Resistance to Change Regular Travel Behaviour: Self-identity Threat, Previous Travel Behaviour and Psychological Reactance

by

Niamh Murtagh, Birgitta Gatersleben and David Uzzell

RESOLVE Working Paper 01-11

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ESRC Research Group on Lifestyles, Values and Environment
Centre for Environmental Strategy
University of Surrey
Guildford GU2 7XH, UK
http://www.surrey.ac.uk/resolve/

Contact details:
Niamh Murtagh: email - N.Murtagh@surrey.ac.uk
Tel: 01483 682879

Abstract

Despite widespread acceptance of the need to change individual behaviour towards sustainability, resistance to change remains a continuing challenge. Previous behaviour or habit, and psychological reactance, have been explored as components of resistance. Growing evidence for the influence of self-identity on behaviour suggests self-identity as a further, potentially important factor. The current study draws on Identity Process Theory (Breakwell, 1986) to propose that threat to self-identity contributes to resistance to change, over and above the influence of previous behaviour and reactance. Using travel-related vignettes to trigger threat, a study with 300 working parents in England found evidence supporting the relationship between self-identity threat and resistance to change travel behaviour. In addition to contribution to theoretical understanding of identity, the findings may have wider application to social reactions to climate change. The implications for policy and communication about sustainability are discussed.

1 Introduction

Behaviour change by individuals is one important response for both preventing the acceleration, and reducing the impacts, of climate change (Christie, 2010) . The potential impacts of climate change are accepted by the majority of the population in the UK (Carrington, 2011), despite some increases in perceived levels of cynicism and mistrust in climate science over the last year (Spence, Venables, Pidgeon, Poortinga, & Demski, 2010). Not only do most people believe climate change is happening and are concerned about it, but a majority also agree that they are prepared to reduce their energy use to aid mitigation of the risks (ibid.). However, behaviour patterns continue to show increased demands for energy use rather than the reductions agreed to in public opinion surveys (Stoll-Kleemann, O'Riordan, & Jaeger, 2001). A pertinent example is the increase by 8% between 1998 and 2008 of the distance travelled by car (DfT, 2009). Given the evidence for personal travel as the highest contributor of UK household greenhouse gas emissions after domestic energy (Druckman & Jackson, 2009), the failure to change travel behaviour merits further investigation and travel behaviour is therefore the focus of the current study.

The mismatch between responses to surveys of values, attitudes or beliefs and actual behaviour has been termed the 'value action gap' and has been widely documented in relation to a range of sustainable behaviours (Chung & Leung, 2007; Flynn, Bellaby, & Ricci, 2009). Amongst the many factors postulated to contribute to the gap are previous behaviour and psychological reactance. We now briefly review the evidence for previous behaviour and reactance as contributing to the broader construct of resistance to change, and argue that threat to identity is an additional contributing factor.

Resistance to change is a psychological phenomenon of long-standing interest in many applied branches of psychology, from health to organisational psychology. Resistance to change has been seen as an almost inevitable response to required change (Dent & Goldberg, 1999), a universal tendency (Rogers, 1965), and a personality trait (Oreg, 2003). Research approaches have positioned it as a barrier to overcome (Albarracin, Durantini, Earl, Gunnoe, & Leeper, 2008) or, on the contrary, as a resource with which to work (Ford & Ford, 2010).

Previous behaviour as a predictor of future action has been acknowledged (Ajzen, 1991), with empirical support for its contribution over and above attitudes and intentions (Ouellette & Wood, 1998). Frequent behaviour that is experienced as successful is likely to be repeated (Aarts, Verplanken, & van Knippenberg, 1998), leading to habitual patterns. Repeated behaviour or habit may reduce or simplify demands on cognitive resources. A key feature of habitual behaviour is its non-deliberative nature (Gärling & Axhausen, 2003), making appeals to reason or judgement ineffective. Disrupting repeated or habitual behaviour can be difficult, thus repeated previous behaviour may be a component of resistance to change (Stoll-Kleemann, et al., 2001). Although repeated previous behaviour

and habit have been used synonymously (Verplanken, Aarts, & Van Knippenberg, 1997), and travel mode is proposed as an habitual behaviour (ibid.), some authors differentiate between the two concepts, defining habit as goal-oriented and automatic (Aarts et al, 1998; Ouellette & Woods, 1998). In this paper, we take previous behaviour as the broader construct, while acknowledging its likely overlap with habit.

However, resistance to change has been argued to result from psychological factors more complex than behaviour patterns or cognitive efficiency (Bovey & Hede, 2001). Psychological reactance theory (Brehm, 1966) posited resistance as an aspect of counteractive behaviour elicited by a perceived threat to freedom. Brehm's theory argued that individuals maintain the belief that they are free to engage in a range of behaviours, and that reactance is experienced when a behaviour believed to be 'free' is prevented or threatened with prevention (ibid.). Individuals may vary on trait reactance, that is, a generalised tendency to non-compliance or to resist influence and advice from others (Pavey & Sparks, 2009). Distinct from trait reactance, state reactance is defined as a motivation aimed at restoring behavioural freedom. The strength of (state) reactance derives from the importance of the threatened freedom in satisfying important needs. Reactance theory (Brehm, 1966) does not define these needs but definition is crucial to conceptualising 'freedom' and therefore reactance within a theoretical framework that can be related to other theories of psychological processes. Nonetheless, some theoretical relationships have been suggested. Brehm and Brehm (1981) proposed that a sense of competence or self-efficacy was a pre-requisite for reactance to occur. Hellman and McMillin (1997) linked reactance to self-esteem. Thus reactance may be a second order motivation, based on more fundamental needs that relate to a central sense of self-identity. We use the term 'self-identity' to encapsulate the concept of 'self-ness' within the self-concept: an individual's internal answers to the question 'Who am I?'

