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## Differences in Attitudes About Amphetamine Held by Adolescents Who Do and Do Not Intend to Use the Drug

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Differences in attitudes  
about amphetamine held by  
adolescents who do and do  
not intend to use the drug.

**K. Davies**  
B.A. Hons. (Psychology)  
1995

**Differences in attitudes about amphetamine  
held by adolescents who do and do not intend  
to use the drug.**

**By**

**K. Davies**

**A thesis submitted in partial fulfilment of the requirements  
for the award of**

**B.A. Hons (Psychology)**

**Edith Cowan University**

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## USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

## Abstract

An SEU measure was constructed to test the relationships between adolescents' combined expectations and values of possible outcomes of amphetamine use and intention to use the drug. The structure of the measure was then examined using Principal Components Analysis. Two orthogonal subscales were identified representing desires for the positive outcomes and fears of negative outcomes.

Tukey's HSD analysis of pairwise means indicated that the two subscales were differentially effective in distinguishing participants with high, moderate and low levels of intention to use amphetamine. Participants with high levels of intention differed significantly from participants with low or moderate intention in their responses to items relating to the positive outcomes of amphetamine use. Conversely, participants with low levels of intention differed significantly from participants with high and moderate intention in their responses to items about the negative effects of amphetamine use. From the study, it seems that positive outcomes of use appear to be as powerful a component of utility and as successful in accounting for variance in intention as negative outcomes and that they therefore warrant at least as much consideration in the planning of school-based drug education.

## **Declaration**

I certify that this thesis does not incorporate without acknowledgment, any material previously submitted for a degree or diploma in any institution of higher education; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.

Signature

Date

May 31, 1995

# Table of Contents

Title	Page
Abstract	
Declaration	ii
Use of Theses	iii
List of Tables	v
I INTRODUCTION	1
Amphetamine and related problems	1
Can research be part of the solution?	5
The Australian Government's response	6
Where are the weaknesses in the current strategy?	7
Current views on school-based drug education	8
Back to basics: Rethinking school-based drug education	10
What age groups should receive school-based amphetamine intervention?	12
II REVIEW OF THE LITERATURE	13
Understanding adolescent behaviour: Why do adolescents use drugs?	13
Attitudes	17
Expectancy-Value Utility models	18
Background on the SEU model	22
Construction of SEU measures	24
Indices of drug use	24
Applying SEU to school-based drug education	26
III HYPOTHESIS	29
IV METHOD	30
Sample	30
Procedure	32
Instrument	33
Stage 1: Development of an SEU measure	33
Stage 2: Positives and Negatives subscale development	38
V RESULTS	45
Data preparation	46
Homogeneity of school responses	47
Levels of intention and differences in scale scores	48
VI DISCUSSION	51
VII REFERENCES	56

Appendix



## List of Tables and Figures

Table		Page
1	Comparison of Variables from Problem Behaviour Theory and an SEU Measure for Adolescent Alcohol Use .....	20
2	Demography by Schools .....	31
3	Varimax Rotated Factor Loadings For Utilities .....	41
4	Corrected Item Total Correlations for Factors 1, 2 and 3 .....	43
5	Contents of Negatives and Positives Subscales .....	45
6	Group Means and Standard Deviations for Scales and Schools .....	47
7	The Group Means and Standard Deviations for Scales and High/Moderate/Low Intention Groups .....	50

## Amphetamine and related problems

Amphetamine use is associated with considerable damage to both users and society in general, and yet it is becoming increasingly popular among young people, to the point that Van Litter (1992) said it was clearly Australia's problem drug of the 1990s and Booth Davies (1990) called the 1990s: "The decade of the stimulants".

