# Is a web video effective in increasing intention to use condoms? A test based on the Health Action Process Approach

*Andrea Gragnano, Massimo Miglioretti*

*Department of Psychology, University of Milano-Bicocca*

*ABSTRACT*. Nonostante la grande diffusione, l'efficacia dei video via Internet nella promozione della salute non è ancora stata dimostrata. Utilizzando come riferimento teorico il modello HAPA il presente studio valuta, su 352 partecipanti reclutati attraverso Facebook, l'efficacia di un video via Internet che promuove l'utilizzo del condom per incrementarne l'intenzione d'uso. Mediante modelli di equazioni strutturali lo studio analizza anche la bontà della fase motivazionale del modello HAPA rispetto al comportamento di utilizzo del condom. I risultati mostrano come i video via Internet possano essere strumenti efficaci nella promozione dell'uso del condom ma anche come questi debbano essere inseriti in campagne di promozione più strutturate per generare cambiamenti importanti. Il modello HAPA spiega il 33% della varianza nell'intenzione d'uso del condom mostrando la sua validità anche con questo tipo di comportamento.

*SUMMARY. Introduction: The effectiveness of internet video in the promotion of healthy sexual behaviours is still not proved despite the large diffusion of this tool on the web. It is useful to rely on the theories of behaviour change when tailoring and evaluating a health promoting video. The HAPA model is a well-known theory of behaviour change still not tested in the field of promotion of healthy sexual behaviour. This study tested the usefulness of the motivational phase of the HAPA model to the promotion of healthy sexual behaviour and the effectiveness of a video delivered via web in increasing the intention to use condoms. Methods: The data were collected among 352 Italian participants recruited through Facebook. Participants were randomly assigned to the vision of the video or to the control group. Assessments were pre and post the intervention. SEMs were used to test the hypothesis. Results: The HAPA model explains 33% of the variance of Intention to use condoms and fit the data well. Outcome expectancies and self-efficacy are significant predictors of intention and the role of risk perception is discussed. The video increases the intention to use condoms ($\beta = .11$ $p<.05$). The video was more effective among non-intenders than intenders. The moderating effect of the initial level of intention had a p value of .07. Conclusion: Web videos are potentially effective and efficient tools to use in broader campaigns promoting the use of condom. Theories of behaviour change have to be used to design effective and tailored web videos. The HAPA model demonstrated its validity for the behaviour of condom use.*

**Keywords:** *Health promotion, Video, Behaviour change*

# INTRODUCTION

AIDS and sexually transmitted infections (STI) prevention is a crucial fact for the health of people, even in the more developed countries. The vision of the Joint United Nations Program on HIV/AIDS (UNAIDS, 2011) 'zero discrimination, zero new infections and zero AIDS-related deaths' is an unrealized purpose: 27% more people living with HIV from 1999 to 2009 and since 2010 there have been no declines in new HIV infections among adults (UNAIDS, 2016). Although the largest epidemic hits the sub-Saharan region even in the high income countries the situation is not as positive as it might be expected. The number of newly infected people in North America increased from 66,000 in 2001 to 70,000 in 2009 (UNAIDS, 2010). In 2015, there were an estimated 91,000 new HIV infections in Western and Central Europe and North America (UNAIDS, 2016). Along with the problem of the HIV diffusion there is also the issue of the sexually transmitted infections (STI). WHO estimates 357 million new cases of curable STI like syphilis, gonorrhea, chlamydia, and trichomoniasis every year (World Health Organization, 2016).

Since unsafe sexual intercourses are the main cause of AIDS and STI, it is clear that the role prevention plays in contrasting these diseases is very important, but prevention interventions in the high income countries need to be more sophisticated and precise (UNAIDS, 2010). A ten-year review of HIV/AIDS mass campaigns (Noar, Palmgreen, Chabot, Dobransky & Zimmerman, 2009) showed that great improvements have been achieved in this field but also that the effects and efficacy of every single tool implemented in the campaigns is unclear. A better comprehension of the efficacy of the tools implemented is crucial if we consider the development of internet and new technology that bring new ways of communication and new tools for prevention that seem especially appealing for younger, the more threatened by HIV and STI.

One technique identified as important in the process of formation of the intention to change behaviour is the use of persuasive videos. This type of videos is commonly used in health promotion interventions and campaigns together with other techniques and with the diffusion of the Internet and the broadband they are gaining even more importance. However, because the exclusive use - not associated with other technique - of this tool is rare we do not have reliable data about the effect of video on people when delivered via web and not via TV. Examining the findings in social psychology and marketing it is possible to identify a set of characteristics that a video has to have to be effectively persuasive (Table 1). Internet has a great dissemination in the developed countries even if not equal to that one of the Television, and like this last one allows the transmission of attractive dynamic audio/video messages. The Internet is cost-effective and on-demand, namely it is cheap for the number of people that can be reached by and it is the subject that decides when and where to use the intervention (Roberto, Zimmerman, Carlyle & Abner, 2007).

Like any other tool of a health promotion campaign, the video to be effective has to be tailored, that is to provide personally relevant messages (Krebs, Prochaska & Rossi, 2010). To tailor the message it is necessary to rely on the theories of behaviour change that indicate what dimension of the person has to be persuade. The Health Action Process Approach (HAPA; Schwarzer, 2008) divides the changing process in a *preintentional motivational* phase and a *postintentional volitional*. In the preintentional motivational phase individuals develop an intention throughout a series of weighting and evaluations. The factors involved at this stage are risk perception, outcome expectancies, and self-efficacy. The most important and general custom tailoring that can be made following the HAPA model is the distinction between the messages addressed to *intenders* and the ones addressed to *nonintenders*. That is, the effect of a video promoting the use condom will have different effect on people with a low or high initial intention to use condom.

The HAPA has been tested with many behaviours like alcohol consumption, eating habits, physical activity, performing regular breast self-examination, or seat belt use (Băban & Crăciun, 2007) but only three studies tested the HAPA model with the health behaviour condoms use (Carvalho, Alvarez, Barz & Schwarzer, 2015; Teng & Mak, 2011; Tsui, 2010).

