Food Safety Risk Communication: The Message and Motivational Strategies

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PART II

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Using normative information to encourage food processing workers to keep food clean

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Abstract
Research in a number of psychological domains has found that when individuals are given information about normative behaviour, they are likely to act in accordance with these norms. We used this notion to examine whether presenting normative information to workers at a turkey processing plant could motivate them to keep the products clean and uncontaminated. In a 2 X 2 between-subjects design, production employees were provided with information about descriptive norms (how many employees engaged in specific behaviours) and/or injunctive norms (what employees say they believe are appropriate food safety behaviours). After receiving one of these four combinations of normative information, intentions of producing clean and uncontaminated products were assessed among 162 (62%) of the plant's production workers. Contrary to theoretical predictions, there were no main effects for the norm conditions. However, results indicate that providing information about injunctive norms increased intentions to act in ways to avoid contamination for women, while the reverse pattern was true for men. The implications of these results for motivating the behaviour of people who are concerned with food safety from the farm to the fork are considered.

Keywords: descriptive and injunctive norms, intentions, food safety

Introduction
In 2000, the World Health Organization (WHO) recognized food safety as an essential public health function and called for more research on food safety in combating this major health problem (Schlundt, 2002). Food safety is a challenge that must be researched from multiple perspectives and levels of analyses. Keeping food safe and avoiding contamination results from a number of factors beginning with preventive work at the farm, at food processing sites, and ending with the behaviour of the consumer. This “farm to fork” approach to food safety is seen as the most effective way to prevent foodborne illnesses. Our research has focused on how social psychological approaches at the processing stage can motivate employees to keep food safe and avoid contamination.

As seen in Figure 1, the theory of planned behaviour (TPB; Ajzen, 1991) predicts that behavioural intention and perceived behavioural control ultimately predict behaviour. The TPB has been applied to consumer food safety behaviour in the past (Clayton & Griffith, 2003). In accordance with the “farm to fork” approach, in our previous work we also tested the effectiveness of the theory of planned behaviour in predicting food safety intentions and self-reported behaviour among food production workers (Nickell & Hinsz, 2004). This study demonstrated the importance of employee attitudes, subjective norms, perceived
behavioural control and behavioural intentions in explaining self-reported food safety behaviour. These results are consistent with the theory of planned behaviour, which proposes that three components ultimately predict intentions: attitude toward performing the behaviour, subjective norm for performing the behaviour, and perceived control over the behaviour. Somewhat unexpected in our study (Nickell & Hinsz, 2004), regression analysis indicated that the subjective norm component ($\beta = .43, p < .001$) made significant contributions to the prediction of behavioural intention, and the correlation between subjective norm and behavioural intention ($r = .67$) was much stronger than in past studies of the TPB (Armitage & Conner, 2001). The TPB states that behavioural, normative, and control beliefs provide the cognitive and affective foundation for attitudes, subjective norms, and perceived behavioural control. Normative beliefs are beliefs about the expectations of others. We also measured perceived normative beliefs with regard to significant others or referent groups that we discovered to be important in preliminary interviews with employees. As predicted by the TPB, perceived normative beliefs with various referent groups (e.g., government inspectors, co-workers) were strongly related to subjective norms ($r = .54$). One of the surprises with regard to normative beliefs was the greater importance placed on certain referent groups (government inspectors and consumers) compared to the weaker importance associated with co-workers.

**Figure 1.** The theory of planned behaviour

![The theory of planned behaviour diagram]

These preliminary results suggest the importance of social norms in the area of food safety. Subjective norms influence one’s intentions, which influence behaviour. Therefore, if food safety behaviour among workers is desired, would highlighting or activating the appropriate social norms increase food safety intentions? Research in other domains has found that salient normative information does impact behaviours and beliefs about student gambling, binge drinking, and body image misperceptions in the expected ways. Cialdini, Bator, & Guadagno (1999) also describe how normative influences might be applied to the workplace.
to reduce undesirable behaviours such as organizational dishonesty. Building upon our previous findings and incorporating the rationale underlying recent work on normative influence, the current study explores the impact of giving employees normative information on the workers’ subsequent food safety intentions, beliefs, and attitudes.