Amphetamine first became commercially available in the 1930s. Like cocaine, caffeine, and nicotine, amphetamine is a central stimulant drug. Originally developed as a nasal decongestant, it has since been used to medically treat behavioural problems in children, hives, impotence, colic, depression, obesity and narcolepsy. During World War Two it was issued to soldiers to counteract fatigue, elevate mood and increase endurance. After the war, many continued to take the drug in civilian life. This trend escalated and by the late 1960s, chronic high dose use of amphetamine by injection was associated with a serious social, medical and legal problems in several countries. This led to withdrawal of injectible amphetamine from the market and the introduction of stringent restrictions on the use of the drug. Since then, other drugs have risen and fallen in popularity amongst illicit drug users. For example, heroin, which is associated with different patterns of use and different types of problems, was referred to by researchers and health professionals as Australia's problem drug of the 1980s (O'Donovan, 1992).

While drug use by adolescents is not a new phenomena, the growing popularity of amphetamines among adolescents has taken Australian authorities by surprise, as they were expecting a cocaine epidemic. Little research has been conducted specifically into reasons for the current popularity of amphetamine (O'Donovan, 1992). Klee (1992) speculated that the increase in popularity of amphetamine may be a consequence of a prevailing and powerful political philosophy that stresses personal effectiveness, dynamism, confidence and aggressive interaction with the environment. James Pitts, director of Oddessy House, a therapeutic community in N.S.W., suggested that the high availability and relatively low cost of injectible home made amphetamine (compared to the cost of heroin and cocaine) was a significant factor in its rise in popularity, while Dr Greg Cheshire, from Sydney University, said that while amphetamine was more widely available in the 1950s and 1960s than it is now, the proportion of the population who chose to use mind-altering drugs for purely hedonistic reasons seems to have increased (Pitts & Cheshire cited in O'Donovan, 1992). With such disparate explanations being offered, it is clear that there is no real consensus on the issue.

Amphetamine is also topical because of "attention deficit disorder" (ADD), for which it is now prescribed in small doses, to 16,000 Australian school children (Turner, 1995). The US National Institute of Drug Abuse (1985) reported that prescription amphetamine, taken without a physician's orders, had become the fourth

most frequently taken drug amongst U.S. high school seniors, surpassed only by alcohol, tobacco and marijuana.

Problems associated with illicit use of amphetamine arise from its psychoactive effects, addictiveness, potential lack of purity, intravenous mode of administration and cost which can precipitate property crime (Wardlaw, 1983).

Coming from a medical perspective, Dackis and Gold (1990) expressed concerns about the addictiveness of central stimulants. They said that through their actions on powerful endogenous reward centres, central stimulants produced intense euphoria that reinforced subsequent usage and eventual dependence. Also, because addiction is medically defined in terms of withdrawal, and because central stimulants do not produce the dramatic withdrawal symptoms seen with opiates, their addictiveness is often minimised, producing a dangerous misconception that these drugs are safer to use than opiates.

Psycho-social problems associated with amphetamine use include rapid deterioration of users, after about 12 months of regular use, into amphetamine psychosis and/or non-functional lifestyles. This phenomena has been documented by residential treatment agency staff (Lamberti, 1991). In addition, according to Van Littler (1993), the 242% increase in calls associated with amphetamine to the WA Alcohol and Drug Authority Information Service between 1989 and 1992 suggests

that there has been an increase in emotional and social problems associated with the increase in amphetamine use. She reported that many calls came from users and from their families and friends who had witnessed the effects of amphetamine use and who needed help, information and referrals.

Perhaps the most worrying aspect of the current amphetamine trend are reports from survey studies that the most common mode of administration of illicit amphetamine (which is often made in "backyard" laboratories and/or "cut" with other substances) is now injecting (Klee, 1992; O'Donovan, 1992), as opposed to eating or snorting which were more common modes of administration of stimulant drugs in the 1980s. This raises serious concerns because it brings with it problems such as abscesses, thromboses and increased risks of transmission of blood borne infections such as AIDS and Hepatitis B and C. It has also been suggested that amphetamine is more addictive when taken intravenously because tolerance reactions to the drug can not develop as quickly as the rising concentration of the drug in the brain following an intravenous dose (Chesher, 1993). The result is that more intense effects are felt, making the experience more pleasurable and more likely to be sought again.