# AIMS OF THE STUDY

This study has three related purpose. First, to verify if the motivational phase of the HAPA adequately predicts the formation of intention of condoms use. Second, to test the efficacy of a video delivered via web in increasing the intention to use condoms. Finally, we aimed at support the utility of the HAPA model to design tailored health

**Table 1** – Characteristics of an effectively persuasive video

| Elements | Characteristics | How they should be | Sources |
|---|---|---|---|
| Source of the message / main character of the narration | Authority | Perceived as real, not pretended | Miller, Collins & Brief (1995) |
| | Credibility | Competence<br>Reliability<br>Good faith | McCroskey & Teven (1999) |
| | Social attractiveness | Pleasantness<br>Similarity with the audience<br>Physical attractiveness | Rhoads & Cialdini (2002)<br>Anderson & McMillon (1995)<br>Chaiken (1979) |
| Message | Rational/Emotional appeal | Effective if the central/ peripheral route of thinking of the audience is activated | Petty, Wheeler & Tormala (2003) |
| | Fear appeal | Only if it is followed by a message that persuade the audience to be able to face the threat | Roberto et al. (2007) |
| | Arguments in support | Present | Reynolds & Reynolds (2002) |
| | Story + emotional appeal | More effective than quantitative and factual evidences | Gray & Harrington (2011) |
| Audience | Previous cultural norms and attitudes | Recall them | Giles & Street (1994) |
| | Characters of the audience<br>Features of the context | Careful evaluation | Burgoon, Denning & Roberts (2002) |

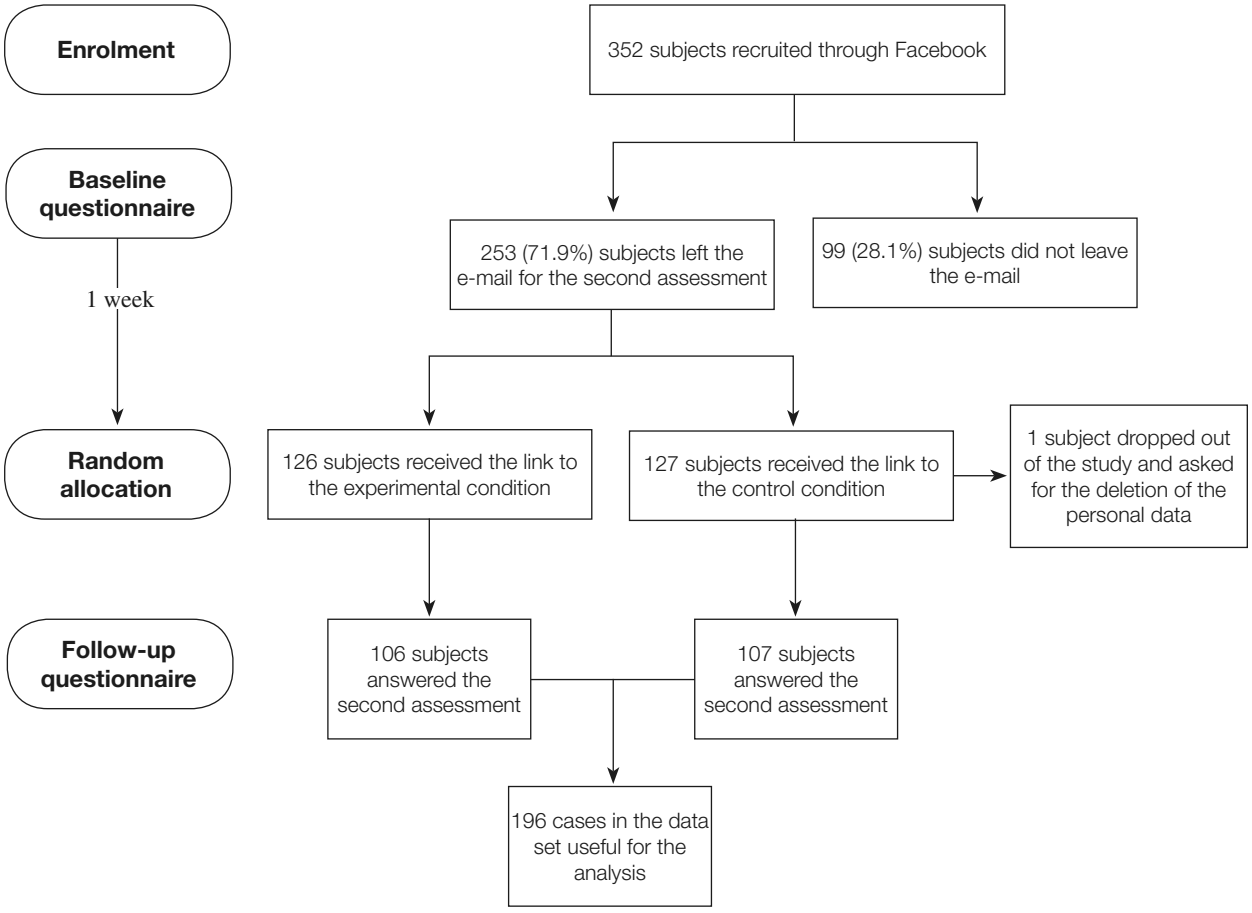
promotion web video. That is, the video will be more effective for non-intenders as identified by the HAPA model. Therefore, we hypothesized that:

- *H1*: The components of the HAPA model, namely risk perception, outcome expectancies and action self-efficacy, will predict the level of intention to use condom at baseline;
- *H2*: The vision of the video delivered via web will increase the intention to use condoms;
- *H3*: The level of initial intention to use condom will moderate the efficacy on intention of the web video. The video will be more effective among subjects with a lower intention (non-intenders).

## PARTICIPANT

We recruited 352 participants at the baseline (Figure 1). Of these the 8% had not had a complete sexual intercourse at the time of the baseline assessment and so automatically skipped the questions about the past use of condom. The sample was investigated for demographic characteristics, sex (45% of male), age (68% between 16 and 25 years, 23% between 26 and 40, 9% more than 40), education (56% has a bachelor degree or higher), and occupation (56% were students, 36% workers, 5% unemployed and 3% were homemakers and pensioners). Only 10% of the participants were married or cohabiting

**Figure 1** – Participant flow chart




however 60% has a committed relationship.

Two-hundred-thirteen (60,5%) of the people involved at the baseline participated also to the follow-up. Chi-square analysis of the sociodemographic characteristics between the group of people that completed only the baseline and that one that completed also the follow-up did not revealed any significant difference (gender $\chi^2_{(1)} = .81$, $p = .43$; education $\chi^2_{(1)} = .025$, $p = .91$; profession $\chi^2_{(4)} = 7.78$, $p = .1$; civil state $\chi^2_{(1)} = 3.63$, $p = .07$; age $\chi^2_{(2)} = 2.97$, $p = .23$; state of relationship $\chi^2_{(1)} = .017$, $p = .91$).

## PROCEDURES AND MEASURES

We created a new questionnaire through the adaptation of others available in the literature. The questionnaire lasted about 15 minutes and consisted of two parts. The first part was composed by 10 socio-demographic items plus the request of an email address and the past use of condom. The second part contained 22 items assessing the social cognitive factors indicated by the HAPA model (Table 2). At the follow-up we submitted only the second part of the questionnaire.

