European Journal of Social Psychology
Eur. J. Soc. Psychol. **36**, 229–237 (2006)
Published online 27 January 2006 in Wiley InterScience
(www.interscience.wiley.com). **DOI**: 10.1002/ejsp.299

The influences of intrinsic motivation on execution of social behaviour within the theory of planned behaviour

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Abstract

The present study examined the utility of two forms of measurement of intrinsic motivation in increasing the predictive validity of the theory of planned behaviour. Self-report questionnaires were administered to school pupils (n = 174), University students (n = 129) and adults (n = 157). The data were analysed using confirmatory factor analysis and regression analysis. Confirmatory analysis supported discriminant validity between Forms A and B measures of intrinsic motivation. In addition, hierarchical regression analysis demonstrated that Form B measure of intrinsic motivation increased effectiveness of the theory of planned behaviour in predicting intentions and social behaviour. Further, the regression analysis showed that age and past behaviour did not reduce the effects observed for intrinsic motivation. It is recommended that intrinsic motivation could increase the predictive utility of the theory of planned behaviour. Copyright © 2006 John Wiley & Sons, Ltd.

The theory of planned behaviour provides a useful framework for predicting and explaining social behaviour (Ajzen, 1991). According to this theory, behaviour can be best predicted from a person's intention, which is an indicator of how hard people are willing to try, and how much effort people plan to exert toward performance of behaviour (Ajzen, 1991). Intention is in turn a function of attitudes (positive or negative evaluation of performing the behaviour), subjective norm (perceived influences that significant others may exert on the execution of behaviour) and perceived behavioural control (the extent to which people believe that they can control performance of social behaviour). For Ajzen (1991), perceived behavioural control can also predict behaviour directly when behaviour is not under complete volitional control and when perceptions of control are realistic.

The theory of planned behaviour also deals with antecedents of attitudes, subjective norms and perceptions of control. The theory proposes that attitudes arise out of a combination (multiplicative function) of beliefs that the behaviour will lead to certain consequences (behavioural beliefs) and

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Received 24 March 2004
Accepted 23 February 2005

evaluations of these consequences. This relationship between behavioural beliefs and evaluations is known as the expectancy × value model and is grounded in subjective expected utility theory (Ajzen, 1991). Subjective norms and perceptions of control are also proposed to have similar origins. Subjective norms are determined by a combination of normative expectations of others (normative beliefs) and a motivation to comply with those others. Perceptions of control are determined by beliefs about the presence of factors that may facilitate or impede performance of behaviour (control beliefs) and a perceived power of these facilitative and/or constraining factors (Ajzen, 1991). Meta-analytic reviews of previous research have found that attitudes, subjective norms and perceptions of control are good predictors of intentions, and that intentions and perceptions of control predict behaviour (Hagger, Chatzisarantis, & Biddle, 2002). Nevertheless, as Ajzen (1991), and more recently Hagger et al. (2002a) noted, additional predictors should be included in the theory if it is shown that they explain a significant portion of variance in intentions or behaviour after the theory's original components have been taken into account.

The Theory of Planned Behaviour and Intrinsic Motivation

The present study considers the role of intrinsic motivation in the theory of planned behaviour. Based on self determination theory (Deci & Ryan, 1980), Hagger, Chatzisarantis, and Biddle (2002b) argued that the expectancy × value model, proposed by the theory of planned behaviour, may not be sufficient for predicting and explaining human behaviour because human judgment and behaviour are not always a function of the computational rules suggested by the expectancy × value model. Intrinsic motivation for example is a spontaneous form of motivation that arises from the fundamental needs for relatedness, competence and autonomy, and refers to: 'the doing of an activity for its *inherent satisfactions* rather than for *some separable consequences*' (Ryan & Deci, 2000, p. 56). As is apparent from this definition of intrinsic motivation, the performance of social behaviours is not always a function of expected outcomes that are operationally separable from the activity, and that people may engage in social behaviour for its own sake and for the interest and pleasure that are experienced during performance of the activity. Nevertheless, Chatzisarantis, Hagger, Biddle, and Karageorghis (2002) and Hagger et al. (2002b) did not find direct effects of intrinsic motivation on intentions and behaviour. This may be due to measurement issues.