### Can research be part of the solution?

Most recent research on drug use and related harm has been undertaken in order to influence policy with regard to the legal control of these substances and/or the treatment of people with use related problems (Hawks, Stockwell & Casswell, 1993). But despite this focus, there is still only a tenuous link between academic research and policy formation. While the need for the development of a stronger connection has been clearly stated by a number of researchers and policy makers, hindrances to this process include fears by academics that involvement in politics compromises scientific objectivity (Bell, 1990) and politicians' needs to please their electorates. This can lead to preferences for strategies such as mass media campaigns, which serve political functions by being highly visible shows of concern, even though research evidence indicates that they "had not merely failed to achieve benefit, but could make matters worse" (Bell, 1990).

Despite these obstacles Hawks, Stockwell and Casswell (1993) claim that there is a community of researchers who are committed to strengthening the connection between research and policy. They said it had become evident that the research that had had the most impact on policy was research that was initiated with specific policy issues in mind. Kingdon (1993) echoed this, saying that in order to forge of a stronger connection between research and policy, researchers needed to ensure that the studies they undertook were applicable to the real world and the decisions that needed to be

made. Taking this point, the Australian Government's current policy and recent responses to amphetamine-related problems is foundational to research on amphetamine use in Australia.

#### The Australian Government's response

The Ministerial Council on Drug Strategy approved a National Action Plan on problems associated with amphetamine use in March 1991. The plan included the co-ordination of research into the extent and nature of amphetamine use in Australia, the provision of extra training for health workers, education for drug users and for the wider community and legal initiatives to reduce supply.

This led to: the development of an action plan which included legal sanctions being placed on the chemical ingredients needed to make illicit amphetamine and the allocation of police time and resources to the apprehension of manufacturers; the publication of a clinical manual for general practitioners and training kits for other health workers; and the allocation of funding for research and the upgrading of education and information material, including a mass media campaign called "Speed catches up with you".

While this appears to be comprehensive, evaluation data for the "Speed catches up with you" campaign showed that between February and August 1993, which includes the period over which the three month campaign ran, there was no significant reduction in the number of 15-30 year olds who would accept an offer of amphetamine and 52% of the surveyed individuals said amphetamine had increased in popularity in their own peer groups in the last 12 months (Commonwealth Department of Human Services and Health [CDHSH], 1993). This implies a need to explore other ways of preventing amphetamine use.

Where are the weaknesses in the current strategy?

In a critique of the Australian Government's way of responding to drug problems, former government policy advisory Dr David Bell (1990) said that "by turning to the techniques of marketing research, government has developed an approach which has more in common with the television director or the selling of detergent than the university and the laboratory. Commonly this achieves nothing of practical value to prevent or treat addiction but rather serves to promote an organisation or political party" (p. 221).

The development of the school-based education component of the "Speed catches up with you" campaign is a classic example of an intervention developed via the



techniques of marketing with little or no psychological or empirical rationale. The intervention involved the production of a teachers' kit, containing a set of guidelines for teachers, copies of the television and radio advertisements, posters and brochures.

While Sue Stancombe, Research and Planning Pty Ltd, used marketing-style research in the development of the mass media campaign material, the applicability of this material for classroom use was not researched at all. According to Stancombe, there were insufficient funds available to research or evaluate the school component of the campaign (personal communication, S. Stancombe, April 9, 1995).

With no developmental or evaluative research, there is no way to gauge the efficacy of the school-based component of the "Speed catches up with you" campaign. Although the overall outcome of the campaign, according to its own evaluation study (CDHSH, 1993) was not good, it seems reasonable to expect that a more thoroughly researched, evaluated and developed approach to school-based prevention efforts would be more effective.

