

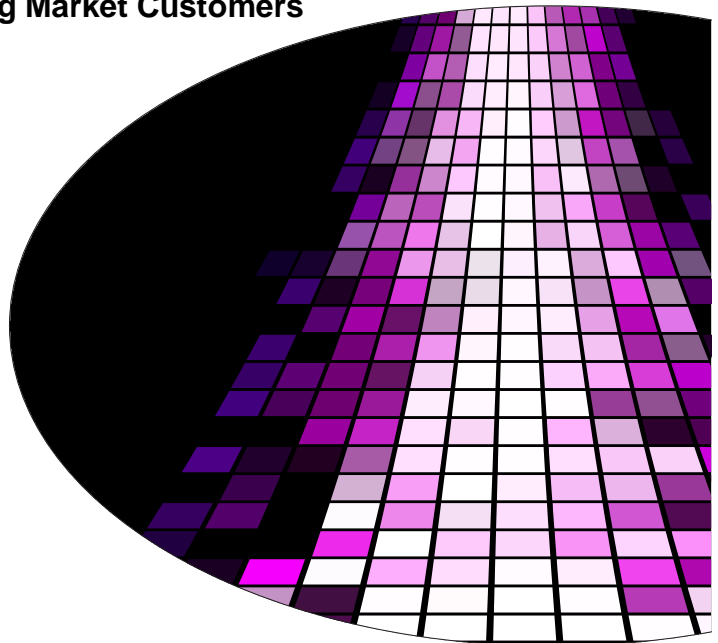
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Resonance between Innovation and Consumers: Suggestions for Emerging Market Customers

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Resonance between Innovation and Consumers: Suggestions for Emerging Market Customers

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Abstract

Consumption increase in emerging markets is significant for global sustainability as it helps in overcoming structural impediments that impede investment inducement. In this light, the paper aims at demonstrating a hypothesis that resonance between innovation and consumers triggers co-emergence of investment essential for an emerging market and further analyses resonant behavior between attractive goods and consumers. The elevation in face temperature of consumers looking at attractive goods was measured at the event corner of a Japanese supermarket by utilizing thermography. Noteworthy findings obtained include that consumer temperatures increase as they perceive, recognize and decide to purchase attractive goods while elevated temperatures decrease when the goods are not attractive enough to purchase. Consumer couples also incorporate a general tendency to converge toward the same decision in a resonant way. Through correlation analysis of sales records, it was demonstrated that sales of attractive goods represents innovation which increases by resonating consumer demand through construction of a spirally developing virtuous cycle. These findings provide a constructive suggestion for stimulating latent consumer vitality in emerging markets as a way of inducing investment.

Keywords: *Resonance, innovation, co-emergence, emerging market, consumers*

INTRODUCTION

Background

In the last two decades, with the stagnation of Japan's economy, many people don't tend to consume as they once did. The new generations in Japan think it's stupid to spend (Matsuda, 2010). In the post-excessive consuming society, it is important to discuss how to encourage the consumers to sustain reasonable consumption. While, emerging markets have been gaining strong expectation for the large consumer population base contributing to global sustainability, these markets demonstrate relational cycles between between consumption and economic growth without inducing substantial investment. Co-emergence between advanced investment and consumption has thus become critical.

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Gibson (1977) postulated that perception of the environment inevitably leads to some course of action. Affordances, or clues in the environment that indicate possibilities for action, are perceived in a direct, immediate way with no sensory processing. This postulate suggests that innovative goods emit tempting signals to consumers while consumers also emit signals anticipating an exciting function as illustrated in Figure 1. Correspondence of consumers' demand and innovative goods triggered by the foregoing resonance leads to the emergence of new value which in turn enhances demand and innovation, and leverages spirally developing virtuous cycle as illustrated in Figure 2.

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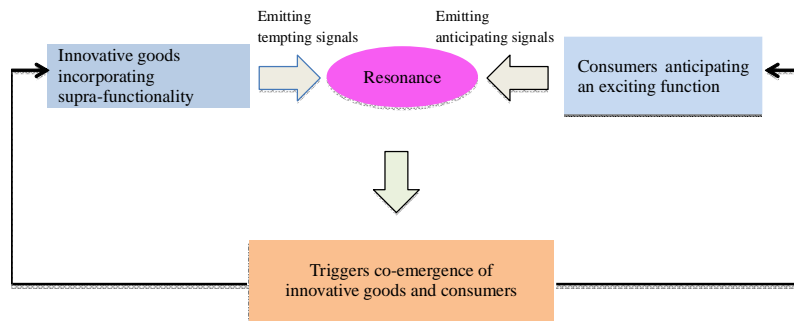


Figure1: Resonance of Signals Emitted by Innovative Goods and Consumers.

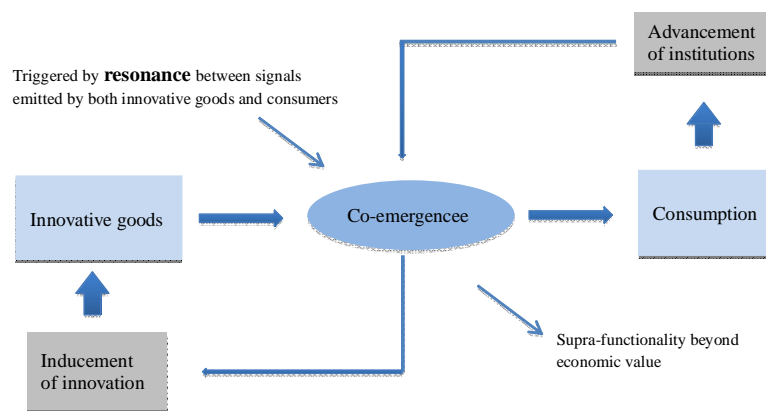


Figure 2: Dynamism of Co-emergence of Innovative Goods and Consumption leading to Supra-functionality beyond Economic Value.

Aiming at analyzing the resonance between innovative goods and consumers, a pilot experiment was conducted at Japan's leading supermarket. Consumers pursue attractive goods by learning utmost gratification of consumption ever experienced and emit signals thereon (Modigliani, 1965; Watanabe, 2010) both in developed markets and emerging markets. Therefore, the experiment conducted in Japan, to demonstrate the resonance between innovation and consumption, can provide significant implications for the marketing strategy in emerging markets.