Specifically, Chatzisarantis and Hagger et al. (2002) and Hagger et al. (2002b) used the behavioural regulation for physical activity questionnaire (Mullan, Markland, & Ingledew, 1997) to assess the motives of enjoyment and interest as indicators of intrinsic motivation (e.g. I exercise because I enjoy physical activity). We use the term Form A to describe this measure of intrinsic motivation. It could be said that direct measures of enjoyment are not satisfactory indicators of intrinsic motivation. This is because the measure could elicit responses made on the basis of outcome expectancies. As Deci, Koestner, and Ryan (1999) suggested, such measures will encompass both intrinsic and extrinsic components of motivation. Unfortunately, the behavioural regulation questionnaire used by Chatzisarantis and Hagger et al. (2002) and Hagger et al. (2002b) does not prevent people from using outcome expectancies as a basis for answering questions about intrinsic motivation. For example, people may report that physical activity is enjoyable because they expect to obtain positive outcomes, which is an expression of an expectation to obtain an outcome that is separable from the activity itself, i.e. it is not intrinsic to the activity.

In response to such concerns, the current study used a form of measurement of intrinsic motivation (Form B) that attempted to remove the influences of outcome expectancies from appraisals of intrinsic motivation. As recommended by Deci et al. (1999), Form B required participants to indicate their intrinsic motivation with respect to a hypothetical scenario describing a situation in which they had

achieved all salient behavioural outcomes. It was expected that the hypothetical scenario describing successful attainment of behavioural outcomes would prevent people from appraising intrinsic motivation on the basis of outcome expectancies; thus, providing more accurate estimates of intrinsic motivation.

The present study tested three hypotheses. In accordance with the view that only the Form B measure of intrinsic motivation prevents people from using outcome expectancies as a basis for answering questions about intrinsic motivation, it was hypothesized that Forms A and B would elicit a distinct pattern of responses to queries of intrinsic motivation, and therefore that Forms A and B would display discriminant validity (H_1). The second aim of the present study was to examine the influences of intrinsic motivation on intentions and behaviour within the theory of planned behaviour. Based on self determination theory (Deci & Ryan, 1980), it was hypothesised that only the Form B measure of intrinsic motivation would contribute to the prediction of intentions and of social behaviour over and above the components of the theory of planned behaviour (H_2).

In addition, we examined moderating effects of both measures of intrinsic motivation (Forms A and B) on the relationships between variables in the theory of planned behaviour and physical activity. Whilst we explored all possible moderating effects of intrinsic motivation, we expected moderation only for the effect of the Form B measure of intrinsic motivation on the intention–behaviour relationship. Deci and Ryan (1980) proposed that performance of intrinsically motivated behaviour depends more on environmental cues relevant to initiation of intrinsically motivated activity than on explicit judgments about behaviour and intentions. Therefore, when behaviour is intrinsically motivated, the effect of intentions on behaviour should diminish because attention to intended action decreases (H_3). Finally, we included measures of past behaviour in order to rule out the alternative hypothesis that the Form B measure of intrinsic motivation is simply a proxy measure of past behaviour.

METHOD

Research Participants and Procedure

Four hundred and sixty participants including school pupils ($n = 174$, male = 71, female = 103, mean age = 14.25 years, $SD = 1.04$), University students ($n = 129$, male = 56, female = 73, mean age = 19.52 years, $SD = 1.44$), and adults ($n = 157$, male = 79, female = 78, mean age = 34.33, $SD = 1.14$) completed multi-item measures of intentions, attitudes, subjective norms, perceptions of control, and two measures of intrinsic motivation (Forms A and B).

Intentions were measured with three items (Ajzen, 1991). An example item is: 'I intend to do active sports and/or vigorous physical activities, for at least 30 minutes, three days per week, over the next five weeks, during my leisure time' rated on a 7-point scale anchored by 'strongly agree' (7) to 'strongly disagree' (1). Another example is: 'I intend to do active sports and/or vigorous physical activities, for at least 30 minutes, over the next five weeks, during my leisure time with the following regularity 'not at all' (1) to 'every day' (7). Cronbach's alpha for the intention measure was 0.93.