#### Current views on school-based drug education

School-based drug education is a politically popular preventative strategy. Calls for more drug use prevention education, especially for young people, are commonly found

in national and international statements of drug use (Blewett, 1987; British Home Office, 1984; World Health Organisation, 1990: cited in O'Connor & Saunders, 1992). However, as O'Connor and Saunders (1992) concluded, despite its popularity, the evidence about the low level of effectiveness of school-based drug use prevention endeavours is compelling in its consistency.

Reviews by Moskowitz (1989) and Bagnall (1991) have indicated that school-based drug education is basically ineffective in changing drug use behaviour. In addition, longitudinal studies by Plant, Peck and Samuel (1985) and Ellickson and Bell (1990) failed to support hopes that the effects of drug use prevention education were latent at the time of initial evaluation and would emerge years later as reduced levels of drug use among former students.

After an extensive review of the area, O'Connor and Saunders (1992) identified five major problems with school-based drug education which they claimed needed to be addressed before any improvement in efficacy could reasonably be expected. These were:

1. A need to acknowledge the positive functions that drug use serves in the lives of many drug users.
2. A need to be aware that knowledge about the negative effects of drug use does not automatically lead to attitude and behaviour change.

3. A need to recognise that school-based drug education can tackle the problem on only one front and that other measures are also needed to complement it.

4. A need to be aware that drug use is a dynamic process which is culturally, environmentally and temporally bound and semantically laden with personal, interpersonal and cultural meanings.

5. A need to use a model that attempts to explain motivational influences at the time of drug use.

#### Back to basics: Rethinking school-based drug education

If one is seeking to assist the development of a well-researched, thoughtful approach to school-based amphetamine resistance education, it seems prudent to consult a number of bodies of literature. These include: research on why people, particularly adolescents, use amphetamines; studies on developmentally normal adolescent behaviour; and, if one accepts that initial drug use is ultimately a volitional act (O'Connor & Saunders, 1992; Davies, 1986), then the literature on decision theory must also be considered. Since little research has directly focussed on reasons for amphetamine use, it is necessary to draw inferences about its aetiology from the general drug literature.

Over the past fifty years, considerable research effort has been devoted to the search for an explanation for non-medical drug use. Over this time, the ongoing failure of a single variable or construct to emerge as a simple linear cause of drug problems has led to the increasingly widespread acceptance of a systemic or holistic explanation of drug using behaviour.

The essence of Systems Theory, as described by Wallack and Holder (1987) and Holder (1989), is the recognition that drug use is engendered by conditions that occur at different levels of the overall social system (such as individual, family, community, and nation). The implication of this view of drug use is that to maximise potential effectiveness, preventive campaigns should simultaneously target factors on different levels of the social system. Wallack and Holder (1987) argue that failure to do this can lead to the promotion of the drug in question on one level, counteracting preventative messages on other levels. In addition, they claim that attempts to improve the efficacy of harm minimisation campaigns should involve a process of widening the sphere of inquiry into the issue and sweeping in more and more variables, in an attempt to intercept as many of the complex, interwoven causal threads as possible.

What age group should receive school-based amphetamine intervention?

The most common age of onset of illicit amphetamine use appears, from prevalence of use data, to be in the mid to late teen years. A survey conducted by Lenton (1993) for the National Campaign Against Drug Abuse (NCADA) found that 20% of West Australians aged between 21-25 have used the drug. This contrasts with Commonwealth data that indicates that only 5-6% of Victorian and NSW 13-15 year olds have used (CDHSH, 1992). While Lamberti's (1991) advice was to interpret these figures with caution because of the inherent fallibility of surveying techniques, they confirm Van Littler's (1992) conclusion that around 15 and 16 years is a common age of onset of amphetamine use. This would suggest that Year Ten, the year in which most Australian adolescents turn 15 is an appropriate time in which to initiate preventative action.

Another reason why Year Ten is probably the most timely point for intervention is that it is prior to the departure from the school system of less academic students, who do not return for upper school studies. As low academic achievement is one of the variables that has been found to be predictive of adolescent problem behaviour (Jessor, 1987), it seems judicious to time interventions so that these students will be included.