Research purpose

With the measurement of the relationship between attractive goods and consumers' face temperature elevations, at the event corner of a Japanese leading supermarket, this paper demonstrates the hypothesis that there exists a resonance between attractive goods and consumers leading to co-emergence between innovation and consumption. This contributes in overcoming structural impediments towards sustainable growth not only in emerging markets but also in advanced countries.

EXISTING WORKS

Thermography

Few attempts have been made in measuring the physiological activities or resonant behavior of shoppers facing attractive goods, tempting their consumption without the stimulus from price reduction (Douglas et al., 2004). However, no one has ever experimented without providing any cautious mind or tension to examinees. Traditional methods on the study of shoppers' behaviors like questionnaire survey, provide significant attention to the psychology of shoppers and urge them their involvement. In the cognitive psychology, while it has been popular to use an experiment by tracing eye movements, it puts strong pressure on the examiners and is hardly sufficient to observe shoppers' reaction without any presupposition (Darryl and John, 2011, Robert, 2011). Dramatic advancement of thermography in many areas in recent years, especially for many temperature measurement applications, provides anticipation to solving this problem (Snell and Renowden, 2000). With thermography measurement of the temperature changes on the face, the physiological and psychological activities can be confirmed and evaluated. In line with the emotion of stress or relaxation, the temperature regulation function of the autonomic nervous system will change. This can be attributed to the change in the blood stream of the skin, which leads to the assumption of the physiological and

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psychological activities. In terms of consuming actions, it is true that many factors impact consumers' behaviors. These factors include brand, pricing, attractive promotional discounts, colors, placement on the shelf and so on. By face thermography, it makes the relationship between psychological activities and consuming actions more visible. At the same time, the most important merit of face thermography is that the experiment can be easily conducted, since the experiment's participants (consumers) do not need to do anything. Thus, a kind of untouched experiment between the measurement tool and examinees (consumers) can be enabled by the thermography.

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Motivation, emotion and psychology

Motivation is a condition that energizes behavior and gives it direction. It is experienced subjectively as a conscious desire (Hilgard et al., 1999). A model of basic motives would be as follows; An external stimulus, such as the sight of food, is compared to the memory of its past reward value. At the same time, physiological signals of hunger and satiety modulate the potential value at the moment. These two types of information are integrated to produce the final incentive motivation for the external stimulus, which is manifested in behavior and conscious experience (Toates, 1986).

Emotions and motives are closely related. One distinction is that emotions are triggered from the outside, whereas motives are activated from the inside. Another distinction is that a motive is usually elicited by a specific need, whereas an emotion can be elicited by a wide variety of stimuli (Hilgard et al., 1999). Emotion is a complex condition that arises in response to certain, affectively toned experience. An intense emotion has at least six components (Frijda, 1986; Lazarus, 1991) which are as follows: (i) the subjective experience of the emotion, (ii) internal bodily responses, particularly those involving the autonomic nervous system, (iii) cognitions about the emotion and associated situations, (iv) facial expression, (v) reactions to the emotion, and (vi) action tendencies. Facial feedback hypothesis is one of the major theories of emotion. In addition to their communicative functions, emotional expressions also contribute to our experience of emotions, which is called the facial feedback hypothesis (Tompkins, 1962). Studies also showed that emotional expressions led to changes in heartbeat and skin temperature (Levenson et al., 1990).

In our experiment, utilizing the thermography, the physiological activities related to emotion and its components, as mentioned above, were traced in correspondence to the following changes: sight of attractive goods, cerebral

stimuli, the autonomic nervous system stimuli, blood flow and facial temperature increase.

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In-store marketing and consumer behavior

The place from where customers make purchasing decisions, whether on impulse inside stores, or as planned is usually discussed by researchers. In case of inside stores, in-store marketing is considered to be an effective way to promote consuming. In-store marketing is usually defined as sale promotion at a retailer's location, with bundled offers, expert advice, product demonstrations, product samples, special discounts, etc. Here, purchasing promotion by a third party is emphasized. Without promotion from a third party, it is certain that purchasing actions can also be confirmed with the attractiveness of the innovative commodities and goods displays. This is because based on customers' learning experiences from preceding consumption (Modigliami, 1965) and emit signals indicating a desire for further consumption (Gibson, 1977, 1979). Consumers pursue attractive goods by learning utmost gratification of consumption ever experienced and emit signals thereon (Modigliami, 1965; Watanabe, 2010). In this paper, consumer behaviors and purchasing decisions are observed by facial temperature's elevation as physiological responses to external stimulus.

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Emerging markets

With the focus on emerging economies, many researches on the emerging markets and consumers have been conducted (Khanna and Rivkin, 2001, Khanna et al, 2005, Bekaert and Harvey, 2002 and London and Hart, 2004). The bottom of the world economic pyramid including 4 billion people in emerging markets, represents a big new opportunity for businesses. Consumers in emerging markets buy a lot of the cheapest and a little of the best and often ignore the middle (D'Andrea et al., 2010), which implies that producers of goods have to make the product more innovative. It is also pointed out that a store must be more than a source of necessities; it must also be a center of knowledge and learning (D'Andrea et al., 2010).

EXPERIMENT

Methodology

With the cooperation of a Japanese leading supermarket, in the suburbs of Tokyo, by utilizing the thermography (Picture 1), following monitoring survey was conducted at the event corner of daily goods in the basement of the supermarket:

- (i) Beautifully decorated popular brand melon-bread with reasonable price, attractive enough to tempt shoppers' appetite, were smartly

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- arranged at the event corner,
- (ii) An infrared camera (FLIR SC65) was fixed in the upper showcase of goods (invisible to consumers) with certain distance that can focus on consumers' faces,
 - (iii) The distribution of consumers' temperatures among the scope of images taken by the thermography, image data and numerical time series data were recorded.
 - (iv) The measurement data were recorded in a personal computer, which was connected to the thermography by cable (transmission of temperature measurement data, image analyses),
 - (v) In the analyses of the recorded data, the exclusive camera-software "FLIR Research IR", (which can identify a pin-point temperature) was utilized,
 - (vi) In addition to the above temperature measurement data, the POS (Point of Sale) data of goods displayed at the event corner were recorded,
 - (vii) Experiment schedule:

Day 1 (16th, February ~ 15:00~20:00) Trial test
Day 2 (17th, February ~ 14:55~20:00) Trial test
(modification of thermography's direction and the data recording method)
Day 3 (18th, February ~ 17:00~21:30)
Day 4 (19th, February ~ 15:00~18:20)
Day 5 (20th, February ~ 15:00~20:00)
Day 6 (21st, February ~ 14:35~20:00).