Subjective norm was measured with two items on a 7-point scale, ranging from 'strongly disagree' (1) to 'strongly agree' (7). An example is: 'Most people who are important to me think that I should do active sports and/or vigorous physical activities for at least 30 minutes, three days per week, over the next five weeks, during my leisure time.' The subjective norm measure had a modest level of reliability ($\alpha = 0.66$). Attitude towards physical activity was assessed, on 7-point scales, with three bipolar adjectives that reflected moral (bad/good), instrumental (useful/useless), and affective evaluations

(boring/interesting). Cronbach's alpha reliability for the attitude scale was satisfactory ($\alpha = 0.74$). Perceived behavioural control was assessed with three items on 7-point scales (Ajzen, 1991). An example is: 'How much control do you believe you have over doing active sports and/or vigorous physical activities for at least 30 minutes, three days per week, over the next five weeks, during your leisure time' on a scale ranging from 'no control' (1) to 'complete control' (7). The measure of perceived control had a satisfactory alpha coefficient ($\alpha = 0.74$).

The Form A measure of intrinsic motivation comprised four items (e.g. I exercise because it is fun; Mullen et al., 1997). Responses to these items were recorded on 7-point scales ranging from 'not true for me' (1) to 'very true for me' (7). The alpha coefficient for this scale was 0.91. The Form B measure of intrinsic motivation was assessed by, first, asking participants to list advantages of performing physical activity over the next five weeks.[1] Immediately afterwards, participants were asked to imagine that they had already achieved all these behavioural advantages and to report the extent to which they would decide to continue engaging in physical activities for enjoyment, interest, and fun. Responses to items were recorded on 7-point scales ranging from 'not true for me' (1) to 'very true for me' (7). The Form B measure of intrinsic motivation had a satisfactory level of reliability ($\alpha = 0.73$).

Past behaviour was assessed on a 6-point scale, ranging from (1) 'not at all' to (6) 'most of the days per week' (Bagozzi & Kimmel, 1995). Participants were asked to report how often they had engaged in active sports, and/or vigorous physical activities for at least 30 minutes during their leisure time, over the last five weeks.

After five weeks, participation in physical activity during leisure-time was measured using Godin and Shephard's (1985) Leisure-Time Exercise Questionnaire. The instrument contains three open-ended questions designed to assess the frequency of mild, moderate, and vigorous physical activity. The attrition rate from Time 1 to Time 2 was 10.65% ($n = 49$, male = 26, female = 23, mean age = 28.36, $SD = 3.98$). The measures of behaviour corresponded with the measures of the components of the theory of planned behaviour in terms of action and target (active sports and/or vigorous physical activities), context (during leisure time) and time (over the next five weeks). However, the Forms A and B measures of intrinsic motivation did not correspond to the measures of behaviour in terms of time and target but they did in terms of action (physical activity) and context (leisure time).

RESULTS

Confirmatory Factor Analysis and Descriptive Statistics

A confirmatory factor analysis was conducted to test the hypothesis (H_1) that the two measures of intrinsic motivation would display discriminant validity (Mulaik & Millsap, 2000). As shown in Table 1, Model 2, a model that assumed discriminant validity because it let indicators of the two measures (Forms A and B) load on two different factors (Mulaik & Millsap, 2000), exceeded the criteria indicative of good fit. Specifically, the comparative fit index (CFI) of Model 2 was greater than 0.95 whereas the standardised root mean square residual (SRMSR) was lower than 0.08 (Hu & Bentler, 1999). In contrast, Model 1, a congeneric model that assumed a lack of discriminant validity because it forced the indicators of the two measures to load on the same factor, did not exceed criteria of good fit. Further, model comparisons revealed that Model 2 had a better fit than Model 1 because the

[1]A content analysis of behavioural advantages revealed a total of 23 belief categories. The five modal salient categories were: improve fitness, which was endorsed by 18.5% of the sample, improve and learn new skills endorsed by 12.8% of the sample, lose weight which was endorsed by 12.8% of the sample, stay healthy endorsed by 10% of the sample, and meet new people endorsed by 8.5% of the sample.