The social norms approach
Social norms represent the general standards, rules, or expectations for appropriate behaviours. Social norms are believed by many social psychologists to represent a powerful source of social influence on numerous human behaviours (Larimer & Neighbors, 2003), including behaviours in the workplace (Cialdini et al., 1999). However some social scientists have criticized the usefulness of social norms in predicting or motivating human behaviour due to the vagueness and generality of the concept. But, the utility of social norms in predicting behaviour can be enhanced if broken down into two types: descriptive and injunctive norms (Cialdini, Reno, & Kallgren, 1990). Descriptive norms describe “what is” common or usual. These norms describe what most people would do, feel or think in a particular setting. Injunctive norms, on the other hand, describe the kinds of behaviours that “ought” to be performed often across situations. “The injunctive meaning of norms refers to rules or beliefs as to what constitutes morally approved and disapproved conduct” (Cialdini et al., 1990, p. 1015). Within the theory of planned behaviour framework, “subjective norms” is often used interchangeably with the concept of injunctive norms (Larimer & Neighbors, 2003). Cialdini et al. (1990) suggest that differentiating injunctive and descriptive social norms is important because both types can exist concurrently in a situation and can have contradictory or matching implications for behaviour. Furthermore, descriptive and injunctive norms can differ in their power and strength across situations. For example, compared to descriptive norms, injunctive information is more motivating across a wider variety of situations and target populations (Cialdini et al., 1990).

Focus theory of normative conduct
Cialdini et al. (1990) developed the focus theory of normative conduct, which asserts that norms should motivate behaviour principally when they are activated or made salient. Cialdini and his colleagues have conducted a number of studies in the area of societally beneficial behaviour (e.g., recycling) that demonstrate the importance of making normative messages more salient. One key finding in their research was that you can sometimes counteract undesirable, descriptive normative behaviours (e.g., most people litter) by making contradictory injunctive norms salient (e.g., littering is against the law).

Cialdini et al. (1999) describes how normative influences can be applied to organizations. Descriptive organizational norms describe what most people do in the organization (e.g., most workers say they follow plant rules about avoiding contamination). Injunctive organizational norms primarily refer to what is expected or approved of by most employees (e.g., most employees feel they should follow plant rules about avoiding contamination). They note that their earlier finding suggest the importance of establishing prompts that increase the salience of a desirable norm (e.g., frequent hand washing) if organizations hope that social norms will be maximally effective.

Larimer & Neighbors (2003) state that questions remain about the range of domains that could be influenced by perceived descriptive and injunctive norms. The current study
explores whether food safety intentions, attitudes, and beliefs can be influenced by this normative approach. While primarily exploratory in nature, we hypothesized that activating both descriptive and injunctive organizational norms would lead to the greatest increase in food safety intentions. Since subjective norms are often correlated with the other constructs identified within the TPB framework, we tested whether norm salience would impact attitudes, subjective norms, normative beliefs, and perceived behaviour control.

Larimer and Neighbors (2003) note that the degree of influence of injunctive and/or descriptive norms may interact with gender, ethnicity, and other demographic variables. For example Larimer and Neighbors found that college women perceived gambling behaviours as occurring more frequently than did men. Thus, we explored the possible moderating effect of gender on norm salience for food safety behaviours, attitudes, and beliefs.

Method
Participants. In May 2004, workers (n=260) at a turkey processing plant were given the opportunity to take home a 125-item questionnaire to be returned several days later. The potential respondents included all plant workers and supervisors, with the exception of managers and front-office personnel. Two-hundred & nine workers (80% of the workforce) took a questionnaire made available by the plant’s human resource department. One hundred & seventy four workers (67%) returned their questionnaire to the researchers and were paid $15 upon completion. Six additional surveys were not used in analyses because they were from recent hires, had very incomplete responses, or were from temporary workers. Therefore, 162 (62.3%) usable surveys are used for the analyses.

