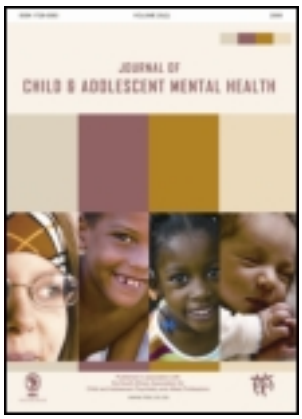

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Predictors of non-condom use intentions by university students in Britain and Greece: The impact of attitudes, time perspective, relationship status, and habit

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Research Paper

Predictors of non-condom use intentions by university students in Britain and Greece: The impact of attitudes, time perspective, relationship status, and habit

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***Objective*: This study investigated the impact of socio-cognitive factors (attitudes and norms), time perspective (TP), relationship status (RS), and past sexual behaviour on intended non-condom use in 104 Greek and 93 British university undergraduates.**
***Method*: Data were obtained by a self-report questionnaire. Data analysis included correlation, regression and ANOVA procedures.**
***Results*: Attitudes were the strongest predictors of non-condom use intentions for participants who had casual relationships or were single (i.e. unstable relationship context), and past behaviour was the strongest predictor of non-condom use intentions for those who perceived themselves to be in an exclusive relationship (i.e. stable relationship context). Past behaviour was the strongest predictor of intended non-condom use in relation to all the variables of this study. TP managed to predict non-condom use intentions and moderate the attitudes-intentions relationship. In terms of temporal influences, participants high in fatalistic TP were strongly inclined not to use condoms, irrespective of their attitudes, but TP did not differ as a function of culture.**
***Conclusions*: Our data revealed the value of considering the combined effects of relationship status, habit and attitudes, when investigating undergraduate non-condom use intentions and designing interventions. The construct of TP was introduced as a meaningful addition to sexual risk research.**

Introduction

Sexually transmitted infections (STIs) including acquired immunodeficiency syndrome (AIDS) are a worldwide health problem affecting physical and psychological well-being (WHO 2010). In 2009, 31 000 new HIV infections were reported for adults and children in Western and Central Europe, with heterosexual contact being the predominant mode of transmission (UNAIDS 2010). University students are at risk for contracting STIs, as they have been found to use condoms inconsistently (Katz, Fromme and D'Amico 2000, Kiene and Barta 2006), highlighting the need to study factors that influence unsafe sex in this older adolescent population. It has been estimated that between 6% and 43% of the university population will contract at least one STI, depending on the sample, location and year (Scandell *et al.* 2003). Abstinence aside, the only way to avoid STIs and ensure sexual health is the correct and consistent use of condoms for vaginal, anal and oral sex. Thus, empirically clarifying determinants of non-condom use is an important precursor towards safe-sex promotion.

Determinants of non-condom use have been primarily investigated through theories that emphasise the cognitive functioning of the individual, including the socialisation processes that contribute to this functioning. These theories are collectively labelled "theories of social cognition"

or "socio-cognitive theories" and are rooted in expectancy utility theories (von Neumann and Morgenstern 1947, Savage 1954). Expectancy utility models argue that people logically and subjectively weigh the pros and cons of their behaviours as well as the outcomes, and eventually choose those that will result in most benefits. Of the socio-cognitive models, the Theory of Reasoned Action (Ajzen and Fishbein 1977) has been extensively and successfully applied to the study of sexual risk in young people (e.g. Chan and Fishbein 1993, Schaalma, Kok and Peters 1993, Bosompra 2001, Chitamun and Finchilescu 2003, Gillmore *et al*. 2002). The Theory of Reasoned Action (TRA) postulates that the principal cause of behaviour is the individual's intention to engage in it. Intentions are determined by attitudes (approval or disapproval of the behaviour) and subjective norms (beliefs about whether significant others approve/disapprove of the behaviour). Within this well-known theoretical framework, attitudes and norms mediate peoples' intentions, and intentions are closely equated to actions. Criticisms of the TRA, and of the other models based on subjective utility assumptions, have been largely centred around the emphasis they place on the rational, cognitive, premeditated aspect of human functioning, whilst downplaying other constructs (e.g. non-conscious, contextual, habitual) which have been found to influence risk-taking (Sheppard, Hartwick and Warshaw 1998, Eaton Flisher and Aarø 2003). The intention-behaviour gap phenomenon (behaviour as being inconsistent with intentions) has also been cited as a weakness of the model, especially with regard to behaviours requiring cooperation, such as condom use (Kashima, Gallois and McCamish 1993, Moore and Parker-Halford 1999). Given that the aim of safe-sex interventions is translating intentions into actual behaviour, investigators have sought for variables enabling behaviour initiation, in accordance with the TRA conceptualisation. For example, the development of the TRA by Ajzen (1985) who extended the model to the Theory of Planned Behaviour (TPB) by including the construct of perceived behavioural control (PBC), that is the subjective perception of the ease of difficulty of performing a behaviour. Although the addition of PBC is assumed (Ajzen 1991) to enhance the predictive ability of the TRA and potentially bridge the intention-behaviour gap, some studies, and especially meta-analytic reviews of condom use, failed to show this added benefit (e.g. Sheeran, Abraham and Orbell 1999, Albarracín *et al*. 2001). More importantly, findings have revealed that PBC significantly predicts condom use when "confounded" (combined) with self-efficacy, that is, one's confidence in performing the behaviour (Bennett and Bozionelos 2000, Armitage and Conner 2001). Furthermore, the pilot phase of the current study revealed that measures of PBC did not add to the TRA, unless combined with self-efficacy.