Table 1. Fit indexes of confirmatory models of intrinsic motivation

	χ^2 (df)	CFI	SRMSR	AIC
Model 1: 1-factor congeneric model	53.02 (14)	0.93	0.05	25.02
Model 2: 2-factor model	24.49 (13)	0.97	0.04	−1.51

Akaike's Information Criterion (AIC; Akaike, 1987) in Model 2 was much lower than the AIC of Model 1 (Rigdon, 1999). In addition, a Freedman's test of ranked residuals showed that Model 2 had a statistically significant lower residual variance than Model 1 (χ^2 (1) = 5.00, $p < 0.05$) (Rigdon, 1999). These results suggest that the two measures of intrinsic motivation display discriminant validity.

A one-way multivariate analysis of variance revealed that participants who completed questionnaires at both waves of data collection did not differ from those who did not complete all questionnaires on attitude, perceptions of control, subjective norm, intention, past behaviour, and intrinsic motivation (Forms A and B; $F = 1.77$, $p > 0.05$). Correlation coefficients indicated that intention was correlated with the Form A ($r = 0.30$, $p < 0.05$) and Form B ($r = 0.40$, $p < 0.05$) measures of intrinsic motivation, attitude ($r = 0.56$, $p < 0.05$), perceived control ($r = 0.37$, $p < 0.5$), and subjective norm ($r = 0.09$, $p < 0.05$). Intention ($r = 0.56$, $p < 0.05$), past behaviour ($r = 0.52$, $p < 0.05$) perceptions of control ($r = 0.14$, $p < 0.05$), Form A ($r = 0.37$, $p < 0.05$), and Form B ($r = 0.37$, $p < 0.05$) of intrinsic motivation were associated with physical activity participation. Finally, the mean score of the measure of past behaviour was 4.45 with a standard deviation of 3.07.

Prediction of Intentions and Behaviour

The first step of a hierarchical regression analysis that examined effectiveness of intrinsic motivation in predicting physical activity showed age to predict physical activity participation ($F = 23.41$, $p < 0.05$). In the second step of analysis, intentions ($\Delta F = 86.55$, $p < 0.05$) but not perceived behavioural control predicted physical activity participation. In the third step of the analysis, attitudes and subjective norms did not contribute to the prediction of physical activity ($\Delta F = 2.93$, $p > 0.05$), but in the fourth step of the analysis, the two measures of intrinsic motivation did add significantly to the prediction of physical activity ($\Delta F = 4.49$, $p < 0.05$). Consistent with Hypothesis 2, only the Form B measure of intrinsic motivation significantly predicted physical activity. Contrary to Hypothesis 3, the fifth step of analysis showed that neither Form A or Form B measure of intrinsic motivation moderated the effects of intention on physical activity ($\Delta F = 0.31$, $p > 0.05$). Finally, in the sixth step of analysis, past behaviour contributed to the prediction of physical activity behaviour ($\Delta F = 18.43$, $p < 0.05$). Interestingly, the effects of Form B measure of intrinsic motivation on physical activity remained significant once the effects of past behaviour were taken into account (see Table 2).

A hierarchical regression analysis predicting intentions showed that age did not predict (in the first step of analysis) intention ($F = 3.22$, $p > 0.05$). In the second step, attitudes, subjective norms, and perceived control added significantly to the prediction of intentions ($\Delta F = 102.04$, $p < 0.05$). Consistent with Hypothesis 2, the third step of the analysis revealed that only Form B measure of intrinsic motivation predicted intention ($\Delta F = 6.20$, $p < 0.05$). In addition, the fourth step of analysis showed that past behaviour predicted intention ($\Delta F = 248.37$, $p < 0.05$) but that, even after control of past behaviour, the effects of Form B measure of intrinsic motivation were significant (see Table 3).[2]

[2]Additional hierarchical regression analyses in which the intention item that was measured on a continuous-closed scale (e.g. I intend to do active sports and/or vigorous physical activities, for at least 30 minutes, during my leisure time, over the next five weeks with the following regularity) was not included as an indicator of intention revealed effects of Form B but not of Form A of intrinsic motivation on intentions ($\Delta F = 4.91$, $p < 0.05$) and behaviour ($\Delta F = 5.39$, $p < 0.05$).