[FLIR SC655 product information]
Image size: 640×480 pixels
Image frequency: 50Hz
Temperature range: -20~650
PC connection: by Ethernet image streaming as 16-bit 640×480 pixels
Viewing: 25°×18.8°/0.4m
Auto focus:
temperature sensibility < 0.05

Picture 1: Thermography camera for the experiment.

Pictorial views of the experiment

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Pictorial views of the experiment are illustrated as follows:

- 1) Display of commodities at the event corner (photo taken 27 January 2011)



Picture 2: Display of commodities of the event corner.

- 2) Hanging thermography (photo taken 15 Feb.)



Picture 3: Hanging thermography.

- 3) Installation of PC for data recording (photo taken 15 Feb.)



Picture 4: Installation of PC for data recording.

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4) Angle of the thermography and target of monitoring (photo taken 21Feb.)



Picture 5: Angle of the thermography and target of shoppers.

5) Analysis of the recorded data (24 and 25 Feb.)



Picture 6: Analysis of the recorded data.

RESULTS OF THE EXPERIMENT

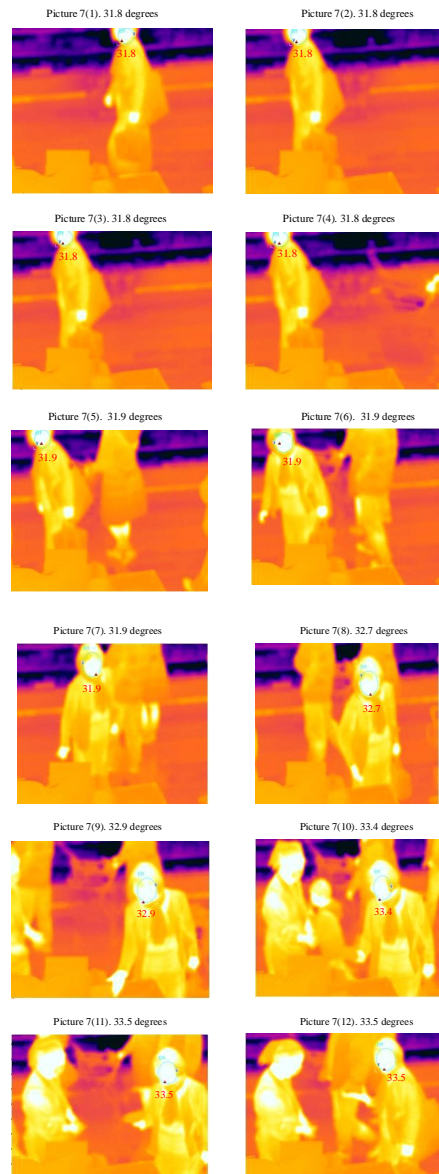
Change in temperature depending on buy or not-buy?

Aiming at examining the change in face temperature of consumers looking at attractive goods, trends in temperatures of consumers who purchased (Buys) and the ones who did not purchase (Not Buys), were traced. In order to avoid the influences of external environments, maximum temperatures were traced.

Standardized Pattern of Buys

First, taking two cases of Buys, standardized pattern of decision making process to buy was analyzed by tracing their face temperatures.

(1) Case 1



Results are illustrated in Figure 3 which demonstrate that temperatures of Buys elevated as they recognized the attractiveness of the goods and decided to purchase the attractive goods.

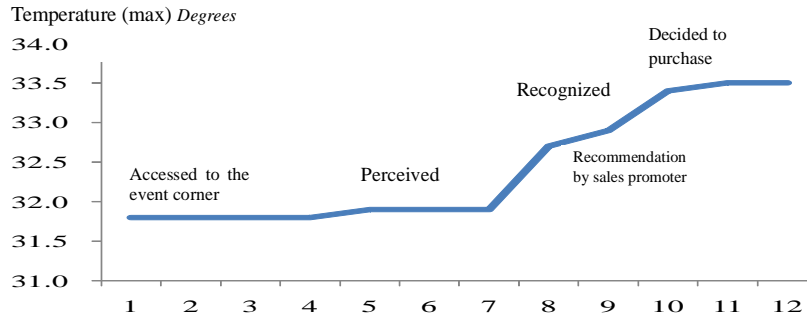
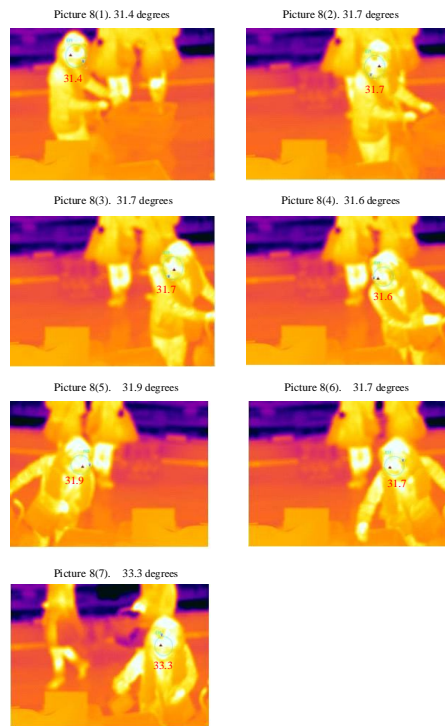


Figure 3: Standardized Pattern of Temperature Change in Buys (1).
(2) Case 2



While the results of the trace show slight up and down before final decision as illustrated in Figure 4, similar to Case 1, demonstrate temperature elevation trend as perceived, recognized and decided to purchase.

