle cuisine (Rao, Monin, and Durand 2003) in French restaurants is a good example of this case. Moreover, some studies demonstrate that production processes that are charged with an identity are continuously favored even when they imply lower quality (For example, see Barolos and Barbarescos in Negro, Hannan, and Rao 2010; and Kosher wine in Simons and Roberts 2008).

In these examples, production processes distinguish products by shaping product identity or authenticity, rather than product quality. Insofar as there are at least some production processes that people care about independent of product quality, this raises a theoretical question: then, why doesn't production process matter in *all* cases? Why it is only under certain circumstances that production processes become relevant to consumers' choices by shaping a dividing line of product? And more specifically, under what conditions will consumers be conservative with regard to their evaluation of production processes, in that they are reluctant to accept the very same product when it is produced by a new production process? The existing literature does not provide a clear answer to this question. One suggestion is that "domains" vary in the extent to which certain dimensions of value—including the production process—are salient (Podolny and Hill-popper 2004). But this begs the question of why such salience may vary. Similarly, it does not help to suggest that consumers have a high *taste for popular* items (Lieberson 2000; Lieberson and Lynn 2003) because it begs the

question of why production processes might sometimes be considered as a defining feature of an item.

In this paper, we argue that one potential answer to such variation may derive from social context, and we focus on the context of social rituals. In order to create common meanings and coordinate people's expectations, rituals utilize symbols (Chwe 2003; Durkheim 1976). When people perform rituals, they intend to express appropriate messages to one another by adopting these symbols. For example, parents place their presents under the Christmas tree to make sure their children understand that these are Christmas gifts (Caplow 1984; Swidler 2003). If we do not follow the rules, there is a risk that our message (e.g. love for children) is not properly understood. In cases when it is not clear to what extent rituals prescribe as a rule, it is a safer choice to adhere to the established forms.[3] Consequently, when products are associated with social rituals, it is reasonable for consumers to assume that if a product has always been made in a particular kind of way, then it may be problematic to use this product—even of exactly the same quality—when it is made in a new way. This is what we call the "production process conservatism." As long as it is ambiguous what the exact requirements are for an acceptable symbol, it is an individual's interest to adhere to established forms as much as possible (Chwe 2003; Schelling 1980). Accordingly, in ritual settings, the risk that seemingly irrelevant dimensions will be deemed relevant makes it more likely that they will indeed be relevant.

We develop and test this argument in the context of diamond jewelry. While diamonds have long been used in various forms of jewelry, there is a special segment of diamond jewelry—engagement rings—that is associated with rituals. As giving and receiving an engagement ring has become a

[3] For example, we all know black suits are required for funerals but it is not certain if black mini-skirts are appropriate. In that case, it is safer not to wear black mini-skirts in order not to risk the expression of condolence.

widespread ritual associated with marriage (Brinig 1990; Epstein 1982a; Kunz 1973; Rothman 1987), there are clear conventional social expectations in U.S. culture (and many other Western countries) about how to perform this practice—for example, what it should look like, on what finger women should wear it, and how much money men should spend on it (Spar 2006).

A recent technology shock in the production process of diamonds enables us to test our argument. While diamonds have long been sourced from deep mines, gem-quality diamonds are now synthetically produced in laboratory conditions with the exact same chemical, physical and optical characteristics as those of mined diamonds. There is no explicit rule with respect to production process for an engagement ring. But the advent of an alternative production process raises the question of whether the production process *is or is not* a part of the ritual rules. The primary objective of this paper is to test how such general perception on the alternative production process interacts with social context of rituals. As long as people make choices in ritual context, we expect that they will be careful about potential ritual rules in order to successfully perform the ritual and become conservative in accepting the new production process. Also, the diamond case is advantageous as a research site because we can disentangle the issues of quality uncertainty from people's resistance to alternative processes. Since mined diamonds and lab diamonds are both appraised by the same independent institutions using the same criteria known as "the 4Cs"—clarity, cut, carat and color, we can rule out the possibility that a particular production process reflects a difference in quality.

The rest of the paper will proceed as follows. We will first discuss the conceptual definitions of ritual rules and ritual products and develop the theory that leads to our hypotheses. We then use the theoretical comparison of a pure gift-giving with a ritual gift-giving to more clearly demonstrate why the same gift-giving behavior might cause higher risk in a ritual context. Next we focus on the

example of diamonds. We briefly summarize the traditional and the new alternative production process for diamonds, namely production process of a mined diamond and a lab-created diamond, and explain the ritual of giving and receiving a diamond engagement ring in the US. We then present the results of three online experiments, followed by general discussion.

Theoretical Framework

We begin by clarifying the following issues: 1) what is a ritual? 2) what are ritual rules? and 3) why do people follow ritual rules? We define rituals as a stylized set of actions through which people communicate messages and reach collective coordination. Rituals work as a public stage that clarifies participants' social role, socioeconomic status and/or social relationships in the eye of an audience. Rituals can be found in various settings, ranging from interpersonal social interactions (e.g. handshaking (Goffman 1955)) to the rites of passages for individuals (e.g. birthday, wedding or funeral etc), formalized social events of social entities (e.g. college commencement or coronation ceremony) or observance of traditions of a community (e.g. religious practice (Durkheim 1976), Halloween or Christmas).

In order to communicate messages through a large population, rituals consist of symbolic rules. If a performer of a ritual does not follow these rules, there is a risk that the performer's message is misunderstood, and perhaps cast a negative light. Ritual rules exist in various forms. Ritual rules might assign specific location or time for rituals or prescribe participants' physical gestures or verbal expressions. Among other things, we focus on products that are designated by the ritual rules and thus symbolize meanings associated with rituals. For example, in Western Christian culture, people wear black suits to funerals in order to show condolence. And Americans eat turkey at their

Thanksgiving dinners. In these examples, "black suits" and "turkey" are *ritual products* prescribed by the rules of the each ritual (Caplow 1984).

The symbolic rules are based on the following assumptions and work most successfully when they are all met: (1) there is an audience for the ritual, (2) the majority of the audience has prior knowledge on symbolic rules and (3) the audience interprets and evaluates the performer by his or her practice of the ritual rules, in compared with other performers. When these conditions are met but one does not follow the ritual rules, there is ***a risk*** that one's ritual practice sends a negative message about oneself. In other words, these conditions are also closely associated with the size of risk when ritual rules are broken. Let us briefly explain each of these conditions.