## Review of the Literature

### Understanding adolescent behaviour: Why do adolescents use drugs?

Gustafson et al (1994) summarised research on adolescent drug use to date and concluded that while individual variables had been identified that had some predictive power, there was no overall explanatory model and no consensus as to the identification of the key variables from different theories, disciplines or perspectives that relate to each other. While this lack of clarity after many years of effort lends support to a systemic perspective, a number of perspectives on why adolescents use drugs have emerged. These include the views that drug use amongst adolescents is: (a) a functional way of coping with problems; (b) developmentally normal; and/or (c) a pleasurable and social experience. These three views are discussed below.

Baumrind (1985) found that while most adolescents who experimented with drugs such as marijuana desisted from developing more dangerous behaviours, more research was needed into why some progressed to act in more health compromising ways, such as the use of other illicit drugs. In one of relatively few studies that have looked at the differences between antecedents of marijuana and other illicit drug use, Kandel, Kessler and Margulies (1978) found that while marijuana initiation was preceded by peer use and the development of favourable attitudes towards drug use,

onset of other illicit drug (including amphetamine) use was preceded by poor relationships with parents and depression. While their study was comprehensive, involving 8200 public secondary school students in New York State, the data was gathered in 1971 and 1972 and so the result may not reflect current adolescent motivations for drug use.

The work of sociological researchers such as Kandel et al (1978) led to the development of the belief that drug use was mainly a "people problem"; a view that people who used illicit drugs were those with personal or developmental problems, and that drug use was a symptom of these problems (Becker, Agopian & Yeh, 1992), or a form of problem-related self medication (Baumrind, 1985). This concept of drug use in turn led to the creation of school-based interventions aimed at providing young people with higher self esteem and better social skills in an attempt to compensate for their deficiencies and remove the need for self-medication. However evaluation of these programmes indicates that their effectiveness is limited and that their effects do not last long (Becker et al, 1992; O'Connor & Saunders, 1992).

A shortfall of the people problem model is that it assumes that people without problems do not use drugs. This is contrary to what Hardert and Dowd (1994) described as an emerging contemporary "fun morality" or "hedonistic attitude" among young people. Baumrind's (1985) finding that characteristics such as social maturity

and self assertiveness were correlates of early marijuana use is also incongruent with the self medication explanation of adolescent drug use.

Adolescence is a time of accelerated physical and psycho-social development. According to Erikson (1959) "identity formation" is the outcome of a process of experimentation that occurs during adolescence. This experimentation requires adaptive risk taking in order for a range of lifestyle options to be explored and evaluated. Failure to embark on this process results in what Erikson called "foreclosed identity" in which the values of parents and other adult authorities are unquestioningly accepted. According to Baumrind (1985), from a developmental perspective such as Erikson's, adolescent experimentation with substance use is developmentally normal.

Through many years of government-funded research into drug use in America with tens of thousands of adolescent subjects, Richard Jessor constructed a regression model to predict adolescent proneness to socially deviant behaviour such as drug use. His model included 48 variables grouped under the headings: demography; socialisation; personality system; perceived environment system; and behaviour system. Jessor found that the notion of psychosocial proneness, encompassing the risk factors in all of these groups, accounted for approximately 50% of the criterion variance in adolescent problem behaviour (Jessor, 1987).



Jessor (1987) asserted that the most basic tenet of a psychosocial perspective on adolescent drug use is that it is functional, purposive and instrumental towards the attainment of goals (ie: that the behaviour is a rational choice, in accord with the rational models of decision theory). He claimed that functions of drug use that could potentially outweigh negative consequences of use included it being: (a) an instrumental effort to reach otherwise unattainable goals (such as feelings of bliss or self-confidence); (b) a learned way of coping with personal frustrations and anticipated failure; (c) an expression of opposition to/or rejection of conventional society and its laws; (d) a negotiation for, or claim upon, a status transformation (eg: coward to hero) or developmental transition; and/or (e) a demonstration of solidarity with peers or membership of a subculture (Jessor, Jessor & Finney, 1973).