Empirical work has begun to establish self-identity as an influence on behaviour (Falomir & Invernizzi, 1999; Gray, Amos, & Currie, 1997; Nuttbrock & Freudiger, 1991; Oyserman, Fryberg, & Yoder, 2007; Sparks & Shepherd, 1992) and some findings point to the involvement of self-identity in resistance to change behaviour. Hansen, Winzeler and Topolinski (2010) found that participants who rated smoking as important to their self-esteem were, perversely, more likely to rate smoking as positive after exposure to health warnings such as "Smoking Kills". Liberman and Chaiken (1992) demonstrated that personal relevance heightened defensiveness in response to threatening messages, and defensiveness may be triggered by threats to important parts of self-image (GinerSorolla & Chaiken, 1997; Tesser & Cornell, 1991). Theoretical perspectives on self-identity too have argued that identities guide actions chosen or resisted (e.g. Stryker, 1987). In particular, Identity Process Theory (IPT; Breakwell, 1986) proposed mechanisms by which threats to self-identity could result in resistance to change behaviour.

Identity Process Theory (Breakwell, 1986) postulated a comprehensive framework for self-identity, encompassing content, structure and processes. Its fundamental tenet was that the self operates in compliance with specific guiding principles in such a way as to protect itself from threat. Guiding principles of self-esteem, self-efficacy, continuity of the self through time and distinctiveness, or a positive sense of uniqueness, were proposed. Circumstances in which one or more of the principles are undermined are experienced as threatening and will

trigger coping strategies. A range of strategies for coping with threat is potentially available and the strategies may be categorised, for the purposes of the current discussion, as deflecting or accepting. Deflection strategies include denial of the existence of a threat, reconstrual of its meaning, and negativism, or confronting the source of threat. Acceptance strategies include re-evaluation of principles and fundamental identity change. Building from Breakwell's theory, it can be suggested that deflection strategies, in defence of the self under threat, may result in resistance to change. This theoretical insight guided the current research which aimed to contribute to understanding of resistance to change: our study sought to test whether identity threat, as defined in Identity Process Theory, contributed to resistance to change.

Theoretical framings of identity acknowledge that identities are multiple: each individual manages a range of identities, some contextual, some chronically salient (Stryker, 1987). Sociological role theory defines identities as internalisation of the expectations and norms associated with social roles (Stryker & Burke, 2000). Thus an identity of 'parent' will comprise the expectations around behaviour and attitudes, which individuals believe others, within their culture and context, hold regarding that role. The individual's behaviour in the role is likely to be congruent with those beliefs. In considering identity threat, then, threats may be experienced as targeted at specific identities.

An earlier study linked identities to travel mode choice and demonstrated that both travel-related and social identities were related to travel behaviour (Murtagh, et al., under review). Amongst the identities relating to travel for which this study found empirical support were 'motorist' and 'parent'. These two identities, one travel-related and one social, were selected for investigation here. In the absence of empirical findings to suggest differences between identities in how threat would relate to resistance to change, we postulated that threat to either would contribute to resistance.

Drawing together the objectives to examine whether self-identity threat contributes to resistance to change, in the domain of travel behaviour, in addition to previous travel behaviour and psychological reactance, with theory and research on the multiplicity of identities, the research hypotheses were:

H1: Self-identity threat is related to resistance to change travel behaviour.
H2: Self-identity threat contributes to resistance to change, over and above previous travel behaviour and psychological reactance. .
H3a: Threat to a transport identity contributes to resistance to change travel behaviour.
H3b: Threat to a social identity contributes to resistance to change travel behaviour.

2. Method

Given that real threats to self-identity may, by definition, cause distress, the study design used vignettes (short descriptive scenarios) and asked participants to imagine themselves in the scenarios depicted. Participants' perception of the level of threat to self-identity was measured. In addition, a vignette design allowed control of individuals' personal circumstances: instead of seeking to capture the complexity of individuals' travel mode choices (distance to work, school, public transport, and so on), relatively simple travel vignette were presented as standard to all participants within each group.

2.1 Participants

The experimental material, vignettes depicting travel-related scenarios, were based in urban or suburban settings, and referred to travel to work, school or other local journeys. For optimal fit with participants' circumstances, target participants were therefore working, owned a car and were recruited in several urban and suburban locations across England. Additionally, participants had a personal income at or over the national average (£25,000, approximately €30,000) per annum: disposable income may relate to perceptions of choices in travel mode (Anable, 2005). One of the two sets of vignettes was targeted at parents: participants recruited for this set were additionally parents of primary school-age children. A national team of field researchers collected the data in July 2010, by visiting random households in locations with socioeconomic categories of skilled manual, clerical, junior and intermediate occupations. Response rate was estimated at 10%.

Table 1 presents the demographic data. The sample was in line with national population estimates of 88% White or White British (ONS, 2010), although with limited representation of other groups.

	Total Sample (N=299)	Parent Subgroup (N=150)	Motorist Subgroup (N=149)
Gender			
Female	62%	67%	57%
Male	38%	33%	43%
Age			
Mean	40.19	37.14	43.18
SD	9.43	6.94	10.56
Range	23 - 69	23 – 56	25 - 69
Ethnicity			
White/White British	90.6%	93.3%	87.9%
Asian/Asian British	3.3%	4.0%	2.7%
Black/Black British	3.7%	2.7%	4.7%
Mixed	2%		4.0%
Other	0.3%		0.7%

Table 1: Demographic Data

2.2 Procedure

The study comprised a paper questionnaire, completed by participants in their home. Participants were assured of anonymity, confidentiality and the right to opt out. Two forms of questionnaire were presented, one of which presented vignettes relevant to parents, the other of which presented vignettes relevant to motorists. The format of the two forms was identical: half of the participants were presented with one form, half with the other. An initial short priming task required the participant to write between three and six sentences on how being a parent or a motorist was important to them. This was to ensure that the target identity was salient. Baseline measures of emotion, future intentions regarding travel mode, and identity factors were then requested, followed by the presentation of eight vignettes. The participants was asked to read each vignette and answer items for each one on intention to change travel behaviour, the perceived level of threat to identity and freedom posed by the vignette, and the perceived level of power of the instigator of change in the vignette to enforce changed behaviour. After the vignettes, the participants completed demographic details, measures of identity centrality and salience, trait reactance, previous transport behaviour, and repeated measures of emotion and identity factors. The vignettes required about 20 minutes to complete. No incentives were offered.