As early theorists argue (Douglas 2002; Durkheim 1976), rituals are social by-products, which presuppose an audience by definition.[4] The audience plays an important role in producing public knowledge that performers' social role, socioeconomic status or social relationships, once the performers successfully complete a ritual. The audience observes that the performer is capable of and committed to the meaning attached to each ritual. Consider classic examples from anthropology of hunter-gatherer societies. In the example of the Potlatch ceremony of the Kwakiutl, ritual performers show their economic competence by destroying their most valued items (Barnett 1938). In the Kula exchange, by joining the ritual performers publicize their social status, mutual obligations and hospitality (Malinowski 1920). Contemporary rituals play similar roles at various levels. By holding the traditional ceremony of changing of the guard at Buckingham Palace, Britain demonstrates the country's status and tradition in the eyes of the public. At the individual level, the purpose of a wedding ceremony (beyond the mere signing of a marriage license) in front of many

[4] While it is also possible that individuals internalize the meanings of rituals and practice rituals in isolation (e.g. pray alone or having turkey alone Thanksgiving), we would like to interpret this as having oneself as audience.

witnesses is to publicize the couple's entry into new social roles. Correlatively, a successful public event according to the social standards of an audience publicly signals the couple's cultural competence and their commitment to that audience.

Prior knowledge of the audience regarding ritual rules enforces the ritual rules over time. By providing a point of coordination, prior knowledge prevalent among the audience provides a sufficient condition for a symbolic rule to be followed and therefore be reinforced (Centola, Willer, and Macy 2005; Chwe 2003; Correll et al. 2012; Swidler 2003). As long as the majority of audience knows about a ritual rule, it works as a focal point (Schelling 1980) or conventional equilibrium (Elster 1989 Chapter 1). These refer to social rules where no individual can be better off by unilaterally deviating. Therefore, when there is a publicly known rule of rituals, a performer is not likely to deviate and ritual rules are likely to be reinforced through social interactions through rituals.

When a ritual rule is widely known to the public, it has even greater social force even when there is no functional reason behind the rules or when individual taste goes against the ritual rules. For example, while callers for condolence wear black suits in the Western cultures, people for the same ritual wears white clothes in some other cultures (e.g. traditional Korean funerals). Obviously color itself hardly provides a functional reason for the ritual of funeral but it is important to follow what is known to be the rule in each culture. Or, we can think of a situation where everybody in a birthday party does not like cake. Nonetheless, if we do not follow the widely known ritual rule of *birthday celebration with a cake*, it might confuse people. Without the ceremony of blowing out candles on a birthday cake, party attendants will be unsure when to say "happy birthday" and might feel not fully celebrating the birthday. Moreover, prior knowledge on ritual rules among the audience of rituals also works as a reinforcement mechanism. Having seen that people expect birthdays to be

celebrated with a cake, past party attenders will also prepare a cake when it is their time to perform the ritual. Consequently, ritual rules widely known and highly expected by audience become a tradition that passes on to later performers of rituals.

Lastly, ritual rules are followed because it becomes a basis for comparison and evaluation across ritual performers. The audience interprets a performer's quality by his/her shown conformity to the ritual rules. Since such shown observance of ritual rules provide agreed upon common metrics, it easily become a measure for a comparative quality, which often even overrides true quality (Espeland and Sauder 2007).

Therefore, insofar as there is audience who knows about the rules, each practice is subject to the audience's evaluation. For example, if you wear a colorful dress in a funeral, you risk being seen as having no sympathy for the dead person and be considered a rude person, regardless of your true state of mind. Disobedience to the rules of funerals will consequently harm your relationship with others, particularly with the family of the deceased, and most importantly, weaken your social status relative to your friends who dress appropriately. Similarly, consider a case where a man who wants to marry a woman did not follow the conventional rules of giving an engagement ring to the woman. Once this fact is known, the audience, including the woman who was proposed without an engagement ring, will compare his behavior to other guys who well-prepared an engagement ring to their fiancées and negatively evaluate his cultural competence or commitment compared to that of others who successfully followed the rules. His behavior might well raise a suspicion such as "does he really want to get married to her?" or "does he really love her?" and eventually there is a risk that the woman understands him as having no sincerity and rejects the proposal to get married.[5] Even if

[5] One possible exception to this case is that if the breaker has a legitimate reason not to know or not to practice the ritual rule, he/she might be protected from the negative evaluation. For example, if a person who is originally from a foreign culture asks for a marriage to an American woman without an engagement ring,

she agrees to marry him, he might be stigmatized as being under-invested or incompetent among the audience who share the story.

In sum, 1) the number of audience, 2) taken-for-grantedness of ritual rules and 3) the outcome of negative evaluation of ritual practice interrelate in increasing the ***risk*** associated with a ritual. When a large number of people are watching, it will produce strong public knowledge whatever the ritual performers do. In order to prevent from having a negative reputation known to everybody, ritual performers can be expected to pay extra attention to the ritual rules.

When a ritual is taken for granted by a large number of people, there develops a stronger expectation that performers will conform to the rule. Prior knowledge of ritual rules will works as a social "focal point" that a single individual have no incentive not to follow, even if he/she personally disagree with the ritual rule. Through social interaction between audience with expectation on ritual rules and the performer conforming to the rule, ritual rules are reinforced and are passed on to later generations of ritual performers.

The riskier the potential outcome when the ritual rules are violated, the less likely that performers disobey the rules. By displaying observance of ritual rules, audience evaluates a ritual performer to other ritual performers. When one's ritual performance is relatively worse than others, he/she will have to take the negative outcome from the low evaluation. Therefore, it is more likely that a performer will care about ritual rules when the stake is high.[6]

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he would not offend the US audience as much as other American men with the same behavior would do, because he is being *understood* as having no prior knowledge or no cultural commitment for the ritual rules.

[6] For example, compare a case of an engagement and a birthday. If you fail to perform the ritual rules associated with birthday celebration, the negative outcome is that the audience (including the birthday girl/boy) might think you do not have sincere feelings for the birthday girl/boy. If you fail to perform the ritual rules for an engagement, the stake is that you might be considered low-committed to the engagement and in the worst case, the woman might reject the proposal. Compared to the worst outcome of a wrong birthday celebration, the worst outcome of a wrong engagement has more impact.

Rituals in comparison with pure gift-giving

Gift-giving is comparable to rituals in a sense that it also symbolically represent some qualities of performers (Camerer 1988; Mauss 2006). While they are not mutually exclusive concepts,[7] a comparison of a gift-giving without ritual implication (e.g. a surprise gift) and gift-giving in ritual context (e.g. engagements) offers a good opportunity to show the effect of rituals relative to a pure gift-giving context.

In a pure gift-giving context, the aforementioned three conditions are only ***weakly*** met, at best. The audience is typically smaller, and it may often consist only of the giver and receiver. This means that no matter how the gift-giving is done, whether it was a great choice of a gift or a disastrous one, it has a weaker impact in transmitting public knowledge on the performer's reputation. Compared to this, a ritual such as marital engagement enlists a much larger audience. Oftentimes, engagement gifts are presented in front of some extra audience, whether it is family or it is an unspecified number of the general public. And even when an engagement gift is given in private, the story of giving an engagement gift tends to be remembered and shared with others. Indeed, when encountering a friend who is wearing a new engagement ring, it may be considered rude *not* to ask about the ring and the manner in which it was presented.