Table 2. Prediction of physical activity participation

	β	t	R^2
Step 1 Age	−0.23	−4.84*	0.05*
Step 2 Age	−0.18	−4.41*	
Intention	0.53	12.53*	
Perceived control	−0.01	−0.29	0.32*
Step 3 Age	−0.18	−4.40*	
Intention	0.47	9.32*	
Perceived control	−0.01	−0.30	
Attitude	0.10	2.11*	
Subjective norm	0.05	1.11	0.33
Step 4 Age	−0.14	−2.93*	
Intention	0.44	8.76*	
Perceived control	0.00	−0.07	
Attitude	0.03	0.56	
Subjective norm	0.05	1.14	
Form A intrinsic motivation	0.07	1.15	
Form B intrinsic motivation	0.16	2.04*	0.35*
Step 5 Age	−0.15	−2.94*	
Intention	0.51	4.80*	
Perceived control	−0.01	−0.13	
Attitude	0.03	0.56	
Subjective norm	0.05	1.15	
Form A intrinsic motivation	0.06	1.11	
Form B intrinsic motivation	0.16	2.10*	
Form A intrinsic motivation × intention	−0.07	−0.73	
Form B intrinsic motivation × intention	0.03	0.62	0.35
Step 6 Age	−0.14	−2.84*	
Intention	0.36	3.27*	
Perceived control	−0.01	−0.34	
Attitude	0.02	0.33	
Subjective norm	0.04	1.01	
Form A intrinsic motivation	0.06	0.98	
Form B intrinsic motivation	0.14	2.32*	
Form A intrinsic motivation × intention	−0.09	−0.87	
Form B intrinsic motivation × intention	0.03	0.68	
Past behaviour	0.24	4.29*	0.37*

Note: Parameters with an asterisk are statistically significant at $\alpha < 0.05$.

We also conducted two additional regression analyses in which the effects of age were not considered. Results showed that Form B ($\beta = 0.14$, $p < 0.05$) but not Form A ($\beta = 0.10$, $p > 0.05$) measure of intrinsic motivation contributed to the prediction of physical activity participation ($\Delta F = 0.13.59$, $p < 0.05$). Similarly, Form B ($\beta = 0.21$, $p < 0.05$) but not Form A ($\beta = 0.08$, $p > 0.05$) measure predicted intention ($\Delta F = 20.96$, $p < 0.05$), over and above the variables of the theory of planned behaviour. Additional hierarchical regression analyses that controlled for the effects of the three separate attitude items (affective, instrumental and moral items) showed that Form B ($\beta = 0.16$, $p < 0.05$), but not Form A ($\beta = 0.06$, $p > 0.05$) predicted physical activity ($\Delta F = 7.32$, $p < 0.05$). Similarly, regression analysis predicting intention revealed that Form B ($\beta = 0.21$, $p < 0.05$) but not Form A ($\beta = 0.00$, $p > 0.05$) measure predicted intention after control of the three separate attitude items ($\Delta F = 13.45$, $p < 0.05$). Further, analyses in which Form B on its own (without Form A) was added to the regression analysis revealed a significant contribution of Form B measure in the prediction of both physical activity behaviour ($\Delta F = 7.77$, $p < 0.05$) and intention ($\Delta F = 12.46$, $p < 0.05$).

Table 3. Prediction of physical activity intention

	β	t	R^2
Step 1 Age	−0.08	−1.79	0.01
Step 2 Age	−0.16	−4.27*	
Attitude	0.50	13.82*	
Subjective norm	0.03	0.78	
Perceived behavioural control	0.27	7.48*	0.38*
Step 3 Age	−0.13	−2.82*	
Attitude	0.42	10.08*	
Subjective norm	0.03	0.80	
Perceived behavioural control	0.28	7.62*	
Intrinsic motivation (Form A)	0.03	0.61	
Intrinsic motivation (Form B)	0.23	2.78*	0.40*
Step 4 Age	−0.09	−2.41*	
Attitude	0.25	6.90*	
Subjective norm	0.02	0.75	
Perceived behavioural control	0.16	5.25*	
Intrinsic motivation (Form A)	−0.01	−0.19	
Intrinsic motivation (Form B)	0.19	2.90*	
Past behaviour	0.51	15.76*	0.60*

Note: Parameters with an asterisk are statistically significant at $\alpha < 0.05$.