2.3 Material

All vignettes described a travel-related scenario (see Appendix for examples). In each set, four vignettes were designed to threaten the target identity and four were designed as neutral with respect to identity threat. Of the threat vignettes, two were designed to include a powerful figure or institution as the instigator of change to travel behaviour, for example, the government or local authority. The remaining two threat vignettes included a non-powerful instigator of change, for example, other parents. The source of threat was controlled in this way because of evidence that the level of threat can depend on the source (Invernizzi, Falomir-Pichastor, Munoz-Rojas, & Mugny, 2003). The neutral vignettes also included a mix of powerful and non-powerful instigators of change. The vignettes were balanced on length, and on the cost, time and convenience required to make a change. Responses to the vignettes were measured as described below.

2.4 Measures

Resistance to Change

Using intention as a proxy for behaviour in line with the Theory of Reasoned Action (Ajzen & Fishbein, 1974) and Theory of Planned Behaviour (Ajzen, 1988), Resistance to Change Travel Behaviour was measured as the inverse of intention to change, with a single item for each of the 8 vignettes. The item was phrased in positive terms: "How likely is it that you would intend to change your behaviour?", worded appropriately for each vignette, for example "How likely is it that you would intend to have your child walk to school more often?" [Parent Vignette 2]. The response was on a six-point scale, anchored at "Very unlikely" (scored as 1) and "Very likely" (scored at 6). Resistance to change was calculated as the reverse scores, for example, a response of '1' on the item represented a score of '6' for Resistance to Change.

Identity Threat

Threat to identity was measured with 4 items for each of the 8 vignettes. One item each assessed the threat to self-esteem, generalised self-efficacy, continuity and distinctiveness, that is, the four guiding principles of the self-concept defined in Identity Process Theory (Breakwell, 1986). The items were "It undermines my sense of self-worth", "It makes me feel less competent", "I would have to change who I am", "It makes me feel less unique as a person". Each item was rated on a six-point scale, anchored at "Very unlikely" (scored as 1) and "Very likely" (scored at 6) and identity threat was the mean of the 4 items. Cronbach alpha was calculated for each vignette and all scores were above 0.9.

Psychological Reactance

Psychological reactance was measured with 2 items per vignette. One item assessed the perceived threat to freedom: "It threatens my freedom". The other item assessed the perception of power to enforce change by the instigator of change in the vignette, for example, "The council has the power to make me change what I do" (Parent vignette 1). These items were used separately in the analysis.

Previous travel behaviour

Previous or habitual travel behaviour was measured with one question covering four items: 'In general, how often do you do the following for local journeys? Cycle / Use local bus / Walk / Take a train, tube or tram?', with a fifth item on the Parent questionnaire: 'Allow your children to walk (accompanied or unaccompanied)?'. The items were anchored at 1 'Rarely or never' to 5 'Very often'. These items were used separately in the analysis.

Control Variables

State emotion

Positive and negative emotions were measured before and after the participant had reviewed the vignettes. The PANAS scale (Watson, Clark, & Tellegen, 1988) was used. Cronbach alpha was .86 and .91 for pre-test positive and negative affect respectively, and .90 and .87 for post-test positive and negative affect respectively.

Trait Reactance

Trait reactance is defined as a characteristic tendency to react negatively or to reject new information or suggestions. It was measured using the Hong Psychological Reactance Scale (Hong & Faedda, 1996). The scale showed good reliability (α = .83).

Identity Centrality and Salience

Identity centrality and identity salience have been argued to represent complementary measures of identity importance (Stryker & Serpe, 1994) so both were measured. Identity centrality was measured using one item based on Vignoles et al. (2006): "How important is being a motorist/parent in defining who you are?". Identity salience was measured using three items from Callero (1985): "Being a motorist/parent is something I rarely even think about", "I really don't have any clear feelings about being a motorist/parent", and "For me, being a motorist/parent means more than just driving/looking after children". Reliabilities were initially moderate (both motorist and parent identity salience α = .64). Removing the third item improved reliabilities to .81 for motorist identity and .82 for parent identity so the two-item scale was used in subsequent analysis.

Baseline Intention to Change

To control for previous intention to change travel behaviour, one item was used: "I intend to drive less in the future", anchored at 1 (Strongly disagree) to 6 (Strongly agree). This was embedded with seven similar decoy items which referred to intending to get fitter, lose weight, cycle and spend more time outdoors.

Baseline Identity Factors

As the vignettes were designed to threaten particular identity factors, the identity factors, self-esteem, self-efficacy, continuity and distinctiveness, as defined in Identity Process Theory (Breakwell, 1986), were measured pre- and post-presentation of the vignettes. The theory suggested that coping strategies mitigate most threat rapidly, but it may be possible for threat to persist over time. By measuring both perception of threat for the vignettes, and pre- and post-levels of threat, we could assess whether threat had been triggered, and whether any perception of threat had persisted in time. Self-esteem was measured with one item: "I have high self-esteem", rated on a 5-point scale, anchored at 1 (Not very true of me) and 5 (Very true of me), validated by Robins, Hendin and Trzesniewski (2001). Generalised self-efficacy was measured using an 8-item scale validated by Chen, Gully and Eden (2001). Both pre- and post-measures showed very good reliability (α = .93 for both measures). Continuity and distinctiveness were each measured on 2-item scales developed for this study. The items measuring continuity were: "I have not changed much over time", "I am the same person I always was". Reliability was adequate (α = .69). The distinctiveness items were: "I feel I am different from other people in a good way", "I am unique as a person" (α = .57). All items were rated on a 5-point scale, anchored at 1 (Not very true of me) to 5 (Very true of me).