Also, the knowledge of what constitutes a good gift is less well-established. If a man is buying an engagement gift, people expect it to be a diamond ring. If the same man is buying a surprise gift for his fiancée, diamond jewelry is one of many possible choices, while there are many other appropriate options. There may be many proscribed options in each case, but there is a much narrower set of prescribed options in the case of engagement.

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[7] Some rituals include the gift-giving (e.g. engagement), while some other rituals do not. Likewise, some gift-giving contexts are associated with rituals (e.g. Christmas, engagement), some others are completely irrelevant to rituals (e.g. a surprise gift).

Lastly, the negative outcome expected from a poorly chosen gift has much less impact than that of a bad or wrong engagement gift. If you pick a wrong engagement gift, your behavior will be easily codified, evaluated and compared to other performers. Eventually, it might consequently produce a different outcome that you would not otherwise be led to (e.g. rejection of an engagement) or produce a public stigma more effectively.

In sum, although a pure gift-giving bears a similarity to an engagement gift-giving, ritual settings have much higher risk in a sense that ritual settings are more easily evaluated and the expected outcome of wrong performance is much more devastating.

Production Process as a Part of Ritual Rules

In this paper, we investigate the possibility that when people suspect that the production process may be interpreted as part of the rules of a high-stakes ritual, they will resist a new production process, even when: (a) there is no explicit rule regarding production process; (b) the alternative production process offers clear benefits; and (c) the product produced via the new production process is identical to that produced via the traditional production process.

We believe that a *possibility* that production process is a part of the ritual rules is a sufficient condition to invoke behavioral conservatism in ritual performance. In fact, production processes are often but not always a part of symbolic rules in performing rituals. Kosher food and Halal food, which have to be prepared in a specific way following religious prescriptions, are good examples of cases where production processes are part of the ritual rules. Alternative production process, regardless of how much they are technologically advanced or efficient, cannot be accepted as long as the ritual rule defines the traditional production process as the only right way.

But when production processes are not proclaimed as a part of ritual rules, it is quite possible for the production process to be ignored. For instance, Americans do not seem to care how the turkey for Thanksgiving dinner is raised or butchered. Yet consider a situation where there has been only one way of producing the product, to the point that the product is defined in terms of the production process. For example, for a long time, diamonds were always produced from underground mines. If you were to ask contemporary Americans to define or describe a diamond, they are likely to tell you that they are mined. As a result, the production process has been strongly coupled with the ritual. And with the advent of a new production process, it is uncertain whether it *is* or it is *not* a part of the ritual rule. Prior to the arrival of lab diamonds, there was no need for clarification on this point simply because there was no variation. After some time has elapsed after the introduction of lab diamonds, it might turn out that production process is an important part of the ritual rule and only the traditional way of production process is allowed for ritual products. Or, it could also be the case that production process is not a critical part of ritual rules and the new production process is accepted to ritual products. But at present, there is no way of knowing for certain.

In this paper, we use this context to test our argument. That is, we hold constant the coupling of the production process with the product, and we vary the extent to which the product is used, whether it is (high-stakes) ritual context or a non-ritual context. This provides a conservative test for our argument that when products are associated with rituals, people are less accepting of products made from a new production process than they are for products not associated with rituals. If production process were already an important part of the ritual rules, one might naturally expect that people would not accept the new production process. But the implications are unclear when production process has not been an explicit part of the ritual rules but where the product has been defined in terms of a particular production process. In this case, especially insofar as the alternative production process provides clear advantages, then a dilemma arises. On the one hand, if production

process turns out *not* to be a part of the ritual rules, choosing the alternative production process would not harm the performance of rituals but only give some economic benefits. On the other hand, if the production process turns out to be an important part of ritual rules, choosing the products from the alternative production process accompanies the risk of negative outcome from failing the ritual.

We argue that the latter consideration should weigh heavily whenever the stakes of the ritual are particularly high. Under those conditions, as long as there remains the possibility that audiences may regard the production process as part of the ritual rules, we expect people to avoid using products that are made via the new production process. By showing that people are conservative about production process even when it is only *possibly* a ritual rule, we attempt to provide a rigorous test for our argument.

Production Process of Diamonds—Past and Present

Mined diamonds and Diamond Pipeline

Diamonds have a particular processing and distribution structure, often called the *diamond pipeline*, which can be distinguished from other materials or other natural resource. Since such specific features in the production process have considerably contributed to the historical image of the end-product, we briefly explain the full process.

Until recently, gem-quality diamonds have always been sourced from nature, mostly from underground mines. Diamonds are formed deep in the earth, about 140-190 kilometers or 87-120 miles, when carbon is subjected to high pressure and high temperature. *Kimberlite*, a type of volcanic rock, is known to be the major, if not sole, source of diamonds. In the exploration stage, producers try to find these kimberlite pipes and go through a geological analysis of minerals to find

a diamond-bearing kimberlite, and assess whether the kimberlite is a commercially viable source of diamonds.

The production of rough diamonds is a highly concentrated industry both in terms of country of origin and of number of firms involved. While diamonds have been discovered in over 35 countries, Botswana remains the largest producer by value (26%), followed by Russia (19%), South Africa (12%) and Canada (10%). The world's five largest corporate diamond industry players—De Beers (43%), Alrosa (19%), Rio Tinto (7%) BHP Billiton (6%) and Aber Diamonds (2%)—control 77 % of world production in total (Even-Zohar 2007:166–168).

Moreover, there is a long history of cartel behavior, led by De Beers. Rough diamond stones are purchased by small traders or by the Diamond Trading Company (DTC), which is the distribution arm of De Beers. While DTC has long been almost the monopolist supplier, its market share is known to have decreased to around 50 percent. Rough diamonds are sorted based on various characteristics that would determine their value when they are processed, and sold either through the *sightholde*r system, tenders, and spot sales. Designated by De Beers, sightholders are the only dealers who can transact with DTC on "sights," which DTC hosts approximately ten times each year. At such sights, sightholders are offered bundles of diamond stones, called "boxes", but it is impossible for them to negotiate prices or shop around for the desired quality. All sightholders can do is either accept or reject the offer.

In the processing stage, diamonds are cut and polished from rough stones into finished gems. This process is highly labor intensive and competitive where thousands of small players populate this segment of the diamond industry, particularly in New York, Antwerp, Tel Aviv and Mumbai. In preparation for being manufactured into jewelry, finished stones are graded by organizations such

as the Gemological Institute of America (GIA), International Gemological Institute (IGI) or American Gem Society (AGS).

These polished diamonds are then turned into diamond jewelry. Diamond jewelry manufacturers tend to be located close to the end market, while some manufacturers are vertically integrated into retailing. The US is the single largest diamond consumer market. American consumers annually spend $32-34 billion on diamond jewelry and the diamond content in the jewelry sold in the US comprises $8.5 billion. This represents half of worldwide polished diamond consumption, followed by Japan, the second largest market, which represents about 15% of world retail sales (Even-Zohar 2007).