Moderating Effects

Finally, we conducted hierarchical regression analyses to test all possible moderating effects of the two measures of intrinsic motivation on intentions and behaviour. In accordance with Aiken and West's (1991) recommendations, all variables were centred in order to avoid multicollinearity. In the analysis in which these additional moderator effects were included in a final step, neither Form A ($F = 0.61$, $p > 0.05$) nor Form B measure of intrinsic motivation ($F = 0.72$, $p > 0.05$) interacted with attitude, subjective norm, perceived behavioural control or past behaviour to predict physical activity intentions. Further, past behaviour did not interact with either Form A or Form B in predicting physical activity behaviour ($F = 0.39$, $p > 0.05$). Therefore, it can be concluded that the effects of intrinsic motivation on physical activity are additive rather than interactive.

DISCUSSION

The current study examined the role that intrinsic motivation plays within the theory of planned behaviour by utilising a measure of intrinsic motivation that prevented respondents from considering outcome expectancies as a basis for responding to the questions. One clear conclusion to emerge from the confirmatory factor analysis is that this measure of intrinsic motivation elicited a different pattern of responses to a more traditional measure. This result is important because it suggests that the two measures assessed distinct constructs and hence displayed discriminant validity (H_1). In this regard, a unique contribution of the present study is the development of a new measure for assessing intrinsic motivation.

Consistent with expectations (H_2), the present study revealed that Form B but not Form A measure of intrinsic motivation predicted intentions and behaviour, and that the effects of Form B of measurement of intrinsic motivation held even after control of the effects of past behaviour and

age. Presumably the effects of Form B measure can be attributed to the fact that, unlike direct measures of intrinsic motivation (Chatzisarantis et al., 2002; Hagger et al., 2002b; Mullan et al., 1997), it *analytically brackets* considerations related to outcome expectancies in an effort to restrict participants from using these expectancies as a basis for answering questions about intrinsic motivation.

Deci and Ryan (1980) suggested that when behaviour has been performed repeatedly in the past, the effect of intention on behaviour should be diminished, whereas the direct effect of intrinsic motivation to behaviour should be strengthened. This is because repeated performance of behaviour decreases attention to intended action, thus allowing intention to be usurped by automatically-suggested or habitual intrinsically motivated responses associated with environmental conditions. In contrast, when behaviour has not been performed repeatedly in the past, performance of intrinsically motivated behaviour is expected to depend on intentions (Deci & Ryan, 1980). In contrast to this thinking, the present study did not find evidence of an interaction between past behaviour and intrinsic motivation and hence there was no support for the proposed mechanisms involving habit and intrinsic motivation on intention and behaviour. Overall, although the present findings indicate a role for intrinsic motivation in the prediction of intention and behaviour, they do not delineate the conditions under which effects from intrinsic motivation are most likely.

Another limitation of the present study concerns the operationalisation of subjective norm and attitude. The present study did not include a measure of behavioural norm, and the affective aspects of the attitude construct may not be fully captured by a single item. However, previous research has shown that behavioural norms do not always exert main effects on intentions over and above subjective norm (Baker, Little, & Brownell, 2003; Conner & McMillan, 1999) and that more comprehensive measures of attitudes do not always improve the prediction of intention over a unidimensional operationalisation of attitudes (Ajzen, 1991). In addition, it can be argued that our measure of past behaviour would have helped to control for the effects of omitted variables (Ajzen, 2002).

Finally, it would be remiss of us not to acknowledge the fact that the present study tested the effects of intrinsic motivation in one behavioural domain only. The construct of intrinsic motivation should help to explain voluntary behaviours in other domains such as ecological behaviours, altruistic behaviours, and charitable acts (i.e. blood donation). This is because charitable acts and altruistic behaviours may not only be a function of the computational processes implied by the expectancy $\times$ value model, given that these types of behaviour do not bring immediate benefits to people. In contrast, the concept of intrinsic motivation may be relevant to the understanding of altruistic behaviours because it implies that people perform such social acts for their own sake, and not for the immediate benefits that might be accrued through performance of the behaviour.

In conclusion, the unique contribution of the present study is the development of a new measure of intrinsic motivation that has been found to have significant effects within the theory of planned behaviour. Importantly, the present study is the first to report effects of intrinsic motivation on intention and physical activity. In sum, these findings indicate that a consideration of intrinsic motivation improves the predictive efficacy of the theory of planned behaviour, at least in the context of physical activity. The challenge for future research will be to identify the behavioural contexts to which this finding generalises.

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