Data Analysis

The data were inspected and tested for univariate, and multivariate outliers. One case was excluded because of age given as 12 years; one case was excluded as a multivariate outlier identified using Mahalanobis' distances; and three cases were excluded as univariate outliers based on standardised scores. The analyses below were carried out on the full sample of 295, with 149 participants in the parent subgroup and 146 in the motorist group. Few items were missing and these were excluded listwise from analyses. Overall intention to change, and intention to change for both subgroups, was normal. Overall identity threat was positively skewed, and was dealt with as described below.

3. Results

Table 2 presents the means and standard deviations of the main variables and Table 3 presents correlations between the main variables. In the tables, the identity factors (self-esteem, self-efficacy, continuity and distinctiveness) and affect are the baseline, pre-vignette measures.

	All (N=295)		Motorist (N=146)		Parent (N=149)	
	Mean	SD	Mean	SD	Mean	SD
Resistance to change	4.06	1.15	4.65	1.04	3.49	.96
Identity threat	2.38	1.26	2.59	1.43	2.17	1.03
Reactance: threat to freedom	3.02	1.48	3.43	1.52	2.62	1.33
Reactance: power	2.36	1.19	2.43	1.24	2.28	1.14
Identity salience	4.23	1.40	3.53	1.31	4.92	1.11
Identity centrality	4.83	1.35	4.40	1.53	5.24	1.00
Trait reactance	3.17	.67	3.24	.66	3.10	.68
Baseline intention to change	2.84	1.53	2.43	1.34	3.24	1.60
Previous behaviour:						
Walk	3.41	1.18	3.06	1.23	3.74	1.02
Cycle	1.67	1.05	1.51	.91	1.82	1.15
Bus	1.96	1.12	1.83	1.08	2.09	1.15
Train	2.03	1.13	1.97	1.04	2.09	1.21
Children walk	3.14	1.56	-	-	3.14	1.56
Self-esteem	3.30	1.03	3.30	1.04	3.31	1.03
Self-efficacy	3.72	.68	3.77	.68	3.68	.68
Continuity	3.09	.54	3.08	.51	3.10	.56
Distinctiveness	3.38	.85	3.34	.85	3.42	.85
Positive affect	2.63	.84	2.53	.78	2.73	.88
Negative affect	1.36	.50	1.30	.46	1.41	.54

Table 2: Means and Standard Deviations of Main Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Age																				
2. Gender†	.07																			
3. Resistance to change	.23*	.14*																		
4. Identity threat	.03	-.01	.33**																	
5. Reactance: power	.09	-.13*	.10	.64**																
6. Reactance: threat to freedom	.02	.01	.47**	.76**	.51**															
7. Baseline intention to change	-.15*	-.12*	-.37**	-.05	.19**	-.15*														
8. Identity salience	-.14*	-.03	-.14*	-.03	-.14**	-.07	-.12*													
9. Identity centrality	-.13*	-.02	-.05	.22**	.11	.15*	.01	.48**												
10. Trait reactance	-.01	.03	.28**	.28**	.13*	.37**	-.10	.03	.12*											
11. Previous behaviour: walk	-.13*	-.19**	-.45*	-.14*	-.04	-.21**	.27*	.04	.02	-.18*										
12. Previous behaviour: cycle	-.11	.01	-.03	.05	.07	-.01	.23**	.02	.07	.11	.16**									
13. Previous behaviour: bus	.05	-.13*	-.28**	-.05	.09	-.20**	.26**	-.09	.04	-.21*	.30**	.07								
14. Previous behaviour: train	-.05	-.09	-.17*	-.02	.05	-.13*	.18*	-.07	.03	-.09	.25**	.04	.37**							
15. Previous behaviour: children walk	.15	.07	-.16	-.07	-.18*	-.20*	.08	.10	-.09	-.12	.33**	-.07	.00	.10						
16. Self-esteem	.03	.12*	.01	.06	-.06	.06	.02	.05	.22**	.14*	-.08	.05	.06	.07	.04					
17. Self-efficacy	.02	.11	.01	-.08	-.21**	-.03	-.06	.08	.14*	.08	.03	.01	-.06	.04	.20*	.52**				
18. Continuity	-.04	-.01	-.01	-.02	.01	-.03	-.03	.05	.05	-.16*	.00	-.05	.10	-.07	-.04	.04	.07			
19. Distinctiveness	-.09	.06	.00	-.04	-.13*	.03	.01	-.05	.06	.14*	-.02	.16**	.02	.15*	.02	.41**	.42**	.05		
20. Positive affect	-.11	-.02	-.16*	-.07	-.16**	-.04	.11	.21**	.12*	-.08	.14*	-.08	.02	.02	.13	.26**	.26**	.09	.17**	
21. Negative affect	-.10	-.04	-.05	.23**	.20**	.17**	.05	.01	.06	.08	-.03	.05	.05	.03	-.10	.00	-.07	.05	.04	.04

**Table 3**: Correlations between Main Variables

Note. * $p < .05$, ** $p < .01$

† 1= Female, 2 = Male

The correlation between threat to freedom (an aspect of state psychological reactance) and identity threat was .76 (p = .000) and this would imply that there is overlap between the constructs. The lack of definition of threat to freedom, noted in the Introduction above, limits further exploration of state reactance. Trait reactance is used in the regression analysis below.

As a manipulation check that the vignettes had induced threat, differentially between neutral and threat conditions, and across both motorist and parent subgroups, we conducted a mixed-design analysis of variance of identity threat with one repeated condition (threat versus neutral vignettes). Because identity threat for the full set, and for the motorist subgroup, was skewed, the variables were first transformed by calculating the square root. The mean identity threat was higher for the threat vignettes, for both motorist and parent subgroups (mean for threat vignettes: motorist = 2.95, parent = 2.47; mean for neutral vignettes: motorist 2.39, parent = 2.15; see Figure 1). The effect of identity threat was significant ($F(1,293)$ = 69.01, p = .00), demonstrating that the vignette design had induced threat. The interaction was non-significant ($F(1,293)$ = 1.02, p=.31), showing that the level of threat did not differ significantly between the motorist and the parent subgroups.