Lab-created Diamonds

Diamonds produced by an artificial process, as opposed to natural diamonds created by geological processes, are called *lab-created* diamonds, and are also known as *lab-made diamonds*, *synthetic diamonds,* or *cultured diamonds*.[8] The production process of a lab-created diamond represents a sharp contrast to that of mined diamond. While mined diamonds rely on natural resources and specialized labor all around the world, lab-created diamonds are based on technology. It has been possible since the 1950s to synthetically produce diamonds, but it was only in the past decade that technology reached the level to produce gem-quality diamonds. Nowadays it is possible to make colorless lab-created diamond gemstones that are chemically, physically and optically identical (and sometimes superior) to naturally occurring ones. It is important to stress that synthetic diamonds are different from inexpensive diamond alternatives such as cubic zirconium or moissanite. These stones bear some visual resemblance to diamonds but have a completely different molecular structure. By contrast, lab-created diamonds are chemically equivalent to mined diamonds.

[8] In this paper, we use "lab-created diamond" and "lab-made diamond" interchangeably.

Lab-made diamonds for use as gemstones are mostly grown by one of the two methods. High Pressure-High Temperature (HPHT henceforth) replicates the natural geologic process. General Electric first introduced gem-quality lab made diamonds in 1970 using this method. In the first stage of this process, small seed diamonds are placed into a machine, covered with a mixture of catalyst metal and graphite powders. Then the machine replicates the natural geologic process, raising temperatures up to 2,500 degrees centigrade and pressure up to 60,000 atmospheres. In the second method, chemical vapor deposition (CVD henceforth), manufacturers create diamond crystals in a low-pressure environment using carbon-bearing gases. The process involves depositing a carbon vapor onto a substrate to grow the stones. While there are six to eight manufacturers known to produce gem-quality lab-diamonds, Gemesis (based in Sarasota, Florida) is known to have the largest capacity for producing several thousands of carats of lab-created diamonds a year, using both HTHP and CVD. While lab-made diamond accounted for more than 90% of the industrial diamond consumption (Olson 2000), it is estimated that lab-created diamonds represented only 0.01% of U.S. diamond gemstones sales in volume in 2010 (Bain & Company 2011:75).

The ritual of engagement and the production process for diamond jewelry

Diamond as a symbol of an engagement

"As a worldwide dealer in enchanting illusions, Disney has nothing on De Beers

(The Economist 1997)"

While the first well-documented evidence of a diamond ring to signify engagement dates back to 1477 when the Emperor Maximilian of Austria got engaged to Mary of Burgundy (Brinig 1990; O'Rourke 2007), it was not until the late nineteenth century that average Americans started to give or receive diamond engagement rings; and until the early twentieth century (before the Depression), diamond rings were not considered a requisite for betrothal by most American brides and grooms

(Brinig 1990; Epstein 1982b). Nevertheless, by 1965, over 80 percent of all US brides received a diamond engagement ring (Brinig 1990; O'Rourke 2007; Ward et al. 1981); and today, a diamond ring is widely regarded as an inseparable part of courtship and engagement.

The practice of giving and receiving a diamond ring in the process of engagement can be traced to the successful efforts of De Beers and its marketing agency N.W.Ayer to invent this ritual. With decreasing sales of diamonds in early twentieth century, De Beers consulted N.W Ayers to devise a marketing strategy. After collecting data from the market and scholars, N.W. Ayer started to invent the ritual through a well-orchestrated advertising and public relations campaign, including the famous slogan of "A Diamond is Forever" (Epstein 1982b).[9] Through a large-scale investment in marketing over a long time, a diamond ring became virtually synonymous with engagement among Americans.

And as giving and receiving an engagement ring has become a widespread ritual associated with marriage (Brinig 1990; Epstein 1982a; Kunz 1973; Rothman 1987), conventional social expectations—or "ritual rules"—have emerged for how to perform this practice (Spar 2006). Since the technological shock in production process is very recent, it is not yet clear whether production process is a part of the rules or not. However, as long as diamond is used for ritual purposes, there remains the possibility that production process become a part of the ritual rules; and if so, the rule

[9] The following except from a report written by sociology professor James Bossard for N.W.Ayer well demonstrates the target image of a diamond ring as a public medium of ritual messages that the giver's economic capability and commitment to the relationship: *The engagement ring . . . is a symbol of the ability to get your man in the competitive race. . . . It has the further features that it is not easily given (too expensive), it is visible (it sparkles), it is permanent (other things wear out), and it advertises the economic status of the giver. . . . Large scale society makes for impersonal relations. One result of this is to place marked emphasis upon outward manifestations and visible evidence. . . . Conspicuous consumption becomes more impressive than quiet confidence. . . . Symbols are indicators of status.... A formal and visible symbol of approaching marriage becomes a vital necessity in a large office, a big university, a large plant* (From a N.W.Ayer report written by James Bossard; from Epstein 1982b: pp130)

would define only the traditional way of production as appropriate for rituals. Therefore, we argue that when people purchase a diamond for an engagement they will be more conservative about production process, compared to when they buy the same diamond for a more routine gift.

Hypothesis: When diamonds are associated with marital engagement, people are less accepting of lab-created diamond than when diamonds are not associated with a high-stakes ritual.

Empirical Evidence

To test this hypothesis, we designed a series of experiments on Amazon Mechanical Turk (AMT henceforth). AMT is an online website where researchers can recruit subjects with a monetary reward upon completion. It has been found that AMT provides a reliable pool of subjects and is a useful resource for experimental research (Mason and Suri 2012; Paolacci, Chandler, and Ipeirotis 2010). The purpose of the Pretest 1 was to examine whether people care about production process when the objective measure of quality is identical with three different sets of items, and whether diamonds are thought as a ritual product. In Pretest 2, we ran a more direct test to see if subjects make a price discount when they care about production process. Finally, we tested our main hypothesis in Main Study, where subjects are assigned to either a ritual setting or a non-ritual setting and asked to make behavioral decisions for their purchase recommendation.

Pretest 1 and Pretest 2: Expected market value for products made from non-traditional production process

In Pretest 1, we aimed to confirm a few assumptions that underlie the test of our theory in the main study. First, we wished to calibrate the extent to which consumers care about production process for

diamonds against how much they care in other cases, where a new production process can produce the same quality product as a traditional production process. Second, we wished to confirm that diamonds are associated with rituals. Third, we aimed to see how consumers evaluate the alternative production processes when the objective measure of quality is same, and how it is translated into price discount.

While the production process is associated with the differences in expected market value in Pretest 1, it does not guarantee a causal relationship or not. Therefore, in Pretest 2, we replicated and further developed the experiment on diamonds in Pretest 1, to provide a stronger support that it is indeed a causal relationship (we explain in detail in the method section below). We attempted to clarify the difference in price discount between subjects who focused on production process and subjects who did not focus on production process. We achieved this information by asking follow-up questions after each subject answered to the question of expected price for a product made from an alternative production process.