The respondents averaged 40.98 years of age (range = 17 – 85 years) and had worked at the plant an average of 8.34 years (range = .02 – 30.00 years). The gender of the respondents (37% females) was also fairly representative of the actual workers (31%). The race/ethnicity of the employees who responded to the questionnaire was reasonably representative of the workforce. White workers account for 62% of the workforce and 72% of the respondents.

Questionnaire. The questionnaire began with a three-page introduction that highlighted some of the results of our previous study, the purpose of the current questionnaire, the $15 compensation, confidentiality of their responses, and definitions of the common questionnaire phrases such as ‘clean and uncontaminated turkey products’ and ‘doing all that is needed to produce clean and uncontaminated turkey products.’ General instructions for completing the various rating scales were provided along with sample questions and potential responses (cf., Ajzen & Fishbein, 1980, Appendix A). Along with demographic questions, the questionnaire included multiple items for each of the following constructs: self-reported behaviour, behavioural intentions, attitude toward the behaviour, subjective norms, perceived behavioural control, normative beliefs, social desirability, and several other constructs not relevant to this paper.

Experimental manipulation. Norm salience was manipulated based on 10 statements provided on the front page of the survey. The summary normative information came from the actual results of a survey completed by workers at the plant one year earlier. Workers in the previous study were told that they would receive feedback from that study. Along with
the feedback in the form of normative or control information, respondents were told that the current survey was a follow-up on the results of the previous survey.

In a 2 X 2 factorial design, we manipulated norm salience by presenting descriptive normative information (Yes or No) and/or injunctive normative information (Yes or No). The 10 statements highlighted one, both, or neither type of organizational norm. In the Descriptive Norm Salience Only condition, five descriptive normative information items concerning food safety (e.g., most employees said they do everything needed to produce clean and uncontaminated turkey products) along with five control statements (e.g., most employees did not think their job was very stressful) were given on the first page. In the Injunctive Norm Salience Only condition, five injunctive normative information items concerning food safety (e.g., employees said they ought to do what is needed produce clean and uncontaminated turkey products) along with the same five control statements were listed on the cover page. In the Combined condition, the same five descriptive and five injunctive norm information statements were given. Finally, in the Control condition, no descriptive or injunctive normative information was given, instead 10 control statements were listed.

**Dependent measures.** For each of the dependent measures constructed, acceptable internal consistency coefficients supported constructing composite scores from the mean of the item responses (see Table 1).

*General self-reported behaviours.* General self-reported behaviours were measured with six items. Some of the items were: ‘How often do you do all that is needed to produce clean and uncontaminated turkey products?’ (1 = never to 7 = always), ‘While doing your job, how often do you produce contaminated or unclean turkey products?’ and ‘I always do all that is needed to produce clean and uncontaminated turkey products’ (1 = strongly disagree to 7 = strongly agree).

*Intentions.* Intentions toward the behaviour were measured with five items, each on 7-point Likert response scales. Sample items are: ‘I (want/ intend/ plan/ desire) to do all that is needed to produce clean and uncontaminated turkey products’ (1 = strongly disagree to 7 = strongly agree).

*Attitude toward the behaviour.* Attitude toward the behaviour was measured with five 7-point semantic differential responses to the same question ‘My doing all that is needed to produce clean and uncontaminated turkey products is’ good-bad, pleasing-annoying, favorable-unfavorable, important-unimportant, enjoyable-unenjoyable.

*Subjective norm.* Subjective norms were measured with five items, each on 7-point Likert response scales. The items included: ‘Most people who are important to me (think I should do/ approve of my doing/ support my doing/ want me to do) all that is needed to produce clean and uncontaminated turkey products,’ (1 = strongly disagree to 7 = strongly agree).

*Perceived behavioural control.* Perceived behavioural control was measured with five items. Sample items included: ‘Even if I wanted to, it would be difficult for me to do all that is needed to produce clean and uncontaminated turkey products.’ (7 = strongly disagree to 1 =
strongly agree), ‘For me to do all that is needed to produce clean and uncontaminated turkey products is...’ (7 = extremely easy to 1 = extremely difficult). ‘How much control do you have over whether you can do all that is needed to produce clean and uncontaminated turkey products?’ (1 = completely no control to 7 = complete control), and ‘It is mostly up to me if I do all that is needed to produce clean and uncontaminated turkey products’ (1 = strongly disagree to 7 = strongly agree).