Figure 1: Mean Level of Identity Threat for Threat versus Neutral Condition
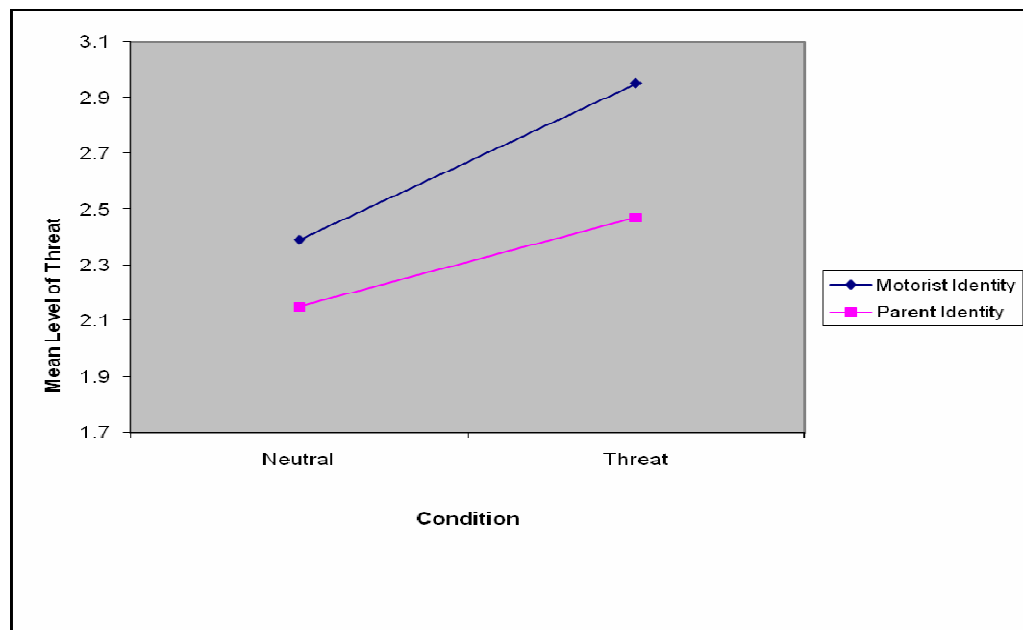
Several control variables were measured pre- and post-presentation of the vignettes. As a further manipulation check, t-tests were conducted on pre- and post- measures of state affect and identity factors (self-esteem, self-efficacy, continuity and distinctiveness). Mean positive affect was lower post-vignettes (pre = 2.63, post = 2.49, $t(294)$ = 3.68, p = .00), which is consistent with the experience of threat. Pre- and post-vignette measures of negative affect did not differ significantly. Mean measures of self-esteem, self-efficacy and continuity were not significantly different post-

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vignette presentation. However, mean distinctiveness increased significantly (pre = 3.39, post = 3.50, $t(294)$ = -2.67, p = .01). This is in line with Identity Process Theory (Breakwell, 1986), which suggested that, in general, identity factors would not vary because coping strategies operate to mitigate a threat, but that, conversely, threat could persist in some circumstances. Distinctiveness may have become stronger as a reaction to threat or as a result of the focus on individual judgement in the vignettes. Overall, the pattern of manipulation checks on pre- and post-presentation measures support the experience of threat in response to the vignettes. In the analyses below, the pre-vignette measures were used. As a first test of our main hypothesis, that threat to identity would relate to resistance to change travel behaviour, we conducted a mixed-design analysis of variance of resistance to change, with threat versus neutral vignettes as the repeated condition. The mean resistance to change was higher for the threat vignettes, for both motorist (threat mean 5.28, neutral mean 4.56) and parent (threat mean 3.86, neutral mean 3.39) subgroups (see Figure 2). The effect of threat on resistance to change was significant $(F(1,293)$ = 50.25, p = .00; r = .38) and this effect did not differ significantly between the subgroups $(F(1,293)$ = 2.38, p = .12). This supports Hypotheses 1 and 3, that threat to identity is related to resistance to change, and that this holds for threat to both transport and social identities.
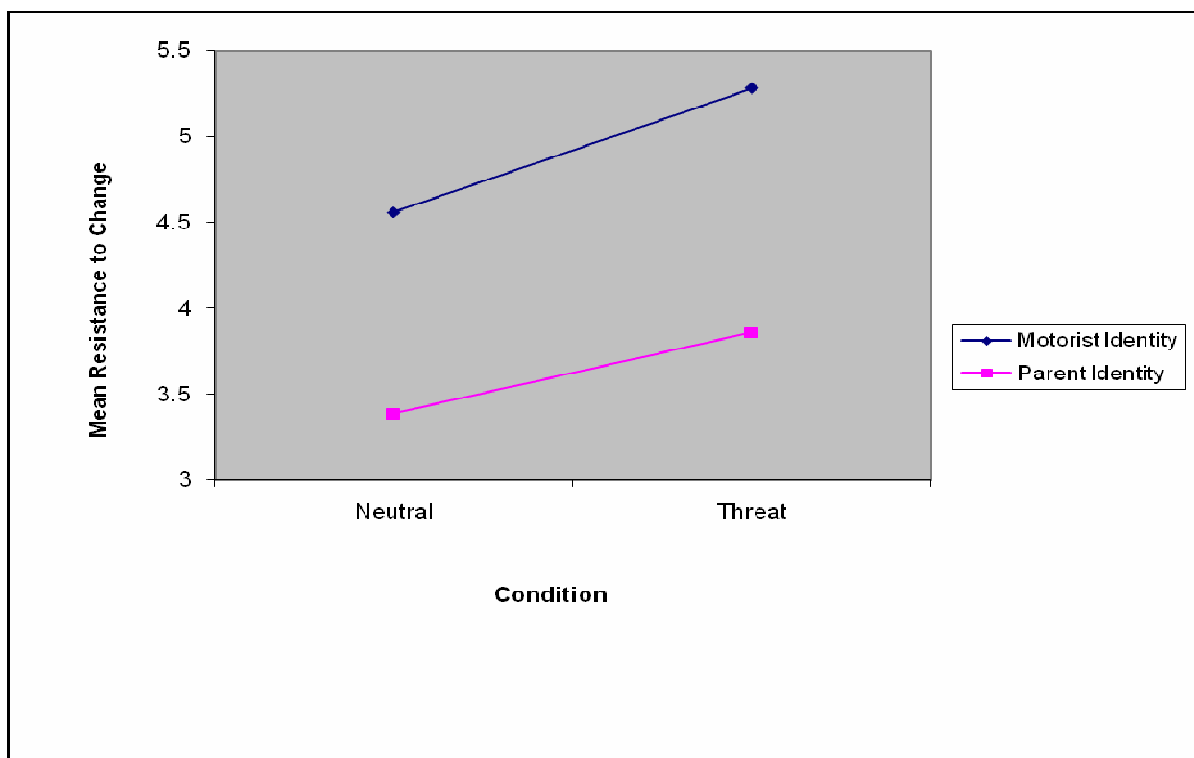