Method

Six hundred and seven subjects were recruited through AMT and complete a survey with $0.25 compensation. Subjects with educational level higher than high school graduation and who live in the US were eligible for our survey. Pre-test 1 was conducted as a between-participant design where subjects were randomly assigned to a survey either on diamonds, wine or Wagyu beef, which are examples of items that have objective measure of quality and two different production processes—a traditional production process and a new alternative production process. At the beginning of the survey, subjects were told that the purpose of the survey is to know how to display and value items to develop an online game and they will be given questions on one of many items.

Diamonds have an objective quality measure of 4Cs, and can be mined or produced from the laboratories. Wines have expert (blind taste-test) ratings as the measure of quality and we used an example of Californian sparkling wine that adopted French methods and original French Champagne. Finally, we also used the example of original Wagyu beef from Japan compared to Australian Wagyu beef where they are both graded by their marbling and maturity measures in the USDA rating. In the questionnaires, subjects were given such information on the item to which they were assigned.

The survey questionnaire was a combination of our focus questions, questions to give relevant information and questions to hide the real purpose of the survey. In the focus questions, we first asked how much each item was associated with special occasions in the five-point scale. Later, subjects were given descriptions of two products where objective quality is almost same but slightly different in dimensions unrelated to quality and were asked if diamond jewelry made from a mined diamond [Champagne/Wagyu beef from Japan] is sold for $10,000 [$100/$30], how much they expect the piece made from the lab-created diamond [Sparkling wine/Wagyu beef from Australia] will sell for. Figure 1 shows an example of these product descriptions. While the basic idea was to provide two items identical except for the production process, in order to avoid demand effect, we made slight adjustments in product properties so that the contrast of production process was not explicit. In order to check the effect of our adjustments of product properties, we counterbalance the effect of those differences. For example, to the half of diamond survey respondents, description A was given as a mined diamond and description B was given as a lab-created diamond. To the other half of the respondents, we flipped the description and description B was shown as a mined diamond.

****Insert Figure 1 about here****

In order to give relevant information to subjects, they were given a series of questions that they had to read and demonstrate understanding. For example, they were told that "color, cut, carat and clarity, widely known as the 4Cs, are the standard ways of evaluating a diamond" and asked "if you were buying a diamond, which would you think is the most important?" Similarly, subjects were given information about the alternative production process from the questions. While the answers in these questions were not necessarily important for the research purpose, the goal here is to give respondents relevant knowledge. Additionally, the survey also included questions unrelated to our purpose of the research —for example, "which of these do you think is the most typical look of a diamond ring?"—in order to make the flow more natural and to make the cover story more credible.

One disadvantage of giving subtle contrast of production process when asking the expected price was that we cannot know how many of the subjects were actually paying attention to our subtle manipulation, and how that makes a difference in the result. Pretest 2 replicates and extends the diamond module of Pretest 1, in order to clarify subjects' attribution when they made price expectations for the lab-created diamond. An additional 388 subjects were recruited from AMT. In addition to questions asked in Pretest 1, they were further asked the main reason for their price expectation, after they answer the expected price for the lab made diamond,

Result and Discussion

In Pretest 1 and Pretest 2, we had three predictions. First, we expected that people think of diamonds as more strongly associated with ritual than the other two items. Second, we expected that in all of the items, people care about production process independent of quality. Third, we expected that in the case of diamonds when people do care about the production process, they demand or expect a price discount for the alternative production process.

All three predictions were supported. Regarding the first question of how much each item is associated with special occasions, diamonds showed the strongest association in the five-point scale among the three items. In paired t-tests, diamond showed significantly stronger association with special occasions, supporting our first prediction ($M_{diamond}$=1.52 vs M_{wine}= 2.54, t(470)=-12.38, p<0.001 ; $M_{diamond}$= 1.52 vs M_{beef}=2.55, t(465)=-12.11, p<0.001, where 1= very strong association and 5= no association at all). This result supports our expectation that diamonds are a good example of a ritual product.

Consistent with our second prediction, the result showed that in all the three items, subjects cared about production process independent of quality and expected significantly lower price for the products made from the alternative production process (see Table 1). Compared to $10,000 for a mined diamond, subjects expected $8690 for a comparable lab-created diamond. It showed a significant difference, as the 95% confidence interval ranged from $8300 to $9081. Also, compared to $100 Champagne, sparkling wine with same rating was expected to be sold for $78 on average (95% C.I [73.86, 82.83]) and compared to $30 Wagyu beef from Japan, the expected price for Wagyu beef from Australia was $28.19 (95% CI [27.19, 29.20]). Also, since there was no significant difference in price expectations by the counterbalance, we could conclude that the pairs of quality measure in our product descriptions were successfully manipulated to represent same quality yet to be slightly different.

*** Insert Table 1 about here***

Although we could observe overall price discount in all of the three items, it caught our attention that significant percentage of subjects (about 20 percent) expected even higher price for products made from alternative production processes (See Table 2 below). This raised a suspicion that a

considerable number of subjects might have focused on properties other than the production process and used them primarily for their price expectation.

Insert Table 2 about here

Additional experiments on the diamond module in Pretest 2 address this suspicion. After the expected price question, they were asked a follow-up question "what was the main reason you thought Diamond B would sell for a lower [a higher, an equal] price?" As shown in Table 3, about half of the entire subjects focused on production process (197 out of 388) and when subjects cared about production process, they were more likely to discount the expected price of Diamond B ($\chi^2(1)=104.68$, $p<0.001$). Significant price discount was also confirmed by the T-test (see Table 4), where the average expected price from subjects who mainly cared about production process was $7075.21, compared to the expected price of $9791.81 from those of who did not pay attention to production process ($t(317)=12.97$, $p<0.001$).

Insert Table 3 about here

Insert Table 4 about here

In sum, the results from Pretest 1 and Pretest 2 strongly support our three predictions. In Pretest 1, we found that there is a general tendency that people care about production process from which products are made and alternative production processes are expected to have lower market value, compared to the original production process. Pretest 2 confirmed the preliminary finding from Pretest 1, by showing that subjects who primarily cared about production process of diamonds expected significantly lower price for lab-created diamonds than subjects for whom production process was not the main reason for price expectation. Also, the fact that diamonds were considered

to be strongly associated with special occasions demonstrated that diamond is an appropriate example of "ritual product" to be used for our research question.

Main Study: Ritual and the production process conservatism

The primary objective of Main Study is to test our main hypothesis that consumers will be less accepting of the new production process in ritual settings, in order not to deviate from taken-for-granted ways of ritual performance and therefore not to send out a problematic message.