One variable that has not been previously used to study condom use in conjunction with the TRA, but we expect that it has the potential to augment the model's predictive ability, is time perspective. Time perspective (TP) can be defined as "the subjective conception of focusing on various temporal categories or time frames when making decisions and taking action" (Boniwell and Zimbardo 2003:129). Time perspectives are cognitive, abstract and non-conscious temporal frames used in encoding, storing and retrieving past events, as well as forming future intentions and goals. TPs are past, present and future categories, which vary as a function of individual learned preferences and of the situation at hand. A personal preference towards one type of TP develops from birth, where people learn how to react to environmental stimuli and how to attain personal goals. Specifically, some people learn to rely on the immediate, salient aspects of the stimulus and the social setting and thus develop a preference or bias for a present orientation. Others learn to anticipate rewards of imagined future scenarios, developing thus a future orientation, whilst others learn to rely on previous experiences, developing a past orientation. Apart from immediate environmental, and possibly temperamental, influences, preference for developing one type of TP is shaped by cultural, educational, religious and socio-economic factors (Boyd and Zimbardo 2008). TPs have been found to exert a dynamic influence on judgement, decision and actions, but because the operation of TP is so fundamental and pervasive, people are seldom aware of its powers (Zimbardo and Boyd 1999).

With regard to risk-taking decisions, studies have linked a present TP to tobacco, alcohol and drug use (Keough, Zimbardo and Boyd 1999, Apostolidis *et al*. 2006), and to risky driving (Zimbardo, Keough and Boyd 1997). People who emphasised on the "here and now" (i.e. a present TP) were more likely to engage in substance use and risky driving, as compared to those who relied on cost/benefit estimation of options (i.e. future TP). Similarly, sexual risk-taking

has been linked to a present orientation, and specifically, to the hedonistic aspect of it (enjoying immediate pleasure, avoiding conflict) or the fatalistic aspect of it (lack of control over the sexual encounter, pessimistic outlook on life). Behaviours necessary for safe-sex are inherently future oriented: people need to make plans to buy condoms, negotiate their use, envision situations that might lead to intercourse and, in general, be prepared. Rothspan and Read (1996) found that university students high in future TP were more likely to adopt safer-sex behaviours (i.e. delaying the onset of sexual activity, having fewer sexual partners), as compared to those high in present TP, but no significant associations were obtained for condom use. Hutton *et al*. (1999) found that future-oriented female prisoners took fewer sexual risks (i.e. had fewer sexual partners, were less likely to combine substance use with intercourse), than the present-oriented female prisoners. Although in psychology, neither the study nor the measurement of people's temporal orientation is a new enterprise (e.g. Janet 1928, Lewin 1951, Fraisse 1964, Cottle 1976, Bond and Feather 1998, Rappaport 1990, Zuckerman 1990), we view Zimbardo and colleagues' conceptualisation, and the Zimbardo Time Perspective Inventory (ZTPI: Gonzalez and Zimbardo 1985, Zimbardo and Boyd 1999) as the best to date. The ZTPI takes into account the motivational, emotional, cognitive and social aspects of TP by using an inventory of temporally marked propositions relating to beliefs, values and preferences that individuals associate with their experiences. Five factors (i.e. time perspectives) underlie the ZTPI: past-negative, past-positive, present-hedonistic, present-fatalistic and future. The ZTPI is the outcome of interviews, focus groups, repeated factor analyses, discriminant validity analyses, item analyses and revisions, and has demonstrated high test-rest reliability indices, typically ranging from 0.70 to 0.80 for the different factors (Boniwell and Zimbardo 2003). The experience of being brought up in a certain culture influences the development of one's TP (Hall and Hall 1990, Myers 2000, Boyd and Zimbardo 2008). For example, people living in cultures with a more individualistic focus tend to be more future-oriented than those that that live in cultures that emphasise collectivism. Within countries, people living in south regions tend to be more present-oriented than those living in the north. Protestant societies tend to be more future-oriented than Catholic; the gross national product index is typically higher in Protestant societies (Boniwell and Zimbardo 2003). In everyday activities, cultural variations in TPs are reflected in walking speed, sense of urgency, the need to be punctual, the need to wear a watch and keeping the watch accurate, and so forth.

Even though attitudes, subjective norms and time perspective are largely shaped by processes of socialisation as experienced in a particular culture, these are, essentially, internal, cognitive, individual-differences variables. Research has shown that cognitive variables are necessary determinants of all human behaviour, including condom use, but cognitive variables do not provide a comprehensive explanation of behaviour. Of particular importance in the consideration of intended condom use are the factors of relationship status and past behaviour (Sheeran and Orbell 2000). Relationship status (RS) refers to the type of sexual relationship one perceives to be in (e.g. exclusive, casual or no relationship). RS is a variable that encompasses important psychological determinants of condom use, although it has often been manipulated as a demographic variable. On a superficial level, a body of research has revealed that people in casual relationships tend to use more condoms than those in exclusive relationships (Bowleg, Lucas and Tschann 2004, Manlove, Ryan and Franzetta 2004, 2007). On a deeper level, research findings in this domain suggest that people attribute certain meanings to their sexual relationships, which, in turn, interact with the meanings attributed to condom use. Meanings of safety, love and intimacy are typically attributed to exclusive relationships, and non-condom use is often perceived as a means to achieve and sustain intimacy, due to the trust and psychophysical proximity it presupposes. In the context of an exclusive relationship (or of any relationship that is perceived as exclusive), condom use can be regarded as a threat to the experienced intimacy and, in addition, it carries connotations of infidelity (Fortenberry *et al.* 2002, Kordoutis, Loumakou and Sarafidou 2000). Although viral dangers from STIs also threaten the experienced physical and emotional intimacy, empirical findings reveal that sustaining high levels of intimacy in a relationship via non-condom use can outweigh viral protection (Rhodes and Cusick 2000). Relevant to this, epidemiological studies (e.g. Miller and Green 2002, Kiriakis *et al.* 2003, 2004)