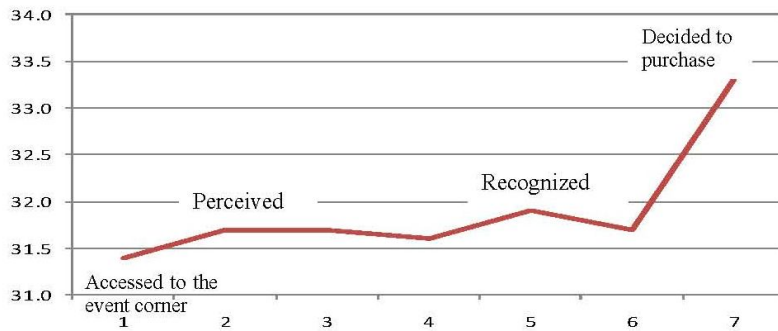


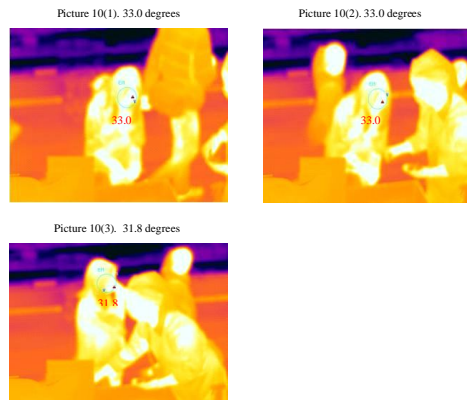
Figure 4: Standardized Pattern of Temperature Change in Buys (2).

Standardized Pattern of Not-buys

Second, taking two cases of Not-buys, standardized pattern of decision making process resulting in giving up the purchase, were analyzed by tracing their face temperatures.

(1) Case 1





Results are illustrated in Fig. 5 which indicate that, contrary to Buys, Not-buys demonstrate descending trends in their temperatures.

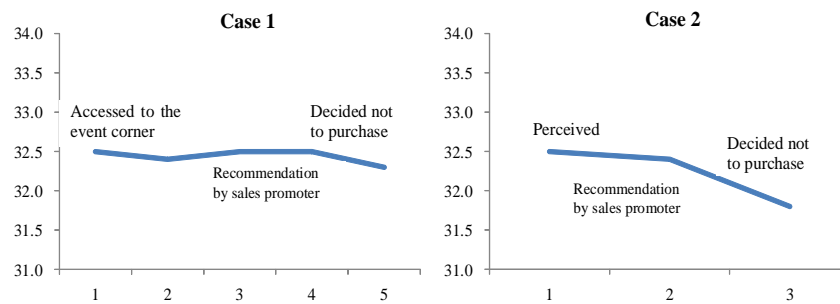
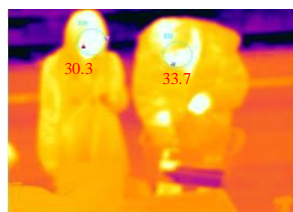


Figure 5 : Standardized Pattern of Temperature Change in Not-buys.

Resonance between partners by consumer couples

Observing shoppers behavior focusing on consumer couples, it has been demonstrated that, as a consequence of mutual inspiration, resonating elevation of temperatures between them were proceeded.

Picture 11(1). F (Female) 30.3 degrees M (Male) 33.7 degrees



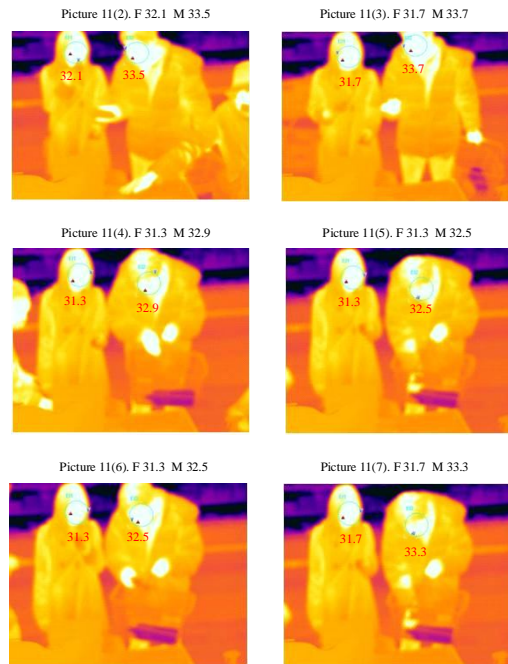


Fig. 6 demonstrates the resonating pattern of consumer couples, leading to a decision to purchase by re-recognizing the attractiveness of (goods as a consequence of mutual inspiration).

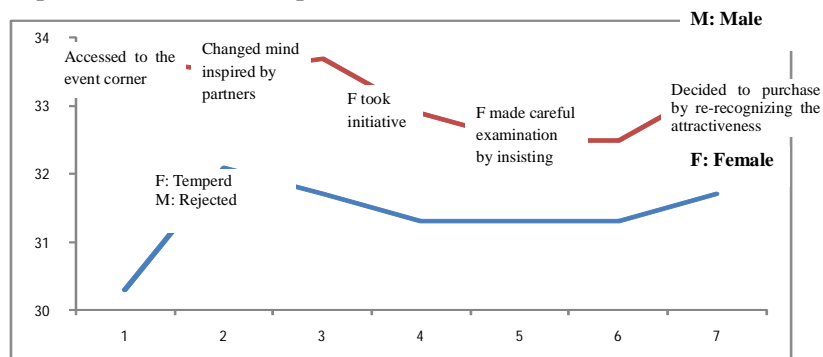


Figure 6: Resonating Pattern of Coupled Customers.

CORRELATION BETWEEN ATTRACTIVENESS AND TEMPERATURE INCREASE

Foregoing analyses demonstrated that attractive goods, which encourage

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consumers to decide to purchase, elevate consumers' face temperature. Aiming at cross-evaluating this phenomenon in a macroscopic dimension, with a simple postulate based on the general fact that attractive goods increase sales: attractive goods elevate temperature which corresponds to sales increase, correlation between changes in temperature and sales was analyzed.