We tested this set of questions through a confirmatory factorial analysis followed by a specification search (MacCallum, 1986) and a test for the invariance over time of the measurement model (Pitts, West & Tein, 1996). All the models were fitted using maximum likelihood estimate in LISREL (Jöreskog & Sörbom, 1996). The measurement model at the baseline and at the follow-up presented a good fit, $\chi^2(91, N = 196) = 204.33$, $p<.05$; $\chi^2/df = 2.25$, CFI = .93, RMSEA = .074; 90% CI [.059, .089] and $\chi^2(91, N = 196) = 190.70$, $p<.05$; $\chi^2/df = 2.10$, CFI = .94, RMSEA = .073; 90%

**Table 2** – Social cognitive and behavioural measures used in the research

| Variable | Citation | n. of items | Items |
|---|---|---|---|
| Past condom use (α at t0 = .94) | Based on Albarracín, Gilette, Earl et al. (2005) adapted following Schwarzer, Sniehotta, Lippke et al. (2003). | 2 | Ordinal-polytomous, from 0 times to 4 times (e.g., "Think about your last four sexual intercourses, how many times did you use condom?") |
| Intention to use condom (α at t0 = .93) (α at t1 = .90) | Based on Schwarzer & Renner (2000) and Schwarzer, Luszczynska, Ziegelmann et al. (2008) | 2 | 8-points Likert scale (e.g., "Referring to your next sexual intercourse, do you think you will use a condom?") |
| Perceived absolute vulnerability (α at t0 = .95) (α at t1 = .96) | Based on Schwarzer, Sniehotta, Lippke et al. (2003) | 4 | 7-points Likert scale (e.g., "I think my chances of contracting AIDS are…") |
| Perceived relative vulnerability (α at t0 = .97) (α at t1 = .98) | Based on Schwarzer, Sniehotta, Lippke et al. (2003) | 4 | 7-points Likert scale (e.g., "If compared to the other people of the same age and sex of mine, I think my chances of contracting Syphilis are…") |
| Perceived severity (α at t0 = .56)* (α at t1 = .68) | Based on Schwarzer, Sniehotta, Lippke et al. (2003) | 3 | 7-points Likert scale (e.g., "How much do you think Hepatitis is severe?") |
| Positive outcome expectancies (α at t0 = .58)* (α at t1 = .57) | Based on a research of the Centers for Disease Control and Prevention (2009) | 3 | 7-points Likert scale (e.g., "If I use condom, I will feel more relaxed") |
| Negative outcome expectancies (α at t0 = .63)* (α at t1 = .65) | Based on a research of the Centers for Disease Control and Prevention (2009) | 3 | 7-points Likert scale (e.g., "If I use condom, the pleasure will decrease") |
| Action self-efficacy (α at t0 = .87) (α at t1 = .89) | Based on Schwarzer, Renner, (2000) and Schwarzer, Luszczynska, Ziegelmann, et al. (2008) | 5 | 4-points Likert scale (e.g., "Even if it can affect the relationship, I am confident that I am able to use condom") |

*Note*. * The relative low level of Cronbach's Alpha is due to a low number of items in conjunction with a violation of tau equivalence (the items assessed different facets of the construct). Cronbach's α approaches reliability under condition of essential tau-equivalence (Cortina, 1993), otherwise it underestimates reliability (Graham, 2006). In these cases a better index of reliability is the composite reliability index (Bagozzi & Yi, 2011). The lowest composite reliability index was .65 for Positive outcome expectation at t1. This value is sufficient if there is a good fit of the model (Bagozzi & Yi, 2011).

CI [.058, .088] respectively. All the factor loadings in both models were statistically significant and both presented a mean item reliability of .65. Longitudinal metric invariance were respected since we obtained a ΔCFI lower than .010 (Cheung & Rensvold, 2002) between the model with the two measurement time together with no constrain and another one equal but constraining all factors loading involving the same indicator to be equal.

## Procedure

Participant recruited for the study had to be older than 16 due to the sensitive data of the survey through Facebook. Using a social network service (SNS) as Facebook with research purposes is a relatively new practice which brings a lot of advantages but also some problems, furthermore, the studies that use this method are not so much widespread (Bull et al., 2011). With the SNSs the recruitment proceed like an accelerated snowball sampling with a very high number of potential respondents reached in a short time and in a very cost efficient way (Baltar & Brunet, 2012).

During the phase one, we posted the advertisement with the link to the questionnaire as a personal message of a profile with 130 friends so that this message appeared into the virtual wall of each friend of the source profile. We posted the same message every 2 days for 11 days. In the phase two, during the $12^{th}$ and $13^{th}$ day, we sent a Facebook's email with a call for the research to every friend of the source profile that had not yet replied to the messages in the virtual wall. In each phase the message contained beyond the link to the questionnaire a call for sharing the message with their own friends using the Facebook's button "share".

The first page that a participant found visiting the link to the survey was the information and agreement form. The respondents at the baseline that left the email at the end of the questionnaire were randomly assigned to the control or experimental group. Chi-square analyses of the sociodemographic characteristics and t-tests for mean differences in risk perception, outcome expectancies, self-efficacy and initial intention revealed no significant differences between the control and experimental group.

The control condition included only the compilation of the two on-line questionnaires whereas the experimental condition comprised also an intervention just before the follow-up. The link to the online questionnaire of the follow-up was sent 1 week after the baseline assessment.

The intervention in the experimental group consisted in a video lasting about 40 sec. shown just before the follow-up assessment in a natural context since it was delivered via web. Two judges selected the video concerning sexually transmitted disease among 123 available on the web. The judges separately evaluated the web videos with a two steps procedure. In the first step the two judges separately evaluated half of the videos each. The videos with at least one characteristic for each elements of Table 1 were selected. In the second step the judges selected the video that best fits the prescription in Table 1 with a consensus procedure.

The selected video showed a chaste sexual scene of a young couple underlined by a slightly anxious music. Parts of human body appear in the foreground: a shoulder, a back together with hands of outsiders, not visible in the first sequence. Meanwhile a voice start saying "Carol sleeps with Mark, Mark has slept with Sandra and Peter, Peter with Ann and Tracy and Susan, Susan with Dave, Steven and Roger." The number of hands increases so much that last image is a chaotic and confused interlacing of men's and women's hands. Then the video blackens and a notice recites: "Your past always sleeps with you". The following image is a blow-up photo of a condom with this subtitle: "Protect yourself in the future" (Solid & Hallerfilm AG, 2005). This video had many of the characteristics of Table 1. The simplicity of the message gave confidence in the honesty and credibility of the source of the message that did not appear as pretending to have a scientific truth or an institutional authority. The indefiniteness of the characters made the identification easy for the audience with an active sexual life. The message had both a rational and emotional appeal with a moderate fear appeal followed by a message that persuaded the audience to be able to face the threat. This last characteristic was the most difficult to find among the videos we examined, fear appeals were usually not followed by messages that persuade the audience to be able to face the threat. Finally, the selected video indirectly recalled the values of individual (sexual) freedom and responsibility that are widespread in contemporary western society.