have provided evidence which relates RS to STIs, pointing out that low partner change and low risk perception in heterosexual relationships are the most consistent antecedents of HPV (the human papilloma virus) and chlamydia. Thus, contrary to commonly held beliefs, people who are in heterosexual relationships, who do not change partners frequently and who perceive themselves as safe, may be the highest risk group for common STIs.

A further factor, past behaviour, has been found to exert a direct influence on subsequent behaviour, including sexual risk-taking, and attempts have been made to include it in the TRA/TPB framework (e.g. Rise 1992, Ouellette and Wood 1998, Leone, Perugini and Ercolani 1999, Lugoe and Rise 1999, Norman, Conner and Bell 2000, Rhodes and Courneya 2003b, Umeh and Patel 2004). Investigators (e.g. Ronis, Yates and Kirscht 1989, Verplanken and Aarts 1999) have attributed past behavioural influences to habit formation, arguing that only first-time experiences are acted out in a planned and deliberate fashion. Thereafter, everyday activities, including those important to health, are repeated until they become habits. Contrary to earlier data that yielded habits as completely non-volitional (Fazio 1986), it is now demonstrated that habitual/automatic behaviours can be either non-volitional or partly volitional (Bargh 1989, Sutton 1994). Degree of automaticity may depend on context constancy (Ouellette and Wood 1998, Ferguson and Bibby 2002, Wood, Quinn and Kashy 2002), that is, behaviours occurring in unstable, changing contexts are less automatic and require conscious deliberation. In contrast, behaviours requiring minimal thought (habits) are likely to occur in contexts similar to the one in which the behaviour was initially learned and practised. Other authors fail to see the explanatory value of past behaviour and reject its inclusion, as a core variable, in cognitive-based theoretical models: Ajzen (1991) argues that the effects of past behaviour on intended and future behaviour should be mediated by the variables of the social-cognition models. In any case, the exclusion of past behavioural influences has been offered as one of the criticisms of social-cognition models (Eagly and Chaiken 1993) and one of the explanations of unsuccessful safe-sex interventions (Albarracín and McNatt 2005).

Our study builds upon the TRA, aiming to explore the added relevance of TP, past behaviour and RS on intended non-condom use in a sample of young healthy undergraduates. The study investigated the predictive powers of the TRA as a function of different relationship contexts whilst inspecting the impact of past behaviour. We hypothesised that the TRA variables would correlate with and predict intended non-condom use, with TP, past behaviour, and RS increasing the amount of variance explained. Furthermore, TP and RS were expected to moderate the attitude-intention relationship, revealing differences in attitudes and intentions towards unprotected sex, due to differential TP and RS. Because the theory of time perspective (Zimbardo and Boyd 1999, Boyd and Zimbardo 2008) argues in favour of temporal ethnic differences, expecting populations to score differently on TP because of gross societal variations, we tested this assumption with British and Greek university undergraduates. According to the theory, a present TP would be more typical of Mediterranean/Southern European populations, whereas a future TP would be more typical of Northern European ones. Thus, our study served as a test of the suitability/accuracy of the theory of TP in the study of non-condom use in British and Greek samples. Although concerns have been raised (e.g. Rüdell and Diefenback 2008) about using ethnicity in the study of health behaviours, given that ethnic categories may be too broad, ethnic differences have extensively been investigated in sexual-risk research, as well as requested by policymakers (Wyatt 1991, Ross 1998). We argue that manipulating "ethnicity" is meaningful and justified when the study aims to test theoretical tenets arguing for ethnic variations, and when the data are to be generalised to the subgroup in question whose composition is specified. This British-Greek comparison is novel in respect to the assessment of sexual risk and TP.

Method

Design

The study used a cross-sectional self-report questionnaire with two cohorts (British and Greek university undergraduates), which were convenience samples. Cross-sectional design and

convenience sampling were deemed acceptable, as this study aimed to test theoretical tenets (application of the theories of time perspective and reason action); and make conclusions only for the population under consideration (our British and Greek university undergraduates).

Participants

The study sample comprised 197 sexually active university students; 93 (47%) were British, recruited from a university in the south west of England, and 104 (53%) were Greek, from a university in central Greece. Table 1 shows descriptive statistics.