Hardert and Dowd (1994) concluded from the literature that having a "hedonistic attitude" was relatively strongly associated with drug use. They tested this association between hedonism, and alcohol and marijuana use, in a sample of 1234 predominantly white, middle class Arizona high school and college students using a framework drawn from Kandel's (1980) socialisation theory. They found that having a hedonistic attitude more than doubled the odds of marijuana use.

While hedonism was only one of many variables included in their study, it is interesting to note that it supports O'Connor and Saunders' (1992) assertion that

the positive functions of drug use should not be underestimated in the planning of school-based initiatives.

### Attitudes

In a critique of the mass of research seeking to find variables correlated with adolescent drug use, Sutton (1992) concluded that it was not enough to merely identify risk factors. He wrote: "Knowing that being a girl is an independent risk factor ... means that we can, if we wish, target this half of the school population with measures aimed at reducing or postponing the uptake of smoking. What it doesn't tell us is what we should be putting into such programmes" (p. 24). He went on to say that we need to know why more girls than boys take up smoking, and that "with the possible exception of attitudes, the same could be said for most other risk factors" (p. 24). His point is that firstly, it is not really useful to be able to sort statistically problem-prone adolescents out from the others on the basis of variables such as socio-economics, parents' occupations or gender, and secondly, that what is needed is research into attitudes, because this can directly inform intervention planning.

Sutton was using the word "attitude" in the expectancy-value sense of utility theory. In 1987, he reviewed a number of studies exploring the relationship between attitudes or utilities and drug use and concluded that the potential of utility-based

decision-making models as a tool for understanding addictive behaviours was largely untapped (Sutton, 1987).

### Expectancy-Value Utility Models

Subjective Expected Utility (SEU) (Edwards, 1954) is both the progenitor of, and a current leader amongst, expectancy-value models (O'Connor & Saunders, 1992).

SEU questionnaires can elicit information about what possible (plausible or implausible) outcomes adolescents expect to result from drug use and about how strongly they positively or negatively value those possible outcomes. In a series of studies on the ability of SEU questionnaires to explain adolescent behaviour, Karl Bauman and his associates found that SEU consistently contributes significantly to the explanation of variance in drug use (Bauman, Fisher & Koch, 1989). For example: Bauman, Bryan, Fisher and Chenoweth (1984) found correlations between SEU scores and different levels of smoking behaviour a year later ranging from .23 to .50 ( $p < .001$ ,  $N = 1334$ ); and Bauman (1980) found correlations between SEU and levels of marijuana use a year later ranging from .21 ( $p < .05$ ,  $N = 947$ ) to .34 ( $p < .001$ ,  $N = 131$ ).

The main difference between SEU studies and other research on correlates of adolescent drug use is the variables used and the ways that they are measured. Table 1

shows the variables used by Jessor (1987) in a psychosocial (problem behaviour theory) study and Bauman et al (1989) in an SEU study. Both studies were seeking to predict adolescent drinking. The table shows the overlap between the two models. While Jessor's model assesses the importance of academic achievement, independence and affection using an SEU format, the SEU index measures constructs such as the influence of peers by asking for expectancy and value responses to items such as "liked more by best friend". The problem behaviour theory model includes many variables external to the individual while the SEU model only measures subjective perceptions of external variables.