## RESULTS

According to the HAPA model *H1* predicted that risk perception, outcome expectancies and action self-efficacy are

significant determinants of intention. To verify this we tested the model presented in Figure 2.

We obtained a good fit of the model to the data with $\chi^2(86, N = 196) = 137.21$, $p<.05$; $\chi^2/df = 1.60$, CFI = .97, RMSEA = .050; 90% CI [.031, .068]. All the predictors of intention but *risk perception* had a statistically significant effect on *intention*. This model explained 33% of the variance of *intention to use condoms*, the 25% was explained by *positive outcome expectancies*, the 6% by *negative outcome expectancies* and the 2% by *action self-efficacy*. To understand if the role of risk perception in the behaviour of condom use is truly null and following the statement that risk perception is a sort of antecedent of self-efficacy and outcome expectancies (Schwarzer, 2001) we tested other modified versions of the HAPA model. At the end of this process, we obtained a model equal to the first except for the set of a covariance between *risk perception* and *self-efficacy* (Figure 3). This model showed a good fit to the data $\chi^2(85, N = 196) = 130.43$, $p = .0011$; CFI = .97, RMSEA = .047; 90% CI [.026, .065] with a significant negative correlation between *self-efficacy* and *risk perception* of −.20. Since the first model is nested into the second we compared the two models through the $\Delta\chi^2$ test. This test revealed a $\Delta\chi^2_{(1)} = 6.78$ with a $p<.05$ indicating that removing the correlation between *risk perception* and *self-efficacy* significantly worsens the fit of the model to the data. Given these results, we can sustain that *H1* has not been falsified.

To test *H2* with structural equation modelling we comply with the "group code" approach (Aiken, Stein & Bentler, 1994) which consists in including a dummy variable reflecting group membership in the model. Figure 4 presents the model used for *H2*. The latent variable *Treatment* is the dummy variable with the values of 1 for the non-vision of the video control group- and 2 for the vision of the video -experimental group-. The measurement model was constrained to be equal between the baseline and the follow-up. The overall model resulted in a good fit: $\chi^2(3, N = 196) = 2.14$, $p = .54$; CFI = 1, RMSEA = .0; 90% CI [.0, .11]. The *t* test for the correlation between the error of the *Intention* at the baseline and the *Treatment* was not significant ($\beta = -.13$) meaning that these two factors are uncorrelated and consequently there was not a significant difference between the control and experimental group in terms of level of intention to use condoms at the baseline. This was as expected, given the random assignment to the experimental condition.

*H2* posited a positive effect of the video on the level of intention to use condoms. The path from *Treatment to Intention* at the follow-up was statistically significant ($\beta = .10$) meaning that the vision of the video led to a higher level of intention to use condoms. The model explained 63% of the variance of the intention to use condoms at the follow-up, with the initial intention explaining the majority of the variance of the final intention to use condoms. Therefore, also *H2* were not falsified.

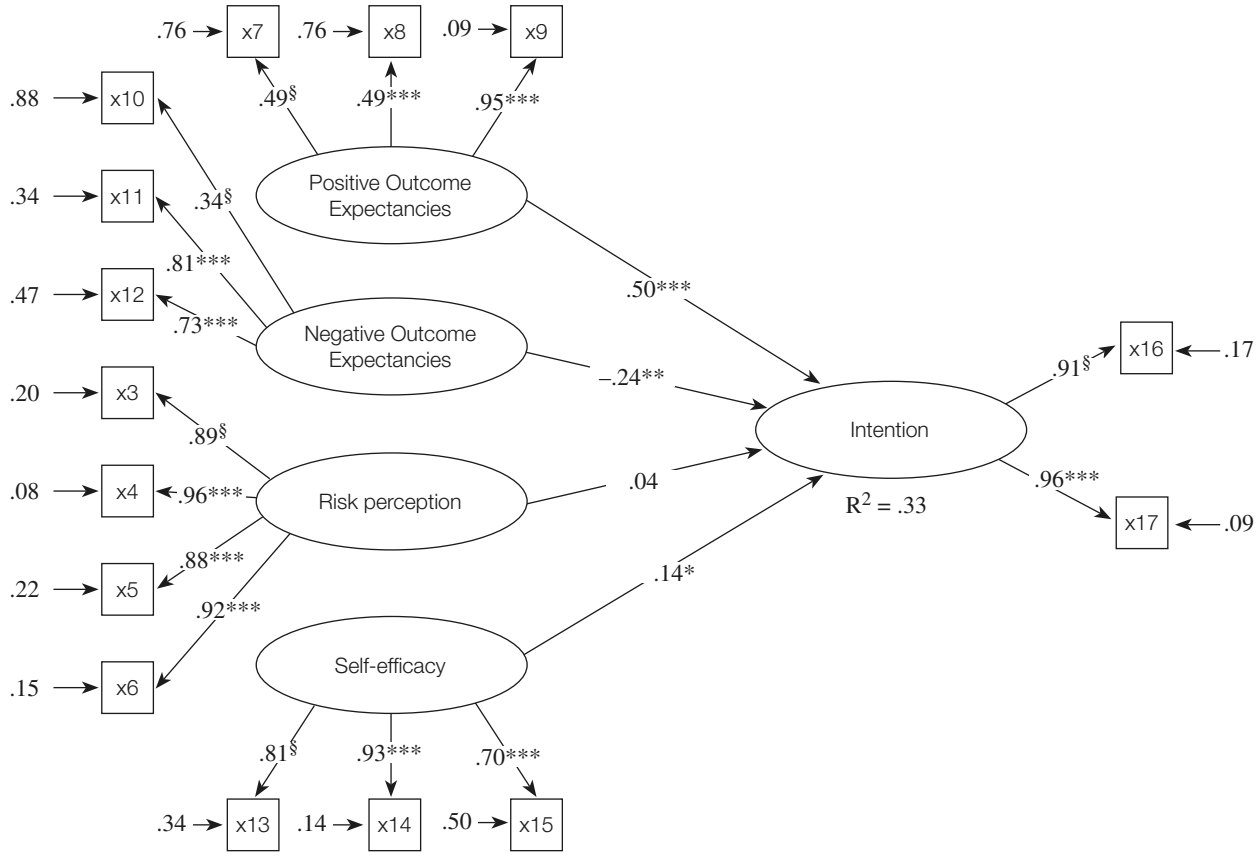
*H3* stated a greater effect of the video for people with a low initial level of intention to use condoms – non-intenders – so we searched for a moderation effect of the initial level of intention on the effect of the video on the final level of intention. Specifically, we expected higher effect of the video at lower levels of initial intention. To test this hypothesis we followed the two-step Ping's approach (1995) which suggests introducing a multiplicative term in the original model after a mean-centring of variables. The model of the second step (Figure 5), the one with the multiplicative term, showed a good fit: $\chi^2(4, N = 196) = 3.702$, $p = .448$; CFI = 1, RMSEA = .0; 90% CI [.0, .104].