Measures

Participants completed a written questionnaire, which included demographic details (age, gender, ethnicity) and four sections relating to details of time perspective, current partner relationship, and intended and past sexual risk-taking:

1. Time perspective. TP was measured via the ZTPI scale (Zimbardo and Boyd 1999), which contained the subscales of present fatalistic, present hedonistic and future orientations. Scoring was on a 5-point likert scale, according to how characteristic each statement is of the respondent (ranging from 1 "very characteristic" to 5 "very uncharacteristic"). Given that past orientations have not been linked to risk-taking, only the 37 items measuring present and future TP were included in the questionnaire. Examples of the present hedonistic scale (a = 0.82) include 'it is important to put excitement in my life' and 'I try to live my life as fully as possible, one day at a time', and of the present fatalistic (*a*= 0.76) 'you can't really plan for the future because things change so much', and 'fate determines much of my life'. A future TP (*a* = 0.68) is reflected in items such as 'before making a decision I weigh the costs against the benefits', and 'it upsets me to be late on appointments'.
2. Relationship status. RS was measured by the item 'for the last six months, I've been in'. Participants had to choose from 'an exclusive relationship, 'non-exclusive/casual relationship(s)', and 'no relationship/single'.
3. Frequency of past behaviour. Past unprotected sex was measured by the two items: "in the course of the last six months how often did you have unprotected sex", scored on the verbal scale of "every time I had sex", "most of the times I had sex", "about half of the times I had sex", "less than half of the times I had sex", and "never"; and "in the course of the last six months I had unprotected sex", scored on a 5-point likert scale, ranging from "always did" (1) to "never did" (5).

Table 1: Participant mean scores, standard deviations, and percentages (as relevant) of study variables for British samples (*n* = 93), Greek samples (*n* = 104) and total sample (*N* = 197)

Variable	British		Greek		Total sample	
	M(SD)	%(*n*)	M(SD)	%(*n*)	M(SD)	%(*n*)
Past non-condom use	2.70(1.64)		2.00(1.4)		2.30(1.5)	
Intended non-condom use	2.61(1.44)		2.31(1.23)		2.45(1.33)	
Attitudes	2.74(0.89)		3.42(0.93)		3.10(0.97)	
Subjective norms	3.44(1.06)		3.64(0.75)		3.54(0.92)	
Future TP	3.36(0.42)		3.28(0.49)		3.32(0.46)	
Hedonistic present TP	3.52(0.60)		3.60(0.53)		3.50(0.52)	
Fatalistic present TP	2.84(0.55)		2.91(0.62)		2.80(0.60)	
Age	20 (3.03)		22 (4.18)		21.2 (3.87)	
In exclusive relationship		57% (53)		61% (63)		59% (116)
In casual relationship		24% (22)		20% (21)		22% (43)
Single		19% (18)		19% (20)		19% (38)
Male		27% (25)		29% (30)		28% (55)
Female		73% (68)		71% (74)		72% (142)
British						47% (93)
Greek						53% (104)

4. Direct measures of the theory of reasoned action. TRA measurement was in line with Ajzen and Fishbein's (1977) and Ajzen's (1991, 2002) recommendations of compatibility (attitudes and intentions be defined in terms of exactly the same elements), and specificity versus generality (creating measures that capture the behaviour without overly restricting it in a context). Thus, intentions (a = 0.95) were measured by the three items "I intend to have unprotected sex in the following 6 months", "I plan to have unprotected sex in the following 6 months", and "I would like to have unprotected sex in the following 6 months". Responses were structured on 5-point likert scales ranging from definitely true (1) to definitely false (5) for the first two items, and from "strongly agree" (1) "to strongly disagree" (5) for the third. Attitudes towards non-condom (a = 0.84) use were obtained by 5-point likert scaling of bipolar adjectives (i.e. enjoyable-unenjoyable, pleasant-unpleasant, good-bad, beneficial-harmful and wise-foolish). Subjective norms (a = 0.68) were measured by the two items "the people in my life whose opinions I value would: strongly approve (1) to strongly disapprove (5) of my having unprotected sex in the next 6 months"; and "most people who are important to me have unprotected sex", scored in terms of a 5-point likert scale, ranging from "definitely true" (1) to "definitely false" (5).

The definitions of unprotected sexual activity as "any type of sexual activity (e.g. oral, vaginal anal sex) without the use of a condom", and exclusive relationship as "an emotional (especially sexual) association restricted to two people", were provided to aid participants' understanding of concepts and terminology used in the questionnaire. As we wanted to emphasise behaviours that are inherently risky and potentially threatening to sexual health, we conceptualised sexual risk-taking as "unprotected sex/non-condom use" (instead of "safe sex" or "condom use").

The TRA and TP scales were translated from English to Greek and then back-translated by a bilingual (Greek-English) health psychologist.

Procedure

Ethical approval was granted by the departmental research ethics committees of the participating UK and Greek universities. Participants were approached in the context of a lecture with a brief description of the study, enabling direct supervision of respondents, and were assured (verbally and in writing) that their responses would be anonymous and confidential. Informed consent sheets were signed before data collection and a group debrief took place immediately following questionnaire completion. This procedure lasted approximately 25 minutes. Of the 100 questionnaires administered to the British students, 96 were returned, and 93 were deemed usable (three were rejected due to incomplete answers). In the Greek samples, 105 questionnaires were administered, all were returned, 104 of which were usable. Adequate sample size is particularly relevant for regression analyses and we followed the recommendations of Stevens (1996:72) arguing that "for social sciences research, about 15 participants per predictor are needed for a reliable equation". For the hierarchical regression analyses we had four predictor variables [n = (15 × 4) = 60] and for the standard regression analysis we had seven predictors [n = 15 × 7 = 105]. This sample size was deemed acceptable, as the primary focus of this study was theory testing (i.e. whether present temporal perspective would be more typical of Mediterranean/southern European populations, and a future temporal perspective would be more typical of northern European populations; whether the TRA would differ as a function of stable versus unstable RS). Moreover, cross-sectional designs, with only one time point of testing, do not necessarily require larger samples, which help account for attrition at later stages of the study.