Figure 2: Mean Resistance to Change for Neutral versus Threat Condition

The ANOVA analysis demonstrated a significant difference in resistance to change between the threat and the neutral conditions. We then wanted to assess whether the threat to identity explained variance in resistance to change over and above other contributory factors. We therefore conducted a multiple regression, in which resistance to change travel behaviour was regressed onto identity threat, while

controlling for baseline intention to change travel behaviour, previous travel behaviour, trait reactance and identity centrality. Other variables (gender, positive and negative affect, baseline identity factors) were also included but were non-significant. Because identity threat was positively skewed, the variables were first transformed by taking the square root. All variables were entered simultaneously. Identity centrality and identity salience demonstrated multicollinearity (Condition Index = 43, Variance Proportions for both = .62, exceeding the thresholds of 30 and .5 respectively, Tabachnik & Fidell, 2001). Only identity centrality was used in the final regression, presented in Table 4: the regressions were also run with identity salience and the results followed the same pattern. Table 4 presents the regression results.

	All (N=295)	Motorist Subgroup (N=146)	Parent Subgroup (N=149)
Age	.13**	.10	-.01
Baseline intention to change	-.21***	-.37***	-.01
Previous behaviour:			
Walk	-.28**	-.21**	-.23**
Cycle	.06	.06	.11
Bus	-.08	-.18*	.07
Train	0.2	.04	-.07
Trait reactance	.12*	-.20	.19*
Identity centrality	-.10*	.16*	-.25**
Identity threat	.26***	.24**	.17*
Adj. R2	.35	.45	.16
	$F_{(12,277)}=13.73$***	$F_{(12,132)}=10.91$***	$F_{(12,132)}=3.32$***

Table 4: Regression of Resistance to Change onto Identity Threat and Control *Variables (β Values)*

*** $p<.001$, ** $p<.01$, * $p<.05$

The regressions supported Hypotheses 2 and 3: identity threat contributed to resistance to change travel behaviour over and above trait psychological reactance and previous or habitual travel mode choice, and this held for both a transport-related identity (motorist) and a social identity (parent). As expected, trait reactance and previous travel mode, specifically walking, also contributed significantly. Of note is that trait reactance became non-significant in the motorist subgroup where baseline intention to change was the strongest predictor. For parents, baseline intention to change did not relate to resistance but trait reactance was significant. Of particular interest was the difference in direction of the relationship between identity centrality and resistance to change for threat to motorist and parent identities. For threat to a motorist identity, the more central the identity as a motorist, the less likely was intention to change. For threats to a parent identity, the more central the parent identity, the more likely was intention to change travel behaviour. A final test was conducted to examine whether the coefficients for identity threat in each group differed significantly: using the test recommended by Clogg, Petkova and Haritou (1995) and Paternoster, Brame, Mazerolle and Piquero(1998), the coefficients did not differ significantly.

4. Discussion

The study asked 300 working adults in England, with access to private cars and public transport, to indicate their intention to change travel behaviour in response to eight transport-related vignettes. Half of the sample was presented with vignettes targeting a motorist identity, and half with vignettes targeting a parent identity. In each set of eight, four vignettes were designed to threaten the target identity and four were designed as neutral. Analysis of variance showed that resistance to change was greater in the threat vignettes, for both subgroups. Regression analyses demonstrated that self-identity threat predicted resistance to change, beyond the predictive power of previous travel behaviour and trait psychological reactance. The relationship between threat to identity and resistance to change was significant both for a transport-related identity (motorist) as well as a social identity (parent).

The findings suggested several factors contributing to resistance to change. Age had a positive relationship with resistance, that is, older participants were less likely to indicate an intention to change. Previous travel behaviour involving walking, and potentially also using a bus, was negatively related to resistance, that is, people who often walked were more likely to consider reducing their car usage in response to identity threat. This could imply that early stages of encouraging more sustainable travel may be crucial: if people can be persuaded to walk even sometimes, they may then be less resistant to further change. Previous intention to change was significantly and negatively related to resistance, and this speaks to the transtheoretical model of behaviour change (Prochaska, DiClemente, & Norcross, 1992), which posits that a stage of contemplation of change is necessary for subsequent successful change. The relationship between identity centrality and resistance to change differed in direction between participants who received a threat to a motorist identity versus a threat to a parent identity. This suggests that threats to different identities may trigger different responses. The finding that centrality of the parent identity was negatively related to resistance to change, that is, a threat to a more central identity may *reduce* the likelihood of resistance, raises the possibility that threats to central, social identities may be more successful at encouraging change. This potentially important implication in attempting to change individual behaviour towards sustainability merits further research: is the critical factor centrality of identity or threat to a social identity? Can the same effect be found for other central, social identities, identities relating to religion, ethnicity or community membership, for example?