TEMPERATURE ELEVATION INDEX (TEI)

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First, utilizing monitored data following temperature elevation index (TEI), X was constructed:

$$X = \int_{t_s}^{t_e} f(t) dt \tag{1}$$

$$f(t) = \begin{cases} 0 & (T(t) - a < 0) \\ T(t) - a & (T(t) - a \geq 0) \end{cases} \tag{1}$$

where T(t): Maximum temperature, a: threshold value, ts: starting time, te: termination time.

Under the experimental environment, since there were no goods with higher temperature than that of shoppers, given that the temperature monitored demonstrated the highest level, certain threshold value was introduced in the analysis. In case when consumer's temperature (maximum temperature) does not exceed this threshold, it demonstrates that no temperature elevation has emerged. Contrary to this phenomenon, in case when consumer's temperature exceeds this threshold, it demonstrates that consumer's temperature has elevated in response to the resonance with attractive goods.

By counting values exceeding the threshold, temperature elevation index (TEI) can be measured as illustrated in Fig. 7.

Based on the preceding analysis in sub-section 4.1, threshold level can be considered 33 degrees, TEI value X was computed as tabulated in Table 1.

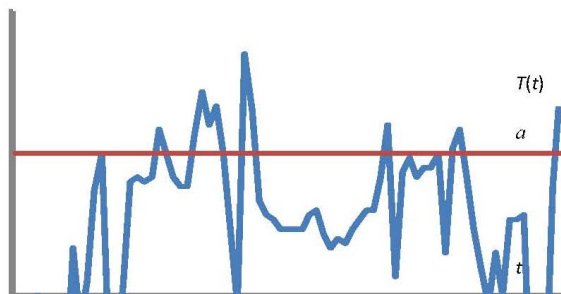


Fig. 7. Scheme of Elevation of Body Temperature.

Table 1: Trend in Measured Value of TEI: X

Time	X
2/19 14:55:00 -15:54:59	480
2/19 15:55:00 -16:54:59	576
2/19 16:55:00 -17:54:59	348
2/20 14:55:00 -15:54:59	361
2/20 15:55:00 -16:54:59	328
2/20 16:55:00 -17:54:59	262
2/20 17:55:00 -18:54:59	170

ATTRACTIVENESS OF THE GOODS AND THEIR SALES VOLUME

Second, by analyzing trends in sales volumes of goods at the event corner from POS data, it was demonstrated that sales volume reflected the attractiveness of goods.

Fig. 8 illustrates trends in sales volume of melon-bread at the event corner by dividing the stock into two lots; first lot with normal price and second lot with the discounted prices. Fig. 8 clearly demonstrates conspicuous increase in sales volume for discounted ones. Since attractiveness of the goods, of the same quality can only be increased by cheaper prices, Fig. 8 demonstrates that increase in attractiveness in goods explicitly contributes to increase in sales volume.

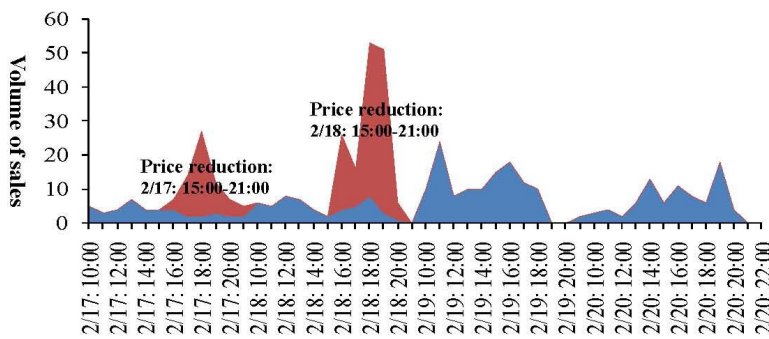


Figure 8: Trend in Sales Volume of Melon-bread (Feb. 17 - 20).

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SALES VOLUME CORRESPONDING TO ELEVATION OF TEMPERATURE

From POS data, Table 2 tabulates sales volume (S) of melon-bread at the event corner corresponding to Table 1. Since it takes 5 minutes to take the melon-bread from the event corner to the cashier, 5 minutes time lag was imposed in Table 2.

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Table 2: Trend in Sales Volume

Time	S
2/19 15:00 -16:00	15
2/19 16:00 -17:00	18
2/19 17:00 -18:00	12
2/20 15:00 -16:00	6
2/20 16:00 -17:00	11
2/20 17:00 -18:00	8
2/20 18:00 -19:00	6

CORRELATION

Fig. 9 illustrates correlation between temperature elevation index (TEI) X and sales volume S, that demonstrates strong positive correlation between them Correlation coefficient value was 0.877.

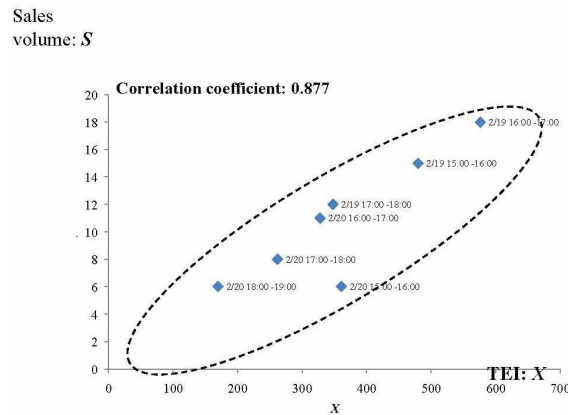


Figure 9: Correlation between Elevation of Temperature and Sales Volume. Result of the regression analysis between them suggests that, while degree of freedom is not necessarily sufficient, due to the constraints of the eligible

samples in this pilot experiment, strong correlation between attractiveness of goods and elevation of consumer's temperature.

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$$S = 0.0298X + 0.114 \quad adj.R^2 \ 0.769 \quad DW \ 2.74$$

(4.08)** (0.04)

** significant at the 1% level.

These analyses provide supporting evidence to the findings that attractive goods elevate consumer's face temperature from macroscopic dimension.