**Normative beliefs.** Normative beliefs (NB) consisted of two multiplicative components: normative belief strength (nb) and motivation to comply (mc). Normative beliefs involve the perception that specific significant others believe the person should perform the behaviour or not (e.g., ‘My supervisors think I should do all that is needed to produce clean and uncontaminated turkey products’). Motivation to comply (mc) involves willingness to comply with the desires of the specific significant others (e.g., ‘Generally speaking, I want to do what my supervisors think I should do’). A measure of normative beliefs (NB) was obtained by multiplying nb with mc for seven pairs of beliefs that were generated from a previous study (Nickell & Hinsz, 2004). The normative belief strength (nb) items were scored using a (-3 = strongly disagree to +3 = strongly agree) scale while the motivation to comply (mc) items were scored using a (1 = strongly disagree to 7 = strongly agree) scale. Scores for each normative belief could range from -21 to +21. A composite normative beliefs (NB) score was constructed from the means of these seven product scores.

**Social desirability.** Social desirability was measured with nine items from the Impression Management scale of the Balanced Inventory of Desirable Responding (Paulhus, 1984). A (1 = not at all true of me to 7 = completely true of me) response scale was used. A composite score was constructed from the sum of responses to the nine items.

**Results**

Intercorrelations, coefficient alphas, means, and standard deviations of the measures involved in the analyses are presented in Table 1. It is important to note that mean scores were very high particularly for intention and subjective norms, indicating that the workers at this plant had positive reactions to avoiding contamination and trying to keep the food safe. This could possibly represent a ceiling effect for specific measures. Even with strong assurances of privacy and confidentiality detailed in the instructions of the survey, one problem that remains with self-report measures in work settings is the possibility of responding in a socially desirable fashion. Consequently, we included a social desirability measure in an attempt to control for this issue. Social desirability was significantly correlated with each the other measures (p < .01). Therefore, social desirability is used as a covariate in all subsequent analyses.
Pearson correlations were computed to examine expected interrelationships among the key components of the theory of planned behaviour (see Figure 1). As expected, correlational analyses showed significant interrelationships among all key components of the theory of planned behaviour (see Table 1). Attitude toward food safety behaviour, subjective norm, and perceived behavioural control were all strongly related to behavioural intention. In addition, behavioural intention and perceived behavioural control were significantly correlated with general self-reported behaviour. These results are consistent with our previous study (Nickell & Hinsz, 2004).

A regression analysis was conducted to determine if intentions could be predicted by attitudes toward the behaviour, subjective norms, and perceived behavioural control. This regression equation was significant, $F(3, 158) = 68.30, p < .001$, accounting for 57% of the variance in intentions. The attitude ($\beta = .36, t = 5.50, p < .001$) and subjective norm ($\beta = .47, t = 7.29, p < .001$) components contributed significantly to the equation while perceived behavioural control did not ($\beta = .02, t = 0.36, p > .72$). The absence of an effect for perceived behavioural control is consistent with previous analyses with intentions to avoid contamination (Nickell & Hinsz, 2004) and can be expected with specific behaviours (Armitage & Conner, 2001). These analyses demonstrate that substantial variance in our intention measure can be accounted for by measures of the attitude toward the behaviour and subjective norms regarding the behaviour.

We expected that self-reports of behaviours to keep the food safe and uncontaminated could be predicted by intentions and perceived behavioural control. Consistent with the theory of planned behaviour, behavioural intention ($\beta = .56, t = 6.73, p > .001$) and perceived behavioural control ($\beta = .31, t = 5.44, p > .001$) made significant contributions to predicting general self-reported behaviours, $F(2, 159) = 97.17, p < .001$, and accounted for 55% of the variance. These results are very consistent with our previous study (Nickell & Hinsz, 2004).