In Main Study, instead of asking expected price, we asked subject's behavioral choice—whether they would buy a mined diamond or a lab-created diamond—given that they can get a bigger diamond if they choose a lab diamond. Considering subjects' idiosyncrasy in personal preference or life experience, we asked their behavioral choice in the form of an advice for a friend who is buying either an engagement gift or a surprise gift. We believe this type of question can better address consumers' response in the real world, as subjects were primed with actual involvement. It also addresses the problem that not all subjects were actively involved in the purchase of a diamond at the time of the survey.

We had two related predictions that emerged from our hypothesis. First, we expected that the odds of choosing a mined diamond would be significantly higher in the ritual setting than in the non-ritual setting. Second, we also expected that the rate of choosing a mined diamond versus a lab diamond would be more distinctive in the engagement condition than in the gift-giving condition. In addition to the social context treatment—whether subjects are primed with an engagement setting or a gift-giving setting—we expected that marital experience and gender might moderate the effect.

Method

Six hundred and forty four subjects were recruited through AMT and completed a survey with $0.25 compensation each. The survey was constructed as a between-subject experiment where each subject is randomly assigned to either ritual setting or a non-ritual setting. At the beginning of the survey, subjects were told that the purpose of the survey is to develop an online shopping game and they will be given questions on one of the items. In practice, all the subjects were given questions on diamonds.

The key treatment between the settings is that in the ritual setting, subjects are led to think of an engagement context where they ultimately have to give an advice to an imaginary friend who is buying diamond jewelry for *an engagement gift*. In the non-ritual setting, subjects are led to imagine that they are giving an advice about diamond jewelry purchase for a friend who is buying *a gift*. The description of this imaginary friend is identical in both settings as "a 32 year old male friend, who lives in Chicago and has been in a serious relationship with his girlfriend for 2 years."

Similar to our previous experiments, we gave questions that subjects had to read and understand, in order to give relevant background knowledge for the experiment. For example, in a series of questions subjects read that it is now technically possible to produce grow diamonds in laboratories and these lab-crated diamonds have the exact same chemical, physical and optical characteristics as mined diamonds, and while a mined diamond and a lab-created diamond are identical in 4C measures they are indistinguishable to the naked eye, lab-created diamonds are laser inscribed with an identity name and number and are also declared in the certifications.

After they were given information on lab diamonds through questions, subjects were asked whether lab diamond should sell for the same price, a higher price or a lower price than a mined diamond.[10] If they think a lab diamond should sell for a higher or lower price than a mined diamond, they are asked to gauge how much should higher or lower in price should the lab diamond be (e.g. 10% more, 25% more ...).

In the next section, subjects are given descriptions about the specific design and the profile of a mined diamond that "the friend" chose to buy. Based on this description, subjects were asked to guess how much each of these diamonds would cost and how much the imaginary friend's annual income would be.

Finally, in our key question, subjects were told that the jeweler tells the friend that the exact jewelry can also be made with a lab created diamond and if he chooses to make it with a lab diamond, he can get a bigger diamond for the same price. Given this, subjects are asked whether they "would recommend that he buy a mined diamond" or they "would recommend that he buy a lab-created diamond", or their "recommendation would depend on how big a lab-created diamond is."

Result and Discussion

Main analysis. We ran a T-test of proportions *between* the choices of diamond in each social context, and between the choices of same diamond *across* social context manipulation. To the question "which one would you recommend that your friend buy?": in the gift-giving condition (N=323), 38.7% of the subjects (N=125) chose a mined diamond and 34.37% (N=111) chose a lab diamond. In the engagement condition (N=321), 43.61% of the respondents (N=140) answered they would recommend a mined diamond and 33.33% (N=107) chose a lab diamond.

[10] The order of appearance was counterbalanced so that "lab diamond" or "mined diamond" would not be chosen simply because it appears first.

***Insert Figure 2 about here ***

Although the percentage of subjects who chose a mined diamond is higher in the engagement condition (43.61%, compared to 38.7% in the gift-giving condition), this gap is not statistically significant; this means that the effect is not strong enough to support our first prediction. However, we found evidence to support our second prediction. While the % difference between the two choices was not significantly different in the gift-giving condition, there was significant higher choice for a lab diamond in the engagement condition (p-value=0.007). This result supports our prediction that subjects would display differential preference for production process by social context, and they will prefer mined diamonds in the ritual context.

To further explore the moderating effect of gender and marital experience, we ran a series of logistic regression. The main purpose of the regression analysis is to figure out to whom the ritual effect is most strong. We investigated whether gender and/or experience in the engagement ritual (in other words, marriage experience) have an effect on subjects' attitude toward production process of diamonds.

For the dependent variable, we created a dichotomous variable "recommendation" where it is 1 if subjects answered that they would "recommend a mined diamond" and is 0 if subjects answered that they would "recommend a lab diamond" or answered that their "recommendation would depend on size difference".[11]

[11] Since there were three choices in our key question, we had to merge them into two in order to run a logistic regression. By merging "my recommendation depends on how big a lab diamond is" with those who recommended a lab diamond, the dichotomous variable means either any acceptance to the alternative production process (=0) or strict rejection to the alternative production process (=1). Alternative approaches to this type of choice set would be ordered logit or multinomial logit, without merging the choices. However, since there is no guarantee that out choice set would satisfy proportional odds assumption (for ordered logit) or independence of irrelevant alternatives assumption (for multinomial logit), we did not use those methods.

In the models, we controlled for marital status, gender, age, and price expectation. The reference category for marital status variable is "now married", and the relative effect is calculated by "widowed", "divorced", "separated" and "never married" categories. The gender variable equals 1 if it is female and equals 0 if male. The age variable is divided into quartiles where the second quartile is the reference category. Price expectation shows whether each subject "expected mined diamond to be more expensive", "lab diamond to be more expensive", or "both to be equally priced". The majority (87%) expected that mined diamonds is more expensive than lab diamonds. In the model, we put dummies for those who expected lab diamonds to be more expensive or expected equal pricing. We also checked the interaction effect of ritual effect and marital status, as well as separate models for each gender.[12]

***Insert Table 6 about here ***

In Model 1 through Model 4, the price expectation variable shows strong explanatory power. This means that if subjects don't expect mined diamond to be more expensive, they are less likely to recommend mined diamonds. Also, the oldest age group (age_q4) showed preference for mined diamonds.

As Model 1 shows, controlling for price expectation, subjects' recommendation was not significantly different by social context. However, when we added the interaction terms for social context and marital status, there is a significant ritual effect for subjects who are now married (reference group); never married subjects showed significantly lower ritual effect than now-married subjects.[13] To see how this effect works for each gender, we divided into females and males. While

[12] For summary statistics and correlation of the variables, please see Table 5.
[13] We also ran models with a dichotomous variable "ever-married", where subjects are grouped into either ever-married (combining now married, widowed, separated and divorced) or never-married. These models

the ritual effect among ever married subjects holds for females (Model 3), there was no effect for males (Model 4).