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RELATIONSHIP BETWEEN BUYS/NOT-BUYS AND THEIR TEMPERATURES

Criteria for the analysis

Aiming at further providing microscopic examination of the findings obtained by the foregoing analyses (that "attractive goods induce the elevation of consumer's temperature,") comparative analysis of temperatures between Buys (consumers who purchased goods) and Not-buys (those not purchased) was conducted taking 50 eligible samples, both in Buys and Not-buys on February 19 (Sat) and 20 (Sun), respectively (whole eligible samples amount to 200). This was done when experiment had been well experienced and sales of goods at the event corner were at full-fledged stage. Eligible samples were chosen from the portrait data with the following criteria:

- (a) Consumers with clear face portrait who perceived the goods and paid attention to them,
- (b) Consumers without clear face portrait and/or wearing "noise to the temperature" as cap were excluded,
- (c) Consumers who took goods and put them into the shopping basket were identified as Buys,
- (d) Temperature of the consumer's face was measured Maximum temperature of the face was identified by encircling the face from the portrait data.

RESULTS OF THE ANALYSIS

February 19 (Sat) Melon-bread (Induced by sales promoter)

Average temperature (maximum temperature)

Buys: 32.4 degrees

Not-buys: 31.5 degrees

Buys demonstrate 3% higher temperature than *not-Buys*.

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February 20 (Sun) Melon-bread (Without inducement by sales promoter)

Average temperature (maximum temperature)

Buys: 33.1 degrees

Not-buys: 31.5 degrees

Buys demonstrate 5% higher temperature than *Not-buys*.

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These results indicate that *Buys* demonstrate higher temperature than *Not-buys* and support the preceding findings that attractive goods induce elevation of consumer's temperature.

Temperatures of *Buys* on 20 Feb (Sun) without inducement of sales promoter (33.1 degrees) were higher than those on 19 Feb (Sat) with such inducement (32.4 degrees). This suggests that consumers who decided to purchase by their own will without inducement of others realize the attractiveness of the goods deeper than consumers who decided to purchase by the recommendation of others. The former set of consumers and resonate with the goods more stronger than induced consumers.

Comparison by gender

When the foregoing results were compared by gender, it was observed that male consumers' temperature were higher as a consequence of the differences of basal metabolism between male and female. If we compare their temperatures by adjusting this physical difference indigenous to gender, female temperature are seen to be generally higher than male, as demonstrated in Table 3. This suggests that female consumers resonate with attractive goods much stronger than male customers.

Table 3: Comparison of Temperature between Buys and No-buys by Gender

	Feb. 19 (Sat)			Feb. 20 (Sun)		
	Female	Male	Total	Female	Male	Total
<i>Buys</i>	32.7	32.3 (31.0) ^a	32.4	33.0	33.1 (31.8) ^a	33.1
<i>Not-Buys</i>	31.4	32.0 (30.7) ^a	31.5	31.4	31.8 (30.5) ^a	31.5

^a Figures in parentheses indicate values adjusted by the following equation taking the physical differences in basal metabolism between male and female.

Adjusted value = *Temperature* x(1-0.0415 : 0.0415 adjustment coefficient (Ministry of Health and Welfare)

If we compare the ratio of temperature between female and male by *Buys* and *Not-buys*, it has been demonstrated that the ratio in *Buys* is higher

than the ratio in Not-buys as compared in Table 4. This supports the foregoing findings that female consumers resonate with attractive goods much stronger than male consumers.

Table 4: Ratio of Temperature between Female and Male by Buys and Not-buys

	Feb. 19 (Sat)	Feb. 20 (Sun)
<i>Buys</i>	32.7/31.0 = 1.06	33.0/31.8 = 1.04
<i>Not-Buys</i>	31.4/30.7 = 1.02	31.4/30.5 = 1.03

See Appendix 1 and Appendix 2

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IMPLICATIONS FOR EMERGING MARKETS

Structural impediments towards activation of latent consumer vitality

Contrary to strong expectation of the leading role that emerging economies may take for reactivating global economy and contributing to its sustainable growth, no substantial initiative has been observed so far. Against strong expectation of potential vitality of large consumer population in emerging markets, it still remains latent consumer vitality. This can largely be attributed to a related cycle between consumption and economic growth without inducing substantial investment in emerging markets. Consequently, notwithstanding their increase in consumption, their economic growth has remained far behind the anticipated level. Without overcoming such structural impediments common to emerging markets, global co-evolution between activation of stagnated economy in advanced countries and activation of latent vitality in emerging countries, cannot be expected.

Decisive role of resonance between attractive goods and consumers

In order to overcome such structural impediments in emerging markets, emergence of resonance between attractive goods and consumers plays a decisive role. The foregoing experiment demonstrates a significant role of the resonance between attractive goods and consumers demand, which prompts us towards a strong possibility in triggering co-emergence of investment and consumption. This would lead to producing attractive goods, which in turn would induce higher consumer demand, and stimulate latent consumer vitality in emerging markets.

Behaviors of shoppers both Buys and Not-buys traced by face temperatures measured by thermography, provide constructive suggestions in developing the foregoing resonance by means of the design of the market, selection of attractive goods, their display, arrangement of sales promoters, and propaganda. Instilling demanding nature of shoppers is particularly important.

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Center for resonance emergence

Noteworthy observations obtained by the foregoing experiment suggest that consumers deciding to purchase by their own will, without depending on sales promoters' advice, demonstrate higher resonance and also consumer couples converge toward the same purchasing decision in a resonant way. These observations suggest a significant function of the shopping centers in emerging markets. They, not only satisfy consumers' principle consumption need, but also act as a center of knowledge and learning thereby inspiring higher resonance possibilities between innovative goods and more demanding consumers. This also contributes to instilling demanding the nature of shoppers in emerging markets.

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CONCLUSION

Noteworthy findings

Behavior in decision making for purchase and temperature

- (a) Consumers' temperatures elevate as they perceive, recognize and decide to purchase the attractive goods,
- (b) Elevated temperature may decrease if the goods are not attractive enough to purchase,
- (c) Consumer couples incorporate general tendency to converge into the same decision in a resonant way,
- (d) Recommendation by sales promoter functions to temporary elevation of the consumers temperature.