The findings here add to a number of previous studies which have linked identity and behaviour. Behaviours of relevance to sustainability, including recycling (Mannetti, Pierro, & Livi, 2004; Nigbur, Lyons, & Uzzell, 2010), green consumerism (Sparks & Shepherd, 1992) and travel mode (Murtagh et al., under review), have been shown to be influenced by conceptions of identity. The evidence here speaks to the relationship between behaviours and the self-concept, and more generally, to the complexity of influences on behaviour. Behaviour is best thought of as an outcome of a complex web of factors. Instrumental or 'rational' factors play a role but so too do

affective and symbolic factors (Steg, 2001) including identity, and policy and attempts to change behaviour need to address this complexity.

The finding that identity threat was related to resistance to change for both motorist and parent identities has important theoretical and policy implications. At a theoretical level, this offers empirical evidence for identities beyond the social: the results suggest that, in addition to accepted social identities relating to gender, ethnicity or role (Stryker, 1987), for example, individuals may manage practice-related identities. That is, amongst the multiplicity of identities maintained by an individual, some identities may derive from typical or regular activities. Previous work on transport referred to transport-related identities including motorist, public-transport user, pedestrian (Mann & Abraham, 2006) and bicyclist (Gatersleben & Haddad, 2009). Further studies linked identity to blood donation (Callero, 1985), eating (Oyserman, et al., 2007) and economic consumption (Sparks & Shepherd, 1992). Building on this research, the current study further supported a transport-related identity of 'motorist'. If identities may be practice-related, this suggests the need to extend identity theories to consider to what extent 'we are what we do'.

For future research and to inform policy, the current study suggests the importance of exploring practice-related identities, such as hobbyist, holiday maker or householder. Can these identities be linked to sustainable behaviours? Are threats to these identities contributing to resistance to change in associated domains? Some earlier studies appeared to link specific values to identities, for example the "healthy eater" (Armitage & Conner, 1999; Sparks, Shepherd, Wieringa, & Zimmermanns, 1995) and the "green consumer" (Sparks & Shepherd, 1992) and this may point to ways in which identities could be used constructively to change behaviour. For instance, identities which may encourage sustainable behaviours - the green commuter, the energy-efficient motorist, the frugal householder - could be promulgated. In addition, research could explore how non-preferred practices, such as the reluctant motorist, are managed.

The current research was necessarily limited in focus, in order to test specific hypotheses. A major limitation was the necessity to, in part, de-contextualise the identities investigated. However, identities develop and are maintained within social and structural contexts (Christie, 2010) and further research is needed to explore how contexts influence the experience of identity threat. Building from this study as a first step in understanding the role of identity in resistance to change, further studies should explore how threat could elicit other coping strategies. In particular, Identity Process Theory raises the promising potential for identity threat to *facilitate* change through acceptance strategies and this is worth exploring in future empirical work. The study described above focused primarily on singular identities. More work is needed on the implications of multiple identities. Can threat to one identity be compensated by recourse to another? Does the relative importance of identities relate to types of coping strategy? Finally, the current study was limited to participants who earned at or above the national average income. Identities and behaviours may relate to socioeconomic class or income: future research should explore if identity processes operate in a similar way across all income levels.

4.1 Wider Implications for Understanding Responses to Climate Change

If identities contribute to behaviour, then factors which influence identity may change behaviour. Our findings show that threats to identity may contribute to resistance to change behaviour, in the domain of travel. The findings support the predictions of Identity Process Theory (Breakwell, 1986), that threats to identity will trigger psychological coping strategies. The theoretical framework for the current findings permits generalisation beyond individual behaviour to typical responses to issues relating to climate change.

We have argued that deflection processes, as postulated by Identity Process Theory, may result in resistance to change. In studies looking at social reactions to climate change, people attribute their failure to change their own behaviour to cost, inconvenience, insufficient information, perceived ineffectiveness of individual action, lack of personal responsibility and distrust of climate scientists (Bickerstaff, Lorenzoni, Pidgeon, Poortinga, & Simmons, 2006; Emmert, Van de Lindt, & Luiten, 2010; Hallin, 1995; Platt & Retallack, 2009; Poortinga, Pidgeon, & Lorenzoni, 2006; Spence, et al., 2010; Stoll-Kleemann, et al., 2001). Such responses may be proposed as outcomes of coping processes, the mechanisms of which are posited by Identity Process Theory and which are now outlined.

4.2 Mechanisms of coping with threat

Individuals may reconstrue or redefine the meaning of the threat, in such a way as to defend the self against the need to change. An example of such reconstrual may be the acceptance that climate patterns are changing but attributing the cause to natural geological cycles, rather than anthropogenic sources. Individuals may re-attribute responsibility for a threatening position to an external locus of control. An example may be the attribution of primary responsibility for emissions to the Chinese, the Americans, business or the government and positioning personal actions as ineffective. Individuals may adopt a negativist strategy and actively confront the perceived source of the threat to identity. An example may be the attacks on credibility of environmental scientists. Further examples of coping strategies, with examples from common responses to the issue of climate change, could be cited. The point is that the current empirical findings linking identity threat to resistance to change, within the theoretical framework proposed by Identity Process Theory, leads logically to an understanding that many common reactions to the issues around climate change may in fact be defensive reactions, aimed at protecting the self-concept from threat. This builds on earlier arguments by Stoll-Kleeman and colleagues (2001) that environmental attitudes can be ego-defensive.

It can be suggested that climate change threatens individuals at two levels: first, the threat of climate change itself, in particular the risks incurred by changing weather patterns, and second, the requirement to change carbon-intensive behaviour. Defensive coping strategies may be prompted for both levels of threat and different strategies may be used. If, for example, strategies which admit some level of threat at the global level are combined with strategies which deflect personal responsibility or efficacy, then the individual may accept the importance of climate change but take little or no action personally. This 'value-action gap', exemplified in many studies

(Barr, 2006; Flynn et al., 2009) is thus clarified and explained in part by Identity Process Theory.