The path from the multiplicative term to the intention at the follow-up has a t-value of −1.767 so its statistical significance is $p = .077$, a little bit higher than .05 but still relevant. This indicates that probably there is the hypothesized moderating effect of the initial level of intention. Specifically, the unstandardized regression coefficient is −.77 and its effect on the relation is presented in Figure 6. This plot suggests that the vision of the video results in a higher level of intention to use condoms at the follow-up but this effect decreases until it will disappear with the increase of the initial level of intention. Given the level of significance of the moderating effect *H3* cannot be considered as confirmed but nevertheless as completely rejected.

## DISCUSSION

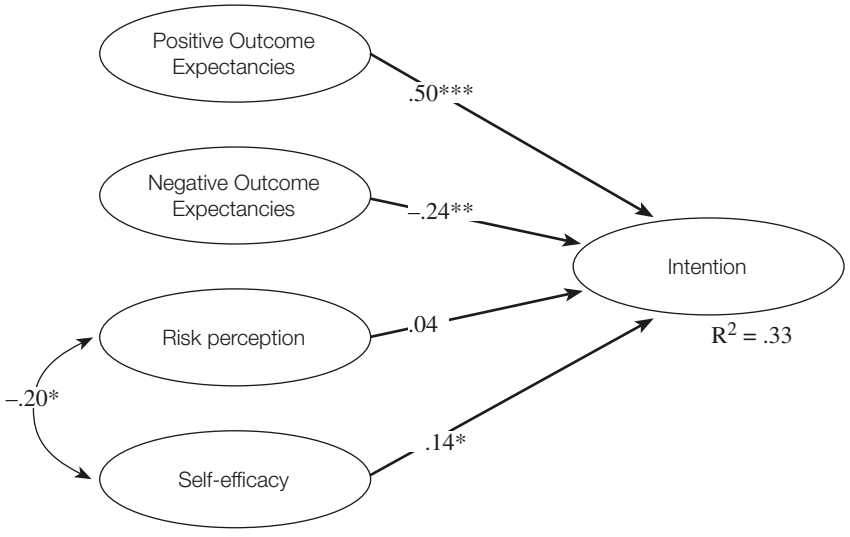
In this study we verified the applicability of the motivational phase of the HAPA model to the behaviour of condom use. For what is our knowledge HAPA model has been applied to the condom use behaviour only with the population of men who have sex with men (Teng & Mak, 2011), male drug user (Tsui, 2010), and recently in the general population but testing in the motivational phase only the outcome expectancies (Carvalho et al., 2015). We tested all the components of the motivational phase of the HAPA in a general population. The model has a good fit to the data

**Figure 2** – Structural equation model of the motivational phase of the HAPA model



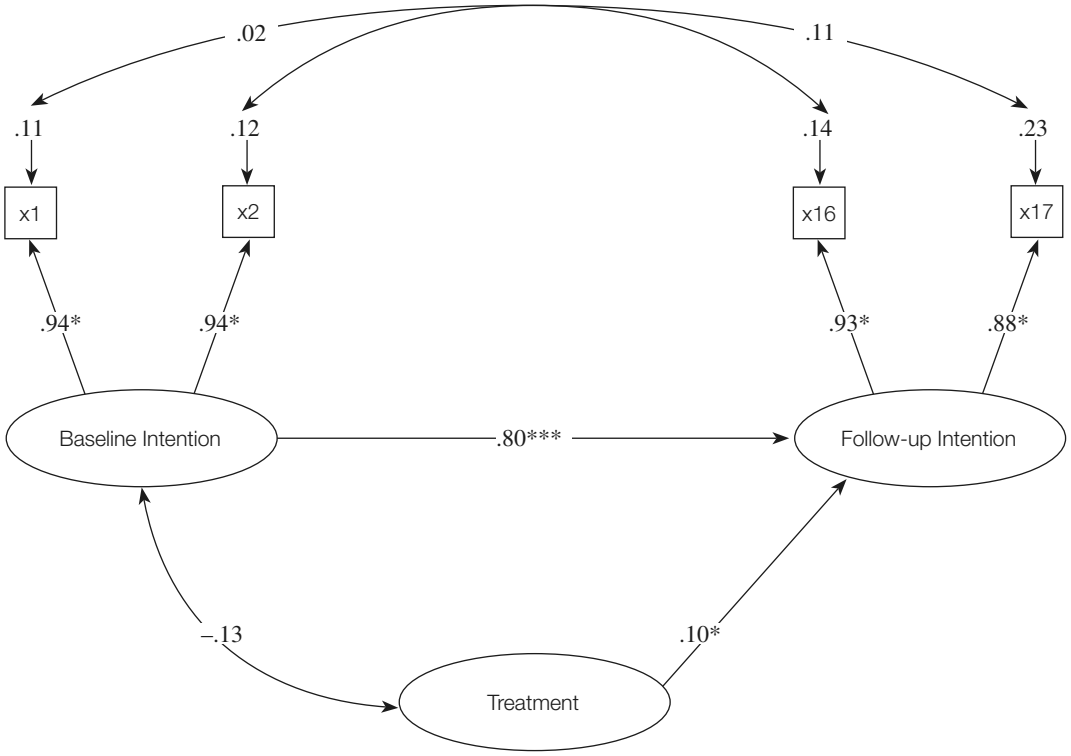

*Note*. * $p<.05$; ** $p<.01$; *** $p<.001$; § = value specified by the researcher