Table 1: Intercorrelations, Coefficient Alphas, Means and Standard Deviations for Dependent Measures

<table>
<thead>
<tr>
<th>Measures</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. General self-reported behaviour</td>
<td></td>
<td>.79</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5.85</td>
<td>.97</td>
</tr>
<tr>
<td>2. Behavioural intentions</td>
<td></td>
<td>.68</td>
<td>.70</td>
<td></td>
<td></td>
<td></td>
<td>6.33</td>
<td>.74</td>
</tr>
<tr>
<td>3. Attitudes toward the behaviour</td>
<td></td>
<td>.70</td>
<td>.64</td>
<td>.79</td>
<td></td>
<td></td>
<td>5.95</td>
<td>.95</td>
</tr>
<tr>
<td>4. Subjective norm</td>
<td></td>
<td>.59</td>
<td>.69</td>
<td>.56</td>
<td>.82</td>
<td></td>
<td>6.21</td>
<td>.71</td>
</tr>
<tr>
<td>5. Perceived behaviour control</td>
<td></td>
<td>.53</td>
<td>.39</td>
<td>.46</td>
<td>.42</td>
<td>.56</td>
<td>5.24</td>
<td>1.01</td>
</tr>
<tr>
<td>6. Social desirability</td>
<td></td>
<td>.40</td>
<td>.29</td>
<td>.37</td>
<td>.22</td>
<td>.16</td>
<td>.78</td>
<td></td>
</tr>
</tbody>
</table>

Note: Coefficient alphas are presented in boldface along the diagonal. All correlation coefficients are significant at $p < .05$
Means and standard deviations for the normative beliefs measures specified by the different referent groups are presented in Table 2. As can be seen, consumers and inspectors were seen as most important while co-workers were seen as less influential.

### Table 2: Means and Standard Deviations for Normative Beliefs by Referent Groups

<table>
<thead>
<tr>
<th>Referent Group</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumers</td>
<td>16.67</td>
<td>5.36</td>
</tr>
<tr>
<td>USDA inspectors</td>
<td>15.97</td>
<td>6.27</td>
</tr>
<tr>
<td>Clients</td>
<td>15.87</td>
<td>6.02</td>
</tr>
<tr>
<td>Family and friends</td>
<td>14.75</td>
<td>6.37</td>
</tr>
<tr>
<td>Management/big bosses</td>
<td>14.68</td>
<td>6.98</td>
</tr>
<tr>
<td>Supervisors</td>
<td>14.55</td>
<td>6.83</td>
</tr>
<tr>
<td>Co-workers</td>
<td>10.55</td>
<td>7.35</td>
</tr>
<tr>
<td>Composite score</td>
<td>14.71</td>
<td>5.17</td>
</tr>
</tbody>
</table>

In addition to the injunctive and descriptive normative information variables, for most of the analyses, we include the gender of the worker as a potential moderating variable. Our key prediction was that norm salience would positively influence behavioural intentions. The results showed no significant main effects for injunctive normative information ($p = .32$) nor descriptive normative information ($p = .40$) on intention. In addition, there was no interaction between injunctive and descriptive norm salience ($p = .68$). While there was no overall gender differences for intentions ($p = .34$), there was a significant gender by injunctive norm interaction effect, $F (1, 144) = 7.15, p = .008$. Females had higher food safety intentions when injunctive norms were salient ($M = 6.47$ vs. $M = 6.26$), while male workers had higher intentions when injunctive norms were not salient ($M = 6.52$ vs. $M = 6.20$).

The results showed no significant main effects for injunctive normative information ($p = .70$) nor descriptive normative information ($p = .83$) on attitude toward the behaviour. In addition, there was no interaction between injunctive and descriptive norm salience ($p = .63$). There was no overall gender differences for attitude toward the behaviour ($p = .78$) nor interactions.