Data analyses

Before statistical analyses, scores of past behavioural frequency, TP and intentions were reversed so that high scores indicate high levels of scale, thus ensuring statistical and conceptual clarity. Data were analysed using correlation, regression and ANOVA procedures. Pearson's r correlation and ANOVA obtained associations and differences amongst variables. Regression analyses were performed to evaluate the predictive ability of the TRA over non-condom use, as well as the impact of TP and RS, and past behaviour on and beyond the TRA.

Results

Descriptive data

Table 1 shows the descriptive statistics (percentages, means and standard deviations) for the British compared to the Greek sample on variables of behavioural frequency for unprotected sex, intended non-condom use, TP, RS, gender and age. All participants were sexually active during the previous six months. Ethnic differences were found for past unprotected sex and attitudes. British participants reported more non-condom use in the past 6 months (M = 2.7, SD = 1.64) than Greek participants (M = 2.0, SD = 1.4; $t(181) = 3.37$, $p = 0.001$). The effect size, calculated by Eta squared was 0.06, indicating that culture explained 6% of past non-condom use variance; according to Cohen (1988) this is a moderate effect. Consonant with the behaviour, British participants reported having fewer negative attitudes towards non-condom use intentions (M = 2.74, SD = 0.89), than Greek participants (M = 3.42, SD = 0.93; $t(195) = 5.25$, $p = 0.000$). The effect size, calculated by Eta squared was 0.0132, suggesting that ethnicity explained 13.2% of attitudes variance; a medium to large effect (Cohen 1988). Although future TP was higher for the British sample [M = 3.39, SD = 0.42] than the Greek [M = 3.28, SD= 0.49], this difference did not reach statistical significance, and the remaining TP scores were also similar between the samples. No other statistically significant differences were found.

Correlates of non-condom use intentions

There was a statistically significant negative relationship between attitudes and intended non-condom use [r = -0.59, n = 197, $p < 0.01$], indicating that negative attitudes towards unprotected sex were correlated with weak intentions to engage in unprotected sex. Relationship status was also significantly associated with intended non-condom use [r = 0.32, n = 197, $p <$ 0.01]. Finally, past non-condom use had the strongest relationship with non-condom use intentions [r = 0.63, n = 197, $p < 0.01$], indicating that participants who had engaged in unprotected sex in the past, intended to do so in the future. The coefficient of determination revealed that past behaviour explained 40% of the variance of behavioural intention scores, attitudes explained 35% of the variance, and RS accounted for 10% of the variance. Significant associations were not obtained for subjective norms and TP.

Statistically significant differences were revealed in intended non-condom use for participants in exclusive, casual and no relationships [F (2, 194) = 13.97, $p < 0.0001$]. The effect size, calculated by Eta squared was 0.125, explaining 12.5% of intended non-condom use variance, a medium-large effect (Cohen 1988). Post-hoc comparisons Using the Tukey HSD test indicated that the mean score for participants in exclusive relationships (M = 2.81, SD = 1.43) was significantly different from participants in no relationship (M = 1.6, SD = 0.81), and from participants in casual relationships (M = 2.24, SD = 1.02). This result revealed the impact of RS on intentions, suggesting that participants in relationships had stronger intentions not to use condoms, as compared to single participants. No other statistically significant differences were found.

Predicting non-condom use intentions

Hierarchical linear regression analysis assessed the predictive ability of past behaviour and RS over the TRA (see Table 2). RS was transformed into a dichotomous variable (i.e. participants who were in an exclusive relationship or not). TRA variables were entered at Step 1, followed by past behaviour at Step 2 and RS at Step 3. The two TRA variables explained 35% of the variance of non-condom use intentions (R^2 = 0.35), with past behaviour producing a significant increment of 15% (R^2 change = 0.15). The overall model was significant [F (3, 193) = 64.99, $p < 0.0001$]. RS provided a significant increment of 1% (R^2 change = 0.01). The overall model was significant [F (4, 192) = 50.73, $p < 0.0001$].

A separate hierarchical linear regression was conducted to estimate the contribution of the TP items on the TRA. Attitudes explained 35% of the variance of non-condom use (R^2 change = 0.62) and the overall model was significant [F (5, 191) = 22.68, $p < 0.0001$]. Although present fatalistic TP alone provided a significant unique contribution to the TRA [b = -0.17, $p < 0.001$], the TP items

Table 2: Predicting non-condom use intentions: hierarchical regression analysis

Predictors	*B*	SE *B*	β	R^2
Step 1				
Attitudes	-0.81	0.08	-0.60***	
Subjective norms	-0.02	0.09	-0.01	
				0.35***
Step 2				
Attitudes	-0.49	0.08	-0.35***	
Subjective norms	-0.09	0.07	-0.06	
Past behaviour	0.35	0.05	0.41***	
				0.15***
Step 3				
Attitudes	-.48	.08	-.35***	
Subjective norms	-.09	.07	-.06	
Past behaviour	.35	.05	.41***	
RS	0.31	0.15	0.11*	
				0.01*

*p < 0.05, **p < 0.001, ***p <0 .0001

together did not add significantly (R^2 change = 0.02, ns). Standard multiple regression analysis was performed to assess how much variance would be explained by the TRA, TP and past behaviour, for participants who were either in exclusive relationships (Model 1) or single (Model 2). This test aimed to assess how much variance was explained by the predictor variables, as a function of relationship context (see Table 3). In Model 1, past behaviour made the strongest unique contribution to explaining intended non-condom use (b = 0.49), followed by attitudes (b = -0.38), and fatalistic TP (b = -0.24). A future orientation also played a small yet significant role in this model (b = -0.14). The model was significant [F (7, 108) = 18.52, p < 0.0001]. In Model 2, attitudes made the strongest unique contribution to explaining intended non-condom use (b = -0.47), followed by past behaviour (b = 0.38), and present fatalistic TP (b = -0.26). The model was statistically significant [F (7, 73) = 9.40, p < 0.0001].