**Figure 3** – Structural equation model of a modified version of the motivational phase of the HAPA model




*Note*. * $p<.05$; ** $p<.01$; *** $p<.001$

**Figure 4** – Model used to test *H2*. All the paths present standardized parameters



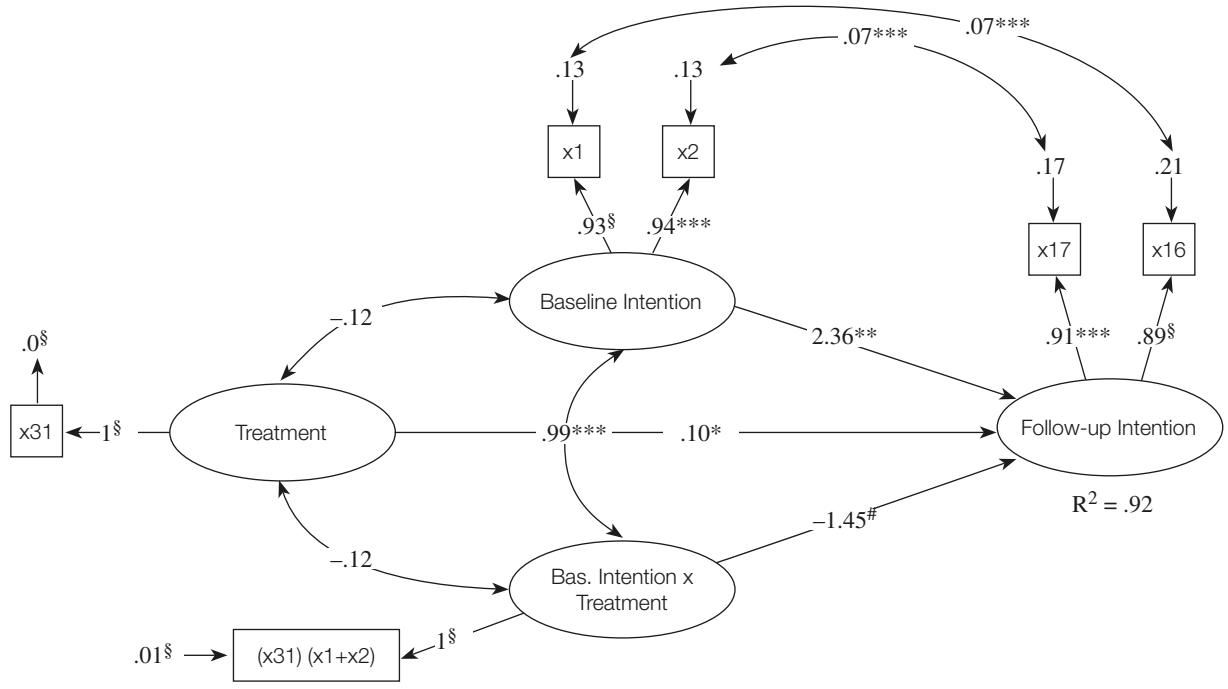

*Note*. * $p<.05$.

and the percentage of variance of intention explained by the model is in line with the one explained in other behaviours (Barg et al., 2012; Payaprom, Bennett, Alabaster & Tantipong, 2011) and by other models of behaviour change (Armitage & Conner, 2001). In line with the result of Carvalho et al. (2015) the crucial aspects that seem to determine if a person has or not the intention to use condoms are the outcome behaviour expectancies and substantially the positive one, accounting for the 25% of the variance of the intention. An intervention aimed at increasing the intention to use condoms should focus its efforts at increasing the positive outcome expectancies of the use of condom and partly at reducing the negative one. In this study, the "classical" role attributed to risk perception on intention in the HAPA model is absent. However, we tested a modified version of the model finding a statistically significant correlation between risk perception and self-efficacy. This could indicate the presence of two mind-sets that are not causally related with the actual intention to use condoms. One characterized by a great perceived ability in the use of condom that may indicate a "confident" approach to the sexual matters predisposing one to feel able to cope with the STI with a low risk perception. The other defined by a perceived difficulties in the management of the condom use that may indicate a "complex" approach to the sexual matters predisposing one to feel at risk of STI with a high risk perception. However, future researches should test this interpretation.

With the second hypothesis, we tested the efficacy of a video delivered via web in increasing the intention to use condoms. Our data supported the possibility to use internet to deliver effective health promotion videos. There is a statistically significant increase in the level of intention due to the vision of the video but the magnitude of this effect is low and the most part of the variance of the intention to use condoms at the follow-up was explained by the initial levels of intention.

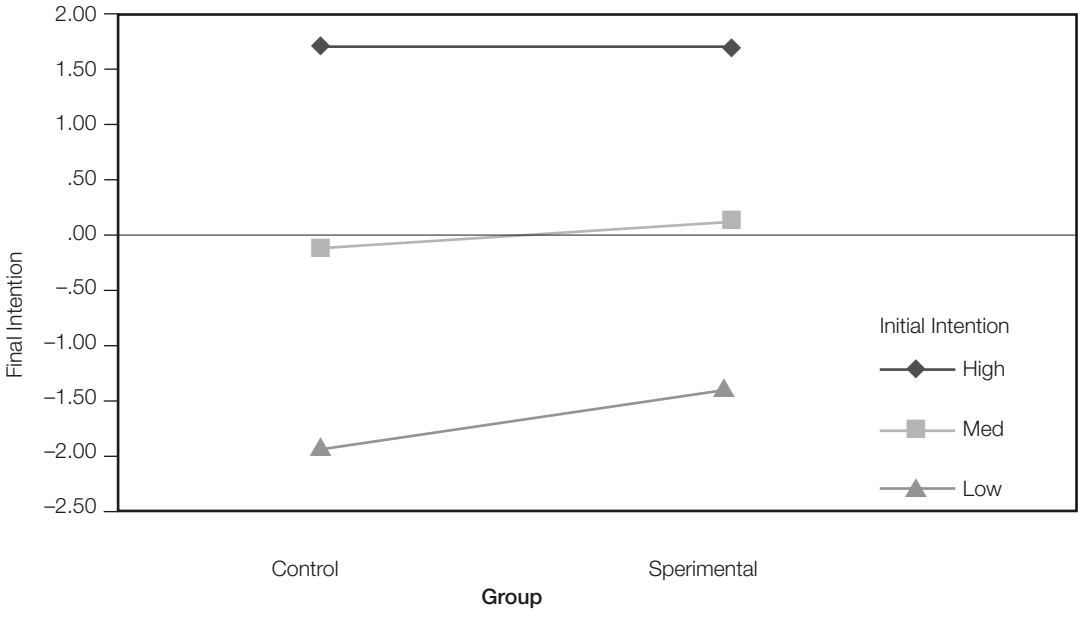
Nevertheless, this result is very important for two reasons. Firstly, the video and the questionnaires were delivered via

**Figure 5** – Model of the second step in the Ping's approach for the moderation of the Treatment on Final Intention by the level of Initial Intention




*Note*. *$p$<.05, ** $p$<.01, *** $p$<.001, #$p$ = .077, § = value specified by the researcher

**Figure 6** – Moderation of the Effect of the Video on Intention by the level of Initial Intention



web and every subject saw the video in their real life setting, not in a laboratory. This means the effect we found accounted for all the situations that can potentially distract the enduser enjoying health-promoting videos through a SNS in his daily life. Secondly, we did not want to demonstrate that a video of 40 seconds is the way to increase the intention to use condoms but that the common use of health promoting videos on the web is a useful and potentially effective practice. However, the small effect clearly indicates that the use of video alone is not enough to produce really impacting health promotion campaigns.