Attractiveness of goods and temperature increase

- (a) Consumers' temperatures exceeding the threshold reflect the elevation of temperature in response to attractive goods,
- (b) The level of the threshold in this experiment environment (16-21 February 2011, at the event corner of the basement of the supermarket displaying melon-bread) can be identified as 33 degrees,
- (c) Increase in sales volume reflects the degree of the attractiveness of the goods,
- (d) There exists a positive significant correlation coefficient between sales volume increase (as a consequence of the attractiveness of the goods) and the elevation of the consumers' temperatures.

Relationship between buys/not-buys and temperature

- (a) Consumers who decided to purchase demonstrate higher temperature than those who do not decide to purchase,
- (b) Consumers who decided to purchase the goods by their own will without

depending on the recommendation by the sales promoter incorporate ability to recognize the attractiveness of the goods deeply leading to higher elevation of their temperatures, than those depending on the recommendation of the sales promoter,

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- (c) While male consumers generally demonstrate higher temperature than female consumers, this order reverses by adjusting the difference of basal metabolism between male and female suggesting that female consumers are more sensitive to the attractiveness of the goods,
- (d) The ratio of temperatures between female and male in Buys demonstrates higher value than that in Not-buys.

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Possibility and limit of the thermography

- (a) Thermography enables observation in the objective circumstances without providing any cautions to examinees,
- (b) It incorporates variety of possibilities in analyzing shoppers' behaviors,
- (c) It provides effective analytical tool in analyzing the decision making process of shoppers,
- (d) It is also effective in analyzing the identification of the attractiveness of the goods and also of the effects of sales promotion,
- (e) However, further careful attention should be paid to the biases leading to variation natural temperature, that could be caused by examinees costume (e.g., cap/masks) and also by external conditions as weather and examinees physical conditions.

SUGGESTIONS TO OVERCOME CONSUMPTION-HATERS

Some of the suggestions are:

- (i) Sales promotion strategy inducing shoppers' purchasing decision can be developed based on the relationship between decision-making behavior for purchase and change in temperature,
- (ii) Producers/ retailers can utilize the finding that identification of the attractive goods corresponds in to consumers latent expectation (based on the correlation between attractiveness of the goods and elevation of the temperature)
- (iii) Improvement of the sales promotion strategy and goods avoidance strategy can be attempted, based on the relationship between Buys/ Not-buys and their temperatures.

IMPLICATIONS FOR EMERGING MARKETS

Following are the key implications:

- (i) Overcoming structural impediments common to emerging markets that

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- hamper inducement of substantial investment through consumption is critical,
- (ii) Resonance between attractive goods and demanding consumers is expected to trigger co-emergence of investment and consumption leading to spirally developing attractive goods and more demand of consumers,
- (iii) Shopping centers should not only satisfy consumers' principle consumption need but must also act as a center for knowledge and learning thereby inspiring higher resonance possibilities.

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FUTURE WORK

The future work would focus on the following:

- (i) Further exploration of the possible applicability of the advanced thermography,
- (ii) Further breakthrough of the limit of the thermography,
- (iii) Elimination of the biases for the sufficient utilization of the thermography
 - (a) Costume of the examinees (e.g., cap, mask),
 - (b) Behavior and shape of the examinees (e.g., height, shopping area),
 - (c) Elimination of the disturbance by the external conditions (e.g., weather, physical condition of examinees), and
 - (d) Construction of sound and stable experimental environment (e.g., angle of the thermography, connection with PC).
- (iv) Development of the experimental sectors (e.g., apparel, home electric appliances, mobile phone), and
- (v) Comparative analysis with different institutional systems, particularly with emerging markets.

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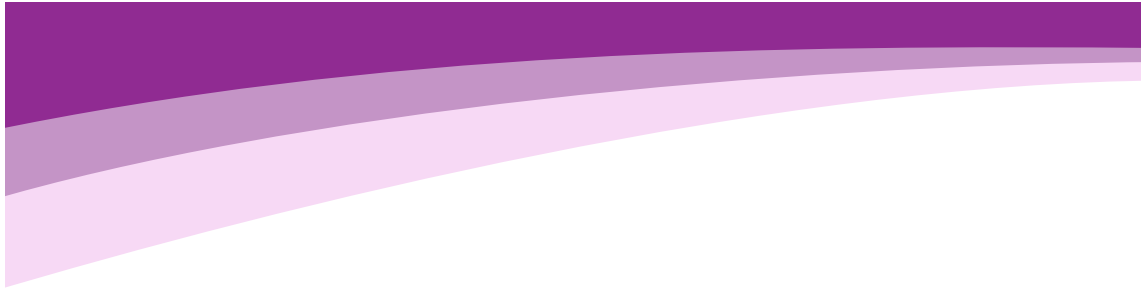
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Appendix 1: Monitored data on February 19 (Sat) M: Male, F: Female