While we did not establish ex-ante hypotheses about moderating effects of gender and marital experience, this result can be understood in terms of our theory. Marital experience is related to the level of knowledge about engagement rings, and the level of knowledge about social risk associated with the ritual. Although giving a diamond ring is a widely practiced ritual, unmarried people might not exactly know what they should care about engagement rings or what kind of social consequences their choice would have. In other words, until they go through the ritual by themselves, people might not know where the social risk comes from and/or how impactful the risk is.

Also, males and females learn different types of social risk throughout the ritual process. They play different roles in the ritual practice of giving and receiving an engagement ring; in most cases, men initiate the ritual by purchasing an engagement ring and women complete the ritual by receiving the ring and convey the ritual meaning in the public by wearing it thereafter. As a result, they might face different levels of social risk. To illustrate, men face a risk of showing his competence and cultural capability immediately to the women and implicitly to the public. Women, once they accept the ring and wear it in the public eye, face a risk of ensuring the couple's competence and capability against social comparison.

In summary, we found some evidence for our prediction that people would be less accepting of the alternative production process, namely lab-created diamonds, in a ritual setting than in a non-ritual setting. As shown in Figure 2, there was a significant preference for mined diamonds over lab

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showed the same result; ever-married subjects showed significant ritual effect, while never married subjects did not.

diamonds in the engagement condition, whereas the difference was unnoticeable in the gift-giving condition. This difference was not statistically significant once we adjusted for the subject's expectation regarding the relative prices of mined versus lab diamonds. But further regression analysis showed that the ritual effect is statistically significant among married subjects, especially married women—i.e, those who have gone through the engagement ritual are those who displayed a conservative preference in the ritual context compared to non-ritual context. As we expect that marital experience and gender role can provide different level of knowledge on social risk, these moderating effect suggest further specification of our theory. In continuing work, we are planning additional experiments to test this moderation.

General discussion

It has been a longstanding and important puzzle for social scientists that why the same objective conditions are often very differently perceived and evaluated (Salganik, Dodds, and Watts 2006; Zuckerman 2012). In most cases where products made from different production processes are differently valued in the market, it has been generally assumed that perhaps consumers attend to production process as a proxy of quality, whether the quality difference is explicit or implicit. Nonetheless, we still see a few examples where consumers care about production process even when the process do not affect the quality of end-product (Carroll and Swaminathan 2000; Newman and Bloom 2012) and previous theories barely provide a sufficient explanation for this puzzle.

In this study, we make a theoretical contribution by clarifying how such variation may derive from social context, and we provide evidence that is consistent with this theory. At the same time, it is worth clarifying the scope of our argument. While we answer to the question of "why do people care about production process independent of quality," we do not say social context explains it all.

Instead, we simply claim social context is one possible explanation. In brief, our argument is that when people are in the ritual context consumers are conservative with regard to their evaluation of production processes and become reluctant to accept the very same product when it is produced by a new production process.

We tested our argument with the case of diamonds where the new alternative production process has recently become available while traditionally diamonds have always been formed under the earth and produced from underground mines. This case, namely, the contrast of a mined diamond and a lab-created diamond provides an excellent example for our research question, as the advent of a new production process brings uncertainty in the extent to which the ritual rules prescribe. We provide a rigorous test of our argument by using the case where the production process is only *possibly* a part of the ritual rules.

We have found evidence to support our argument that ritual social context make people conservative in accepting a new production process. We theorized that the key driver of "production process conservatism" is ritual context where ritual performers' social role, socioeconomic status or social relationships is publicly demonstrated in the eye of all the audience; therefore, in order to avoid the risk of negative outcome from failing the ritual, ritual performers have to pay extra attention to the rules of rituals. To interpret this finding beyond the scope of the current research, more generally, we believe ritual is a good example of many high-stakes social contexts, along with high level of publicity. In our future stream of research, we expect to directly demonstrate that the fundamental cause of the production process conservatism is the level of publicity and the level of risk associated with it.

Our finding can also talk to the literature of technological innovation. To the question "why technological innovations are not always accepted in the market, even when they provide a clear

benefit?" existing literature have provided various answers. They focused on differences in technological trajectory (Arthur 1994; David 1985; Liebowitz and Margolis 1995), lack of control (Cusumano, Mylonadis, and Rosenbloom 1992; Gawer and Cusumano 2002), or skepticism and inertia of both entrepreneurial organizations (Rao et al. 2003; Strang and Macy 2001; Tripsas 2009; Westphal, Gulati, and Shortell 1997) and of interested audiences (Hannan, Polos, and Carroll 2007; Hsu, Hannan, and Koçak 2009; Hsu and Hannan 2005; Kennedy 2008). Our unique empirical evidence adds a new explanation to this list—even when all the aforementioned accounts are controlled for, social context can promote technological innovations either to acceptance or to rejection. We hope our theory can contribute to this literature by suggesting a new dimension to the widely asked question.

Lastly, it is worth paying attention to the moderating effect of gender and marital experience—essentially, it was ever married females who displayed the strongest production process conservatism. As discussed in Experiment 2, we believe this is related to how much they are exposed to the ritual experience. By going through the ritual, they learn about the products—diamond engagement ring—and realize how socially impactful this ritual is. In other words, we expect that this moderating effect is due to the fact that, by experience, ever-married females have become particularly knowledgeable about where the social risk comes from and/or how impactful the risk is. We leave investigation of this statement for our own future inquiry.

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Appendix

Table 1. Expected price for products made from the alternative production process (without outlier)[14]

Item	N	Mean	Standard Error	[95% Conf.	Interval]
Diamond	205	8690.94	198.201	8300.16	9081.73
Wine	201	78.34	2.275	73.86	82.83
Wagyu beef	171	28.19	0.509	27.19	29.20

Table 2. Expected price for products made from the alternative production process (without outlier) by price category

	Diamond	Wine	Beef	Total
Lower price	131 (63.90%)	156 (77.61%)	85 (49.71%)	372 (64.47%)
Same price	20 (9.76%)	13 (6.47%)	57 (33.33%)	90 (15.60%)
Higher Price	54 (26.34%)	32 (15.92%)	29 (16.96%)	115 (19.93%)
Total	205	201	171	577

Table 3. Attention on production process and the discount of expected price

Production Process is...	Lower	Equal or higher price	Total
...the main reason for the price expectation	173	24	197
...**not** the main reason for the price expectation	72	119	191
Total	245	143	388

$\chi^2(1)=104.68$, $p<0.001$

[14] Since the survey asked the expected price in an open question, there was a great variance in the answers, including some insincere outliers. While in the analysis we have excluded top 10 % and bottom 10% of the values in order to show a more reliable result, inclusion of the outliers does not change the overall interpretation of the data.