4.3 The Nature of Identity Threat
Further support for this argument is suggested in the work of Tertoolen, Van Kreveld and Verstraten (1998) who found that providing more information on the costs and environmental impacts of travel by car resulted in an increase in blaming government policies rather than behaviour change: their findings may be interpreted as the provision of information experienced as threat which then led to defensive coping strategies. Why should provision of information constitute a threat to identity?

Threats to identity are defined as contravention of the principles of operation of the self-concept, that is, contravention of the need to maintain or enhance self-esteem, self-efficacy, continuity and distinctiveness (Breakwell, 1986). It is possible to suggest ways in which campaigns and discourses aimed at encouraging more sustainable behaviours may inadvertently contravene the identity principles. Provision of information sits within such discourses. Climate change campaigns have proposed the need to change specific behaviours, such as reducing car use (Gerrard, 2010), as well as targeting behaviours more generally in arguing the need for radical change to consumerist lifestyles (Jackson, 2010). Messages demanding change are unavoidable given the urgency with which greenhouse gas emissions must be reduced (IPCC, 2007) but may threaten individuals' sense of continuity. The continuity principle necessitates a feeling of congruence between the self in the past, present and future, and any change to a practice or value held as central by the individual could undermine continuity.

This theoretical understanding poses the conundrum that *any* change could contravene the perception of continuity and yet change must happen if the escalating problems in the planet's ecological systems are to be mitigated. Challenges to lifestyles may threaten the distinctiveness principle, in addition to continuity. In the consumerist society, the choice of possessions can be a way of distinguishing oneself: to have more, and more expensive, possessions than others is seen to reflect on one's worth, as well as one's importance, status and prestige (Dittmar, 1992). Particular lifestyles are seen as aspirational, and as paths to distinction. Arguments for the need to change away from carbon-intensive lifestyles may then threaten the sense of distinctiveness not only of those living such lives, but also of those who aspire to attain distinction. A final point on how change discourses may threaten identity lies in the potential for enforced change to undermine the self-efficacy principle. The principle posits that individuals experience the need to feel competent and in control of their lives and context. Enforced change, through rule of law or modification of infrastructure, may undermine individuals' sense of self-efficacy, and may result in resistance. The chequered history of congestion charging in London is an example of how imposed change may encounter continued resistance. In summary then, the proposition of Identity Process Theory that threats to identity may result in resistance to change, supported in the current research, and that threats to identity may be understood, inter alia, as threats to continuity, distinctiveness and self-

efficacy, elucidates why attempts to change behaviour towards sustainability may in fact generate resistance.

The discussion above argues for an understanding of behaviour as complicated and multiply influenced. Fialkow and Muslin (1987) described behaviour as 'overdetermined', that is, a single form of behaviour can have many functions and meanings. Thus, in responses to questions on sustainable behaviours, 'rational' arguments for better or cheaper infrastructure, for more government intervention, or for more information, can serve many functions. We argue that, alongside the pragmatic and instrumental functions, such arguments also work to protect the self from threat. Policy recommendations then should recommend not only more information and improved infrastructure but also proposals to address threatened identities. Such proposals could include recommending discourses that acknowledge the threats to individuals and groups, threats not only by climate change itself, to environmental, social and political systems, but also threats implicit in changes to lifestyle. Discourses could emphasise the inevitability of change in human history and could harness examples of successful life change from the past, such as the Industrial Revolution, the massive changes to the class system in Britain in the first half of the twentieth century, legal equality for women. The learning points of such changes included upheaval, uncertainty and anxiety during the process but the changes brought about a better and fairer society in which the well-being of most people was enhanced. New discourses aimed at facilitating identity change could aid both mitigation of climate change through changed behaviour, and adaptation to changing ecological and social systems.

In summary, the study demonstrated that self-identity threat is related to resistance to change travel behaviour. Self-identity threat, as explicated by Identity Process Theory, triggers psychological coping strategies, and of these, deflection strategies may account for resistance to change. More generally, the processes defined in the theory can be postulated to explain common responses to the issue of climate change. Many responses can be understood as serving identity-defensive goals. With this knowledge, new policy approaches can be suggested, which address individuals' identity needs alongside instrumental factors.

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Appendix Sample Vignettes

Threat Vignette: Motorist

You are a regular car user. The government is planning an incentive scheme to be offered to drivers selected from DVLA records. A substantial sum of money will be offered, tax-free, to these drivers if they choose to stop driving by selling their car. The amount will be based on the cost of public transport in place of regular car journeys, plus a generous bonus. You would qualify if you were among the drivers selected, and you agreed to sell your car within two months and not to buy or take out a long-term lease on another car for a minimum of 2 years. You could choose the length of the contract beyond this and the payment would be scaled accordingly.

If you were among the drivers selected, how likely is it that you would volunteer to stop driving?
[6-point scale, anchored at Very unlikely and Very likely]

Threat Vignette: Parent

The council is seeking to reduce rush-hour traffic jams and blames parents for making poor decisions on school travel. It is planning a scheme under which responsibility for children's travel to and from school throughout the borough will be taken away from parents, and schools will take control. Each school will produce a travel plan for every pupil they admit and will decide how each child should travel. Most children will be required to walk or, if some distance from the school, they will be required to cycle. The school will take over getting your child from home to school in the morning and from school to home in the afternoon. The Local Authority, through the schools, will monitor your compliance.

If you were a parent in this area, how likely is it that you would intend to change your involvement in your child's journey to and from school?
[6-point scale, anchored at Very unlikely and Very likely]

Neutral Vignette

You are a regular car driver, using the car to go shopping, to the gym and to meet friends locally in the evenings and at weekends. As part of meeting its climate targets, the government is considering schemes to encourage more people to use public transport. One such scheme is the "frequent passenger". This would operate in a similar fashion to "frequent flyer" programmes. Every use of public transport would earn points for the individual. Points could be exchanged for vouchers for shopping, restaurants, theatres and attractions, or money off future journeys by tram, bus or train.

How likely is it that you would intend to take part in such a scheme?
[6-point scale, anchored at Very unlikely and Very likely]