Time perspective and relationship status as independent moderators of attitude on condom use

The differential effect of attitudes (independent variable) on intended non-condom use (dependent variable) was measured as a function of TP and RS (moderators). Results revealed that present-fatalistic TP moderated the attitude-intended behaviour path. The interactive term significantly increased the variance in intended non-condom use by 2%, (from 36% in Step 1 to 38% in Step 2), suggesting that participants high in fatalistic TP had stronger intentions to engage in unprotected sex, regardless of their attitudes. For relationship status, results revealed significant main effects between RS and intended non-condom use [F (2, 191) = 14.02, p < 0.0001], and between attitudes and intended non-condom use [F (1, 191) = 30.81, p < 0.0001]. A statistically significant interaction emerged between RS (exclusive versus casual versus single) and attitudes (positive versus negative) to influence intended non-condom use [F (2, 191) = 3.19, p < 0.05]. Hence, participants favouring non-condom use tended not to use condoms, particularly when in exclusive relationships. This effect was less pronounced for participants in casual relationships and even less pronounced for singles.

Discussion

Results revealed that TP, RS, and past behaviour interacted with attitudes in condom use decisions, suggesting thus their inclusion in sexual risk research, alongside socio-cognitive variables.

Whilst TP did not correlate significantly with unprotected sex, it did demonstrate moderating abilities. Fatalistic present TP significantly enhanced the TRA by 2% and moderated the

Table 3: Predictors of condom use intentions as a function of RS: standard multiple regression analyses

Predictors	Participants in exclusive RS (Model 1)			Single participants (Model 2)		
	B	*SE*	β	*B*	*SE*	β
Attitudes	-0.55	0.12	-0.38***	-0.49	.10	-0.47***
Subjective norms	-0.15	0.10	-0.10	0.07	0.09	0.07
Future TP	-.47	.25	-.14*	-.20	.19	-.10
Fatalistic present TP	-0.54	0.18	-0.24**	-0.46	0.19	-0.26**
Hedonistic present TP	0.08	0.21	0.03	0.24	0.26	0.11
Past behaviour	0.43	0.07	0.49***	0.34	0.08	0.38***
Ethnicity	0.45	0.21	0.16*	0.36	0.17	0.18*

*p < 0.05; **p < 0.001; ***p <0 .0001

attitudes-intentions path, suggesting that participants high in fatalistic TP were strongly inclined not to use condoms, irrespective of their attitudes. This result confirms theory of time perspective assumptions that view present oriented individuals (hedonists and fatalists) as taking more health-related risks, than future oriented individuals, and adds to similar findings (e.g. Rothspan and Read 1996, Hutton *et al*. 1999, Zimbardo and Boyd 1999). However, our results were not in line with the theory's expectation of generalised ethnic differences in temporal orientation, assuming people living in North, industrialised countries as more future-oriented than those living in South, Mediterranean, and less industrialised regions. In our study, both British and Greek participants were predominantly present oriented, scoring highest on the hedonistic scale. Interestingly, the regression analyses showed that in exclusive relationships future TP was inversely related to non-condom use intentions. Thus, participants in exclusive relationships (but not single ones) reported weaker intentions to have unprotected sex, if they scored higher on the future TP scale. Once again, this result is consonant with core assumptions of the theory of time perspective (i.e. less risk taking for the future-oriented) but was not related to the cross-cultural dimension of the theory.

At a glance, it may be puzzling why university students score high on fatalistic time perspective; fatalism seems incompatible with university way of life, which is based on future oriented activities, such as working towards exams and papers, studying and planning for further studies and career goals etc. Scoring high on items like 'you can't really plan for the future because things change so much', and 'my life is controlled by forces I cannot influence' contrasts with academic mentality, typically linking present behaviours with future outcomes, fostering thus, competence and self-efficacy. However, this paradox is not hard to comprehend when considering that a fatalistic TP is strongly correlated with low income, young age, being male, and being a student (Gonzalez and Zimbardo 1985, Zimbardo and Boyd 1999). Indeed, the university years are characterised by financial instability and uncertainty about future occupational prospects, especially in countries such as Greece where youth unemployment rates are very high.

In 2007 Greek unemployment was 22.9% for people under 25 years of age — the highest reported rate amongst EU country members (EUROSTAT 2009). Although British unemployment rates for people under the age of 25 were lower in 2007 (14.3%), British undergraduates face the additional stress-provoking situation of student loans and long-term debt, which has been consistently linked to depression and anxiety amongst undergraduates (Scott and Lewis 2002, Cooke *et al*. 2004). Unsurprisingly, a present fatalistic TP presupposes a pessimistic outlook as well as of depressive and anxious states (Zimbardo and Boyd 1999, Boyd and Zimbardo 2008), which in turn, are linked to risk-taking in young people, possibly as a means of dealing with negative emotion (Allberg and Chu 1990, Bender 2006). Depression has specifically been associated with sexual risk-taking; for example, Kosunen *et al.* (2003) demonstrated that self-reported depression increased in proportion to the number of sexual partners and with the non-use of contraception, in adolescents.