With regard to subjective norms, the results were very similar to attitude toward the behaviour. The results showed no significant main effects for injunctive normative information ($p = .69$) nor descriptive normative information ($p = .20$) on subjective behaviour. In addition, there was no interaction between injunctive and descriptive norm salience ($p = .60$). There was no overall gender differences for subjective norms ($p = .36$) nor interactions.
It was unclear if normative information would impact perceived behavioural control. The results showed no significant main effects for injunctive normative information ($p = .84$) nor descriptive normative information ($p = .77$) on perceived behaviour control. In addition, there was no interaction between injunctive and descriptive norm salience ($p = .33$). Again there was no overall gender differences for perceived behavioural control ($p = .34$), but there was a significant gender by injunctive norm interaction effect ($F (1, 144) = 5.22, p = .024$). Females had higher perceived behavioural control when injunctive norms were salient ($M = 5.43$ vs. $M = 5.01$), while male workers had higher perceived behavioural control when injunctive norms were not salient ($M = 5.46$ vs. $M = 5.14$).

It was expected that perceived normative beliefs would be influenced by making normative information salient, but the nature of the effect was unclear since the composite normative belief measure is a combination of seven different specific significant other groups. Overall there were neither significant main effects nor interactions for the composite normative belief measure ($p > .05$).

Conclusions
Although not the major purpose of this study, the results again show strong support for the utility of the theory of planned behaviour to predict behavioural intentions and general self-reported food safety behaviours of turkey processing workers. As expected, behavioural intention and perceived behavioural control predicted general self-reported behaviour. In addition, attitude toward behaviour and subjective norm predicted behavioural intention.

The use of descriptive and injunctive normative salience manipulations did not have the predicted impact on the food safety intentions of the food production workers. While the use of injunctive normative information did increase intentions on the part of women, the opposite effect was found for male employees. The underlying rationale for this effect is still unclear. Additionally, the presentation of descriptive and injunctive normative information did not influence attitude or subjective norm responses. These patterns of results make it difficult to recommend the practical use of injunctive norms with a mixed gender group of employees. Although normative information may have substantial impact on other behaviours (e.g., binge drinking), results from this sample of food processing workers suggest that normative information effects are not boundless.

Why did the normative information manipulation have so little effect? Was the manipulation simply too weak or were the organizational injunctive and descriptive food safety norms already quite strong for these employees? From our previous interviews with management, supervisors and employees, there already appeared to be both a climate and culture of food safety within this organization. Organizational researchers often talk about normative behaviour based on the climate and culture of an organization (Cialdini et al., 1999). Cialdini et al. (1999) states that organizational climate mainly describes what most employees do or the descriptive norms; organizational culture reflects what is expected or approved of or injunctive norms. They also indicate that greater adherence to organization injunctive norms may be expected (e.g., frequent handwashing) depending on the intensity and presence of crystallization. Intensity refers to the strength of the approval or disapproval responses to certain behaviours. Crystallization “refers to an almost unanimous agreement on the content of important values among group members” (Cialdini et al., 1999, p. 202). The workers in
the current study were mostly long time employees \( (M \text{ tenure} = 8.34 \text{ years}) \), thus there is good possibility that employee food safety social values or norms were already intense and highly crystallized. In addition, intention scores were quite high in the current study and in the previous study of these same employees (Nickell & Hinsz, 2004) making a significant increase in intention difficult.

While the use of adding normative information was not very effective in this particular work environment, there is reason to speculate that normative information should be important in other situations (e.g., fast food restaurants) where employee turnover is high and employees are less committed to their organizations. In these work environments, food safety social norms would likely be less intense and crystallized. In these types of work settings, constantly highlighting injunctive social norms would seem to be important part of a manager’s job. The use of normative feedback in other domains has also been more effective in changing behaviours, attitudes, and beliefs when misperceptions exist about the normative behaviour (e.g., weekly alcohol use) and the new normative information helps to clarify the misperception. There seemed to be little misperception about the importance of food safety behaviour in the current organization. However, normative information feedback might be very helpful with the food safety behaviour of consumers who are likely to have misperceptions about the importance of frequent handwashing in their own kitchens. Future research should explore these other settings where social norm feedback could play a more important role in food safety behaviours.

References


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