	Samples	1	2	3	4	5	6	7	8	9	10
Buys	Gender	F	F	M	M	M	F	F	F	F	M
	Temperature	31.1	33.2	32	33.7	32.5	31.2	30.4	32.8	31.7	33.1
	Time	15:02:37	15:03:26	15:05:41	15:11:59	15:14:24	15:18:54	15:19:07	15:19:20	15:23:35	15:25:47
<i>Not-buys</i>	Gender	F	F	F	F	F	F	M	F	F	F
	Temperature	31.3	31.3	32.5	31.7	29.9	30.9	32.2	31	32.3	31.3
	Time	15:00:12	15:00:50	15:02:01	15:02:02	15:03:24	15:03:40	15:04:31	15:07:17	15:08:47	15:09:34
	Samples	11	12	13	14	15	16	17	18	19	20
Buys	Gender	F	F	F	F	F	F	F	F	M	M
	Temperature	33.2	30.4	33.5	34.7	33.6	33.3	31.7	32.6	33.5	30
	Time	15:25:49	15:29:10	15:34:26	15:35:24	15:38:36	15:41:56	15:41:56	15:43:39	15:43:39	15:48:36
<i>Not-buys</i>	Gender	F	F	F	F	F	M	M	F	F	F
	Temperature	32.6	31.7	29.7	28.7	28.6	31.3	32.7	32.6	33.2	31.9
	Time	15:10:00	15:10:21	15:10:56	15:11:02	15:11:11	15:11:14	15:11:14	15:11:56	15:12:30	15:12:30
	Samples	21	22	23	24	25	26	27	28	29	30
Buys	Gender	F	F	F	F	F	F	F	F	F	F
	Temperature	32.8	34.3	33.2	33.5	34.3	32.6	32.4	30.8	33.4	33.3
	Time	15:49:40	15:53:17	15:58:47	16:04:07	16:04:07	16:23:11	16:23:36	16:29:23	16:35:21	16:40:34
<i>Not-buys</i>	Gender	M	F	M	F	F	F	F	M	F	M
	Temperature	33.4	30.4	32.1	32.3	30.8	30.7	32.3	31.7	31.9	32.6
	Time	15:12:38	15:12:52	15:12:53	15:14:02	15:14:59	15:15:00	15:15:10	15:15:10	15:15:45	15:16:13
	Samples	31	32	33	34	35	36	37	38	39	40
Buys	Gender	F	F	F	F	F	M	F	F	F	M
	Temperature	30.9	32	33.8	34.2	34	32.2	33.6	31.8	33.5	32.8
	Time	16:42:35	16:42:54	16:46:48	16:46:48	16:50:41	16:56:13	16:58:59	17:07:27	17:34:45	17:41:32
<i>Not-buys</i>	Gender	F	F	M	M	M	F	F	F	F	F
	Temperature	31.4	32.3	31.4	31.3	30.5	31.3	32.2	33.6	32.8	30.5
	Time	15:17:34	15:17:46	15:18:21	15:19:31	15:20:21	15:20:07	15:22:30	15:23:05	15:23:22	15:24:09
	Samples	41	42	43	44	45	46	47	48	49	50
Buys	Gender	F	M	M	M	F					
	Temperature	30.2	31.2	31.7	32.4	33.2					
	Time	17:44:55	18:09:57	18:10:05	18:16:54	18:36:34					
<i>Not-buys</i>	Gender	M	F	F	F	F	M	F	F	F	M
	Temperature	32.2	30.1	32.6	31	31.2	31.9	32.8	31	29.8	32.2

Appendix 2: Monitored data on February 20 (Sun)

	Time	15:24:22	15:24:25	15:24:49	15:26:45	15:27:00	15:28:05	15:28:28	15:28:38	15:28:55	15:29:01
	Samples	1	2	3	4	5	6	7	8	9	10
Buys	Gender	M	F	F	F	M	M	F	F	F	F
	Temperature	32.2	34.3	33.2	33	33.7	34	33.7	33.9	33.8	32.1
	Time	15:05:53	15:08:37	15:11:37	15:11:48	15:16:32	15:22:18	15:30:07	15:30:50	15:48:01	16:00:35
Not-buys	Gender	F	F	F	F	F	M	F	F	F	F
	Temperature	32.1	32.5	32.3	30.9	33.9	31.8	31.9	28.5	32.0	31.7
	Time	15:00:44	15:00:53	15:02:50	15:02:59	15:05:23	15:06:17	15:11:07	15:13:01	15:13:15	15:14:16
	Samples	11	12	13	14	15	16	17	18	19	20
Buys	Gender	F	F	M	F	F	F	F	M	F	F
	Temperature	33	32.8	33.7	33.3	33.6	33.6	32.7	34.4	32.4	32.7
	Time	16:04:47	16:06:36	16:06:52	16:20:34	16:28:23	16:35:50	16:39:51	16:34:57	16:51:15	16:54:22
Not-buys	Gender	F	F	F	F	M	M	F	F	F	F
	Temperature	29.2	30.3	28.4	31.8	31.4	32.1	31.1	32.1	31.7	31.5
	Time	15:14:47	15:15:13	15:16:06	15:16:11	15:16:21	15:17:40	15:17:41	15:17:47	15:19:40	15:19:58
	Samples	21	22	23	24	25	26	27	28	29	30
Buys	Gender	F	F	M	F	M	M	F	F	F	F
	Temperature	33.5	33.3	34.4	32.8	31.4	33.9	31.9	32.6	32.6	33.8
	Time	17:02:06	17:29:12	17:57:43	17:58:46	17:58:57	18:07:32	18:09:13	18:09:46	18:09:48	18:14:38
Not-buys	Gender	F	F	F	F	F	F	F	M	F	M
	Temperature	32.9	32.7	30.6	30.9	30.5	30.0	31.9	31.9	31.3	31.4
	Time	15:20:41	15:20:53	15:22:21	15:22:36	15:22:56	15:23:03	15:24:30	15:25:17	15:26:21	15:26:32
	Samples	31	32	33	34	35	36	37	38	39	40
Buys	Gender	F	F	F	F	M	F	M	M	M	F
	Temperature	32.1	33.6	34.4	32.7	31.4	32.3	33.2	32.8	33.2	34.0
	Time	18:27:38	18:40:46	18:45:25	19:02:21	19:06:41	19:15:52	19:26:04	19:27:21	19:34:24	20:03:25
Not-buys	Gender	F	F	F	F	M	M	F	F	F	F
	Temperature	31.5	31.9	30.1	31.9	31.6	31.7	31.6	31.8	32.0	31.8
	Time	15:29:01	15:29:54	15:30:27	15:34:11	15:34:55	15:35:31	15:36:20	15:36:54	15:37:00	15:38:06
	Samples	41	42	43	44	45	46	47	48	49	50
Buys	Gender	F	M	F							
	Temperature	32.7	33.1	33.2							
	Time	20:08:24	20:08:34	20:10:17							
Not-buys	Gender	F	F	F	M	F	F	M	F	F	F
	Temperature	31.4	31.4	32.1	32.3	31	31.8	31.9	31.5	31.7	31.3
	Time	15:38:37	15:38:44	15:39:22	15:39:22	15:41:00	15:42	15:44:03	15:44:56	15:45:03	15:45:39



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