Past non-condom use was significantly associated with and had a direct effect on non-condom use intentions above the influence of the TRA, and was the strongest predictor of intended non-condom use in relation to all the variables of this study. In the literature there is considerable disagreement about how to conceptualise and interpret the contribution of past behaviour — some researchers see the impact of past behaviour as measurement error or the presence of factors that have not been accounted for (e.g. Ajzen 1991, 2002), whilst others see past behaviour as a meaningful construct, demonstrating the influence of habit on future behaviour (Verplanken and Aarts 1999). We ascribe to the latter view: our findings add to a now voluminous body of data showing that the additional and unique variance explained by past behaviour (over and beyond the variables of social cognition) is too substantial to be dismissed. Authors (e.g. Rise 1992, Ouellette and Wood 1998, Leone *et al*. 1999, Lugoe and Rise 1999, Norman *et al*. 2000, Fekadu and Kraft 2001, Yzer, Siero and Buunk 2001, Rhodes and Courneya 2003b, Umeh and Patel 2004, Molla, Nordrehaug Åstrøm and Brehane 2007) have argued for the consideration, even inclusion, of past/habitual behaviour in models of social cognition, and especially the TRA/TPB.

Notably, a novel finding of our study is the demonstration that attitudes and past condom use (i.e. habitual action) can have a differential impact on condom use depending on the immediate relationship context (in a relationship or single). Analyses revealed that participants who had used condoms in the past intended to use them in the future, irrespective of their relationship status. However, participants who had not used condoms in the past did not intend to use condoms in the future, especially if they were in an exclusive relationship (this effect was less pronounced for participants in casual relationships, and much less pronounced for those in no relationship). Regression analyses revealed that past behaviour interacted with attitudes in the prediction of intended non-condom use. In the context of exclusive relationships, past non-condom use was a strong predictor and attitudes were relatively weak. By contrast, in the contexts of casual relationships and being single, past behaviour was a weaker predictor than attitudes. Thus, it can be argued that the experience of having an exclusive relationship in a "stable context" facilitated the "transfer" of past behaviours (i.e. non-condom use) in the present, whereas unstable contexts facilitated more conscious cognitive processes, favouring condom use. RS added a significant 5% to the prediction of intended non-condom use, over and beyond attitudes and subjective norms and moderated the attitudes-intended unprotected sex relationship. In addition, a future TP was found to be predictive of non-condom use intentions, but only for participants in exclusive relationships. Consistent with the theory of time perspective, participants high in future TP, reported weaker intentions to have unprotected sex. Possibly, therefore, within the context of an exclusive relationship, a future TP might help differentiate those who intend to use condoms (intenders) from those who do not (non-intenders).

Subjective norms were not found to correlate with or predict non-condom use intentions. This is not altogether surprising, as studies have provided partial support for either attitudes or norms being linked to sexual risk (Mizuno *et al*. 2000, Bosompra 2001, Glassman and Albarracín 2003), and it may well be that the differential influence of these variables is sample specific, instead of behaviour specific (Ajzen 1991). This notwithstanding, the possibility exists that there are important referents specific to our study population that we did not uncover (for this also refer to overall discussion section).

Overall discussion

Our findings demonstrated attitudes as being the strongest predictors of non-condom use intentions for participants who had casual relationships or were single (i.e. unstable relationship context), and past behaviour as the strongest predictor of non-condom use intentions for those who perceived themselves to be in an exclusive relationship (i.e. stable relationship context). In addition, it was demonstrated that a fatalistic present TP predicted more non-condom use intentions in the study population in general, and a future TP predicted less non-condom use intentions for those who were in an exclusive relationship. No differences were found in temporal orientation as a function of being a British or Greek university student. Thus, our results provide support for the basic tenet

of the theory of time perspective (i.e. TP is linked to health and risk behaviours) but do not support the ethnic dimension of the theory (i.e. residents of countries in Northern countries are typically more future oriented than those in Southern ones). In line with other studies that have linked university students' fatalistic/depressive ideation to sexual risk-taking (possibly mediated by economic uncertainty), our data also found fatalistic TP as a strong predictor of non-condom use.

Even though our primary aim was theory testing, and the cross-sectional nature of our design does not allow clear conclusions for building interventions, our findings have relevance for intervention strategies. The overall prominence of past behaviour implies that, at the very least, safe-sex interventions need to start early, ideally before the onset of sexual activity. Some prevention efforts (e.g. Adam and De Wit 2004; De Wit and Adam 2008) have been directed towards initiating and sustaining safe-sex behaviour, in an attempt to make condom use a habit. In these preventative efforts, participants are presented with realistic situations where sexual intercourse can occur and then asked to make specific and detailed plans about how and when to ensure safe sex. These detailed plans take the form of implementation intentions (Gollwitzer 1993), and several studies have shown the ability of implementation intentions to translate goals into actions, by modifying already existing behavioural patterns (e.g. Orbell and Sheeran 2000, Sheeran and Orbell 2000). The impact of past behaviour was strongest for participants who perceived themselves to be in exclusive relationships, and those participants were not inclined to use condoms. Previous research findings have consistently attributed meanings of safety, love, and intimacy to exclusive relationships, and found non-condom use a means to achieve and sustain psychophysical intimacy. In the context of an exclusive relationship (or of any relationship that is perceived as exclusive), condom use is often regarded as a threat to the experienced intimacy and, in addition, condoms carry connotations of infidelity and mistrust (Kordoutis *et al.* 2000, Fortenberry *et al.* 2002). The challenge therefore, for safe-sex interventions may be finding plausible ways to link condoms use with romantic love, and incorporate condoms in "serious" relationships. Despite the ongoing debate in health psychology concerning the relative influence of attitudes or past behaviour in health (and sexual) risk research, we do not see a strict divide or polarity between the two constructs. Historically, attitudes have been studied as a three-part construct, comprising an evaluative reaction, exhibited in one's beliefs, feelings, and inclinations to act (Breckler 1984). Thus, successfully changing attitudes would also imply changing their related behaviours and vice versa. The results of this study suggest the value of identifying the unsafe sex attitudes that need to be modified, depending on relationship status.