The third and last hypothesis recalls the needs of tailored messages in to produce persuasive messages. The HAPA model state that there is a qualitative difference between people in the motivational stage and the ones in the volitional stage so in order to be effective a health promotion intervention has to be tailored on the stage in which the target population is. That is, if the intervention is aimed at increasing the motivation in the use of condom it will be effective for the people in the motivational stage and useless for the people in the volitional stage. As exposed before the distinction between the two stages is based on the level of intention. A high level of intention place a person in the volitional phase conversely a low level of intention place a person in the motivational phase. We founded a moderator effect of the initial level of intention to use condoms, that corresponds to the phase in which the people are, with a significance of .077. This level of significance is a critical one since it is difficult to refuse the hypothesis of moderation with this figure but at the same time it is not possible to conclude with confidence that moderation does exist. More studies are needed. We consider our data as an indication that moderation does exist. This means that the difference between the control and experimental group for the final level of intention to use condoms is higher for the people in the motivational phase and it decrease until disappearing for the people in the volitional phase. That is, the video is effective only for the people in the motivational phase.

The study presents some limitations that need to be taken into consideration. These are related with the adopted online data collection. Besides the limits of the classic snowball sampling, the use of SNSs leads to a selection bias because the Internet population constitutes a biased sample of the total population (Baltar & Brunet, 2012) and because of the self-selection of participants, the so called "volunteer effect" (Eysenbach & Wyatt, 2002).

In addition, the sample was highly heterogeneous, and this led to the sample being composed of individuals with very different ages, type of relationships and sexual habits. This made it possible to test only general hypothesis about the efficacy of the web video and the fit of the HAPA model but left unsolved a series of interesting issues. For example, it was not possible to compare the efficacy of the web video among specific subpopulations (e.g., young and elderly, homosexual and heterosexual, male and female) or the differential fit of the HAPA model. However, these issues were beyond the initial aims of the present research and the heterogeneity of the sample was also positive. We are more confident that the web video and the motivational phase of the HAPA model are appropriate for a varied population.

## CONCLUSION

This study revealed that persuasive videos promoting healthy sexual behaviours can be effectively delivered via web. However, the video has to be part of a bigger and structured campaign to obtain relevant results.

Our results clearly indicate the applicability of the motivational phase of the HAPA model to the condom use behaviour and it remarks the need of a deeper knowledge about the role of risk perceptions and positive outcome expectations in developing the intention to use condoms. Using the HAPA model as our theoretical framework allowed us to discover the importance of the positive, and to a lesser extent of the negative, expectancies about the use of condom on intention. Without using a behaviour change model these insights would be impossible. As shown by Noar et al. (2009) the greatest progress in the HIV/AIDS mass campaigns during the ten years consisted in a more careful and wider use of the theories of behaviour change during the phase of planning of the campaign. A theoretically embedded campaign presents other advantages beyond a better efficacy. Specifically, a campaigner using a theory as conceptual framework is able to rationally and tidily determine the factors that may determine the behaviour change and consequently design and tailor the best messages. The information that may be inferred from the evaluation of a theory-based campaign is richer than those from a standard campaign. Through a test of the changes in the factors indicated by the theory as determinants of the targeted behaviour it is possible to identify which part of the campaign does or does not work and why (Rothman, 2004).

## References


AIKEN, L.S., STEIN, J.A. & BENTLER, P.M. (1994). Structural equation analyses of clinical subpopulation differences and comparative treatment outcomes: Characterizing the daily lives of drug addicts. *Journal of consulting and clinical psychology*, *62*(3), 488-99.

ALBARRACÍN, D., GILETTE, J.C., EARL, A.N., GLASMAN, L.R., DURANTINI, M.R. & HO, M.H. (2005). A test of major assumptions about behaviour change: A comprehensive look at the effects of passive and active HIV-prevention interventions since the beginning of the epidemic. *Psychological Bulletin*, *131*(6), 856-897.

ANDERSON, R.B. & McMILLON, P.Y. (1995). Effect of similar and diversified modeling on African American women's efficacy expectations and intention to perform breast self-examination. *Health Communication*, 7(4), 324-343.

ARMITAGE, C.J. & CONNER, M. (2001). Efficacy of the theory of planned behaviour: A structured review. *British Journal of Social Psychology*, *40*(4), 471-499.

BĂBAN, A. & CRĂCIUN, C. (2007). Changing healthrisk behaviors: A review of theory and evidence-based interventions in health psychology. *Journal of Cognitive and Behavioral Psychotherapies*, *7*(1), 45-66.

BAGOZZI, R.P. & YI, Y. (2011). Specification, evaluation, and interpretation of structural equation models. *Journal of the Academy of Marketing Science*, *40*(1), 8-34. http://doi.org/10.1007/s11747011-0278-x

BALTAR, F. & BRUNET, I. (2012). Social research 2.0: Virtual snowball sampling method using Facebook. *Internet Research*, *22*(1), 57-74.

BARG, C.J., LATIMER, A.E., POMERY, E., RIVERS, S.E., RENCH, T., PRAPAVESSIS, H. & SALOVEY, P. (2012). Examining predictors of physical activity among inactive middle-aged women: an application of the Health Action Process Approach. *Psychology & health*, *27*(7), 829-845.

BULL, S., BRESLIN, L., WRIGHT, E., BLACK, S., LEVINE, D. & SANTELLI, J. (2011). Case Study: An Ethics Case Study of HIV Prevention Research on Facebook: The Just/Us Study. *Journal of Pediatric Psychology*, *36*(10), 1082-1092.

BURGOON, M., DENNING, V.P. & ROBERTS, L. (2002). Language expectancy theory. In J.E. Dillard & M. Pfau (Eds.), *The persuasion handbook: Developments in theory and practice*. Thousand Oaks: Sage.

CARVALHO, T., ALVAREZ, M.J., BARZ, M. & SCHWARZER, R. (2015). Preparatory behavior for condom use among heterosexual young men: A longitudinal mediation model. *Health Education & Behavior, 42*(1), 92-99.

CENTERS FOR DISEASE CONTROL AND PREVENTION (2009). *Sexually Transmitted Disease Surveillance*, *2008*. Atlanta, GA: U.S. Department of Health and Human Services.

CHAIKEN, S. (1979). Communicator's physical attractiveness and persuasion. *Journal of Personality and Social Psychology*, *37*(8), 1387-1397.

CHEUNG, G. & RENSVOLD, R. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, *9*(2), 233-255.

CORTINA, J.M. (1993). What is coefficient alpha? An examination of theory and applications. *Journal of Applied Psychology*, *78*(1), 98-104.

GILES, H. & STREET, R.L. (1994). Communicator characteristics and behaviour. In M.L. Knapp & G.R. Miller (Eds.), *Handbook of interpersonal communication*. Thousand Oaks: Sage.