Table 4 T-test on expected price by attention on production process (without outliers)

Production Process is...	N	Mean	Std. Err	[95% C.I]	
...the main reason for the price expectation	167	9791.81	128.45	9538.20	10045.42
...**not** the main reason for the price expectation	152	7075.21	168.28	6742.72	7407.71

$t(317)=12.97$, $p<0.001$

Figure 1 example of product description in Pretest 1 and Pretest 2

	Description
Diamond A  Cushion	Shape: Cushion Material: mined diamond Date polished: Nov 2010 Cut: Ideal — Fair / Good / V. Good / **Ideal** / S. Ideal Color: G — H / **G** / F / E / D Clarity: VI1 — SI2 / SI1 / VS2 / **VS1** / VVS2 / VVS1 Carat: 1.03 — 0.5 / **1** / 1.5 / 2.0 / 2.5
Diamond B  Asscher	Shape: Asscher Material: lab-created diamond Date polished: Feb 2011 Cut: Ideal — Fair / Good / V. Good / **Ideal** / S. Ideal Color: G — H / **G** / F / E / D Clarity: VI1 — SI2 / SI1 / VS2 / **VS1** / VVS2 / VVS1 Carat: 1.05 — 0.5 / **1** / 1.5 / 2.0 / 2.5

Figure 2 Choice of recommendation and the effect of social context

All subjects (N=644)

% of choice by social context

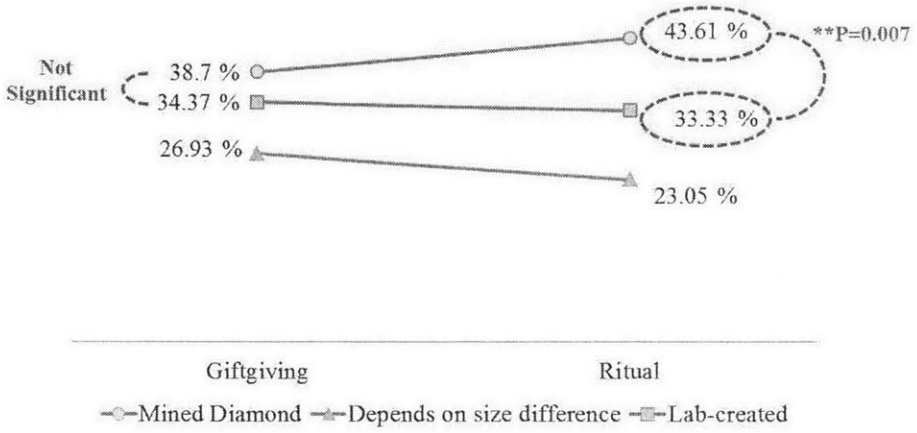

Table 5 Descriptive Statistics

Variable	Mean	Std. Dev.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) Recommendation (DV)	0.411	0.492	1.000													
(2) Price_mined	0.873	0.334	0.263	1.000												
(3) Price_lab	0.020	0.141	-0.098	-0.376	1.000											
(4) Price_same	0.107	0.310	-0.239	-0.907	-0.050	1.000										
(5) Now Married	0.360	0.480	0.102	0.064	0.030	-0.082	1.000									
(6) Widowed	0.003	0.056	0.010	0.021	-0.008	-0.019	-0.042	1.000								
(7) Separated	0.065	0.247	-0.004	0.044	0.007	-0.051	-0.198	-0.015	1.000							
(8) Divorced	0.014	0.117	-0.073	0.006	-0.017	0.002	-0.089	-0.007	-0.031	1.000						
(9) Never Married	0.553	0.498	-0.079	-0.091	-0.026	0.110	-0.834	-0.062	-0.294	-0.132	1.000					
(10) Age_q1	0.261	0.439	-0.037	-0.007	0.015	0.000	-0.328	-0.033	-0.157	-0.041	0.413	1.000				
(11) Age_q2	0.227	0.419	-0.068	-0.016	-0.051	0.040	-0.090	-0.030	-0.098	-0.065	0.159	-0.322	1.000			
(12) Age_q3	0.289	0.454	-0.032	-0.055	0.030	0.045	0.193	-0.036	0.026	0.070	-0.206	-0.379	-0.345	1.000		
(13) Age_q4	0.217	0.413	0.133	0.077	0.005	-0.085	0.240	0.038	0.227	0.034	-0.359	-0.313	-0.285	-0.336	1.000	
(14) Female	0.637	0.481	0.028	0.041	0.086	-0.083	0.089	0.042	0.056	0.007	-0.121	0.008	-0.115	-0.017	0.132	1.000

Table 5 shows means, standard deviations and correlations of variables. Except for the correlation between the reference category and dummy variables (-0.907 between "price_mined" and "price_same", -0.834 between "now married" and "never married"), none of the correlation is significantly high.

Table 6 Logistic Regression Analysis (DV: Recommend Mined Diamond) [15]

		Model 1 All 1	Model 2 All 2	Model 3 female	Model 4 male
Price Expectation	_lab expensive	-2.450**	-2.445**	-2.388**	omitted
		(1.05)	(1.05)	(1.06)	
	_same	-2.351***	-2.348***	-1.943***	-3.186***
		(0.48)	(0.48)	(0.55)	(1.03)
Social Context	ritual	0.225	0.647**	0.767**	0.402
		(0.17)	(0.28)	(0.34)	(0.52)
Marital Status	_widowed	-0.238	-0.473	-0.569	no obs
		(1.45)	(1.46)	(1.46)	
	_divorced	-0.518	-0.227	-0.517	0.633
		(0.36)	(0.47)	(0.57)	(0.96)
	_separated	-2.117*	-1.529	-1.224	omitted
		(1.08)	(1.17)	(1.26)	
	_never married	-0.169	0.169	0.297	-0.0523
		(0.21)	(0.27)	(0.33)	(0.49)
Marital Status x Ritual	ritual x widowed		omitted	omitted	no obs
	ritual x divorced		-0.623	-0.172	-2.171
			(0.72)	(0.84)	(1.55)
	ritual x separated		0	0	0
			0.00	0.00	0.00
	ritual x never married		-0.707*	-0.894**	-0.426
			(0.36)	(0.45)	(0.64)
Age	age_q1	0.123	0.117	-0.183	0.577
		(0.25)	(0.25)	(0.33)	(0.39)
	age_q3	0.173	0.131	0.0686	0.178
		(0.25)	(0.25)	(0.32)	(0.39)
	age_q4	0.738***	0.708**	0.549	0.888*
		(0.27)	(0.28)	(0.34)	(0.50)
Gender	_female	0.0258	0.0413	N/A	N/A
		(0.18)	(0.18)		
Constant		-0.382	-0.569**	-0.473	-0.541
		(0.26)	(0.28)	(0.32)	(0.48)
Log Likelihood		-397.77	-395.09	-254.88	-136.23
Pseudo R-square		0.0841	0.0858	0.0779	0.1146
Observations		641	637	405	229

[15] "Omitted" in the table refers to the cases where there is no variance in the dependent variable for the category and therefore omitted from the analysis. Also, "no obs" indicates that there is no observation for the category.