In terms of temporal influences, the influence of TP was not strong enough to suggest basing a safe-sex intervention on TP assumptions. Still, we argue that safe-sex interventions could be enhanced by tailoring their tasks according to individual differences in TP, and by showing individuals how to visualise their future and anticipate the consequences of their actions. Relevant to this, we envision safe-sex interventions as enhancing overall emotional well-being, in addition to prophylaxis. We showed that people high in fatalistic TP have stronger non-condom use intentions, and discussed the links between fatalism, depression, and sexual risk-taking. Thus, an HIV intervention that aims to balance one's TP will potentially have the dual benefit of reducing negative emotional states, as well as sexual risk-taking.

Whilst this study facilitates the understanding of different aspects of non-condom use in Greek and British university undergraduates, we acknowledge a number of weaknesses. We acknowledge the lack of preliminary informative research (e.g. focus groups) for the purpose of uncovering indirect measures of the beliefs underlying attitudes and subjective norms. Although such a process is not obligatory (Bennett and Bozionelos 2000) we might have identified important social referents that influence non-condom use, other than those measured by the direct norms construct. Our findings are limited by the validity of the self-reported measures and cross-sectional setting. Although efforts were made to enable participants' memory of past non-condom use (i.e. questions had a specific recall period, as well as an optimal period for reliable recall), the possibility always exists that recollection may have not been completely accurate, due to the retrospective nature of the inquiry. Longitudinal research is needed to establish the stability of the observed associations

for the identified correlates and predictors of non-condom use. This notwithstanding, we believe that the ongoing debate about the temporal relationship amongst behaviour, intentions, attitudes and norms need not prevent researchers from using cross-sectional designs to study these constructs, and reassurances of the validity and predictive ability of our findings come from the high internal consistency of the three measures of behavioural intentions (Cronbach's alpha of 0.92). In retrospect, we find the operationalisation of sexual risk-taking as "non-condom use" as somewhat problematic in terms of how the participants may have perceived it. Although we wanted to be sure we measured an inherently risky (and not health-promoting) behaviour and participants themselves voiced no complaints, the possibility exists that some might have found it "awkward" or "harsh" to answer items in terms of 'intending to have unprotected sex'.

"Gender" was treated as a demographic variable and not as a predictor of sexual risk-taking. In the absence of a qualitative component revealing potential gender-based differences, we wanted to refrain from reporting gender influences without accounting for underlying biological/socialisation causation, as such approaches potentially perpetuate existing sex stereotypes in risk research (i.e. men are inherently risk takers, whereas women are inherently careful). In our demographic analyses, data revealed no statistically significant gender differences for any of the study variables. Still, we acknowledge the value of further investigating gender-related influences and variations, assuming that those were obtained from the study population, per se.

Finally, a potential weakness of the study relates to sample size: although we deemed our sample size to be acceptable on the basis of the study aims and design (i.e. theory testing; absence of attrition considerations), we recognise that sample size is important in determining the strength of associations. Future work building on these findings would therefore benefit from expanding the sample to test if the effect remains and as such is representative of a larger population.

Relevance of findings to African samples

Although this study was conducted in Europe, we argue that the theories employed, as well as the findings are relevant to African youth. We are in line with other authors (Fekadu and Kraft 2000, Bosompra 2001, Bandura 2002) who favour the use of Western-based theories in African settings, and we question notions (e.g. Airhihenbuwa and Obregon 2000) of alleged deep-rooted cultural differences between people in the South and in the North. In a critical review of studies using the TRA/TPB to investigate sexual risk-taking in sub-Saharan African youth, Protogerou, Flisher, Aarø and Mathews (in press), demonstrated that the African data compared favourably to the international literature, and made a strong case for the suitability and applicability of the TRA/TPB in African contexts. We hope our study can potentially inspire (South) African authors towards using the construct of time perspective in their health-related research. A first attempt has been made: in particular Protogerou, Flisher and Wild (unpublished data) used the TP in conjunction with the TPB to study sexual risk taking in South African university undergraduates. Similar to the findings of this study, present fatalistic TP was significantly linked to condom use. Finally, we see the "divide" between African-based versus Western-based risk-taking decisions and behaviours as based on stereotypes of people as a whole (i.e. the Africans being collective, whilst the Westerners being individualistic), and not founded on empirical data.

Conclusion

In sexual risk research, emphasis has been on rational-cognitive theoretical models, often downplaying the influence of contextual, non-conscious and habitual factors. This omission may be related to the failure of some health promotion campaigns to enhance condom use (Grimely, Prochaska and Prochaska 1997). In addition to attitudes, our findings provide support for taking into consideration the combined effects of relationship and past behaviour when studying non-condom use intentions and planning safe-sex interventions. Thus, time perspective is indicated as a valuable addition to the study of sexual risk.

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