GRAHAM, J.M. (2006). Congeneric and (Essential) Tau-Equivalent Estimates of Score Reliability. What They Are and How to Use Them. *Educational and Psychological Measurement*, *66*(6), 930-944.

GRAY, J. & HARRINGTON, N. (2011). Narrative and framing: A test of an integrated message strategy in the exercise context. *Journal of Health Communication*, *16*(3), 264-281.

JÖRESKOG, K. & SÖRBOM, D. (1996). *LISREL 8: User's reference guide*. Chicago: Scientific Software International.

KREBS, P., PROCHASKA, J.O. & ROSSI, J.S. (2010). A meta-analysis of computer-tailored interventions for health behavior change. *Preventive medicine*, *51*(3), 214-221.

LIPPKE, S., SCHWARZER, R., ZIEGELMANN, J.P., SCHOLZ, U. & SCHÜZ, B. (2010). Testing stage-specific effects of a stage-matched intervention: A randomized controlled trial targeting physical exercise and its predictors. *Health Education & Behaviour*, *37*(4), 533-546.

MacCALLUM, R. (1986). Specification searches in covariance structure modeling. *Psychological Bulletin*, *100*(1), 107-120.

McCROSKEY, J.C. & TEVEN, J.J. (1999). Goodwill: A reexamination of the construct and its measurements. *Communication Monographs*, *66*(1), 90-103.

MILLER, A.G., COLLINS, B.E. & BRIEF, D.E. (1995). Perspectives on obedience to authority: The legacy of Milgram experiments. *Journal of Social Issues*, *51*(3), 1-19.

NOAR, M., PALMGREEN, P., CHABOT, M., DOBRANSKY, N. & ZIMMERMAN, R.S. (2009). A 10-year systematic review

of HIV/aids mass communication campaigns: Have we made progress? *Journal of Health Communication*, *14*(1), 15-42.

PAYAPROM, Y., BENNETT, P., ALABASTER, E. & TANTIPONG, H. (2011). Using the Health Action Process Approach and implementation intentions to increase flu vaccine uptake in high risk Thai individuals: A controlled before-after trial. *Health psychology*, *30*(4), 492-500.

PETTY, R.T., WHEELER, S.C. & TORMALA, Z.L. (2003). Persuasion and attitude change. In T. Millon & M.J. Lerner (Eds.), *Handbook of psychology: Vol. 5*. Hoboken: Wiley.

PING, R.A. (1995). A parsimonious estimating technique for interaction and quadratic latent-variables. *Journal of Marketing Research*, *32*(3), 336-347.

PITTS, S.C., WEST, S.G. & TEIN, J.Y. (1996). Longitudinal measurement models in evaluation research: Examining stability and change. *Evaluation and Program Planning*, *19*(4), 333-350.

REYNOLDS, R.A. & REYNOLDS, J.L. (2002). Evidence. In J.E. Dillard & M. Pfau (Eds.), *The persuasion handbook: Developments in theory and practice*. Thousand Oaks: Sage.

RHOADS, K.V.L. & CIALDINI, R.B. (2002). The business of influence: Principles that lead to success in commercial settings. In J.P. Dillard & M. Pfau (Eds.), *The persuasion handbook: Developments in theory and practice*. Thousand Oaks: Sage.

ROBERTO, A.J., ZIMMERMAN, R.S., CARLYLE, K.E. & ABNER, E.L. (2007). A computer-based approach to preventing pregnancy, STD, and HIV in rural adolescents. *Journal of Health Communication*, *12*(1), 53-76.

ROTHMAN, A. (2004). "Is there nothing more practical than a good theory?": Why innovations and advances in health behaviour change will arise if interventions are used to test and refine theory. *International Journal Of Behavioural Nutrition And Physical Activity*, *1*(11), Retrieved from http://www.ijbnpa.org/content/1/1/11

SCHWARZER, R. (2001). Social-Cognitive Factors in Changing Health-Related Behaviours. *Current Directions in Psychological Science*, *10*(2), 47-51.

SCHWARZER, R. (2008). Modeling health behavior change: How to predict and modify the adoption and maintenance of health behaviors. *Applied Psychology*, *57*(1), 1-29.

SCHWARZER, R., LUSZCZYNSKA, A., ZIEGELMANN, J.P., SCHOLZ, U. & LIPPKE, S. (2008). Social-cognitive predictors of physical exercise adherence: Three longitudinal studies in rehabilitation. *Health Psychology*, *27*(1), 54-63.

SCHWARZER, R. & RENNER, B. (2000). Social-cognitive predictors of health behaviour: Action self-efficacy and coping self-efficacy. *Health Psychology*, *19*(5), 487-495.

SCHWARZER, R., SNIEHOTTA, F.F., LIPPKE, S., LUSZCZYNSKA, A., SCHOLZ, U., SCHÜZ, B. et al. (2003). *On the assessment and analysis of variables in the Health Action Process Approach: Conducting an investigation*. Unpublished manuscript, Health Psychology Department, Freie Universeitat Berlin, Berlin, Germany. Retrieved from http://web.fu-berlin.de/gesund/hapa_web.pdf

SOLID & HALLERFILM AG (Producer), (2005). *Zürcher Aids Hilfe - Vergangenheit* [Videofile]. Retrieved from http://www.youtube.com/watch?v=W6BslQ4NZnM

TENG, Y. & MAK, W.S. (2011). The role of planning and self-efficacy in condom use among men who have sex with men: An application of the Health Action Process Approach model. *Health psychology*, *30*(1), 119-128.

TSUI, H.Y. (2010). *Risk perceptions, cognitive behavioural models and hiv-related risk behaviours among non-institutionalized male injecting drug users in china. Dissertation abstracts international*. Retrieved from http://search.barnesandnoble.com/Risk-Perceptions-Cognitive-Behavioural-Modelsand-HIV-related-Risk-Behaviours-among-Non-institutionalized-Male-Injecting-Drug-Users-in-China/Hi-Yi-Tsui/e/9781124497792

UNAIDS (2010). *Global report: UNAIDS report on the global AIDS epidemic 2010*. Joint United Nations Program on AIDS/HIV, Geneva, Switzerland.

UNAIDS (2011). *World AIDS day report 2011*. Joint United Nations Program on AIDS/HIV, Geneva, Switzerland.

UNAIDS (2016). *Fact sheet November 2016*. Joint United Nations Program on AIDS/HIV, Geneva, Switzerland. Retrieved from http://www.unaids.org/sites/default/files/media_asset/UNAIDS_FactSheet_en.pdf

WORLD HEALTH ORGANIZATION (2016). Global health sector strategy on sexually transmitted infections, 2016-2021. Geneva, Switzerland: WHO.