Table 1

**Comparison of Variables from Problem Behaviour Theory and an SEU Measure for Adolescent Alcohol Use**

<b>Problem Behaviour Theory</b>		<b>Subjective Expected Utility (SEU) Expectation and value of:</b>	
value on independence	alienation	feel slightly dizzy	not had example
value on affection	self-esteem	like the taste	be more friendly
independence-achievement value discrepancy	internal-external locus of control	major health problems	cause serious accident
expectation for academic achievement	attitudinal tolerance of deviance	weight gain	enjoy special occasions better
expectation for independence	religiosity	hard time running/walking	good mood
expectation for affection	positive-negative functions discrepancy	pass out	not concentrate as well
social criticism	parental support	sick to stomach	feel hungry
father's education	parental controls	look cool	not do school work
father's occupation	friends support	headache	get even with parents
father's religious group	friends controls	feel more like an adult	feel sad
mother's education	parent-friends compatibility	feel excited	get drunk
mother's occupation	parent-friends influence	spend money	die younger
mother's religious group	parent approval problem behaviour	bad mood	feel strange
Hollingshead Index	friends approval problem behaviour	more relaxed	be ashamed
family structure	friends model problem behaviour	trouble with parents	satisfy curiosity
maternal traditional beliefs	marijuana use	more friends	lose weight
maternal religiosity	sexual intercourse	fewer friends	better health
maternal tolerance of deviance	activist protest	trouble with teacher/principal	look unattractive
paternal traditional beliefs	drinking	feel good	look childish
paternal religiosity	problem drinking	trouble with police	less courage
maternal controls-regulations	general deviant behaviour	be happy	argue/fight less
maternal affectional interaction	multiple problem-behaviour	commit minor crime	feel proud
friend's interests	church attendance	forget problems	enjoy special occasions less
involvement with television	academic performance	more courage	concentrate better
value on academic achievement		argue/fight	less friendly
		tease people	liked more by best friend
		feel guilty	liked less by best friend
		feel nervous about getting caught	less bored
		become alcoholic	

The ability of utility-based questionnaires to generate information that can be used in campaigns aimed at behaviour change is supported by a number of studies. For example, Carter, Beach and Inui (1986) found that a minimal intervention campaign, based on the results of a multi-attribute utility study, succeeded in significantly increasing the number of at-risk patients of an out-patient clinic who presented for influenza vaccinations, where other efforts had failed. (Multi-attribute utility is a statistically-adjusted derivative of SEU)

In as much as educational programmes can be seen as a primary form of treatment, an SEU study, as used in Carter et al's (1986) project, is like the assessment or diagnosis phase of the treatment process. O'Connor and Saunders (1992) stressed the importance of assessing students needs prior to the implementation of educational programs. They said that rather than viewing adolescents as helpless victims of forces they are unable to resist, it was vital to solicit from them information about what they wish to change in their behaviour and to use this information as the basis of the program they receive.

A similar point was made by Baumrind (1985) in an advisory paper for the U.S. National Institute on Drug Abuse. She said that on the basis of research she had conducted and reviewed, educational interventions should focus on both health and social consequences of drug use in an effort to persuade adolescents that it is likely to impair personal attributes that they value. She said it would be counterproductive to

advise adolescents to become more conforming and law abiding, since these were not, in the studies she reviewed, attributes they valued more than pleasure-seeking and peer-approved activities.

### Background on the SEU model

SEU was first brought to psychology from the field of economics by Edwards (1954), who described it as "simple hedonism of the future translated into a theory of choice" (p. 382). The theory holds that every object or action can be viewed in terms of its pleasure or pain giving properties. These properties comprise the "utility" of the object or action. According to the theory, the goal of action and the essence of human motivation, is to seek maximum utility. In the case of risky choices, where the outcome is uncertain, the goal is to seek maximum expected utility, with both likelihoods and levels of pleasure and pain being subjectively defined.

According to the model, both pain reduction and pleasure enhancement are utility maximisation processes. In this sense, SEU theory can mediate both the hedonistic urges of adolescents, evident in studies such as Hardert and Dowd's (1994), and self-medication amongst those with impoverished social or socio-economic backgrounds.

Formally,  $SEU = \text{the sum of (expectancy} \times \text{value) over all possible outcomes}$ . This means that, according to the model, behaviour can be predicted by multiplying scores representing the degree to which possible outcomes are expected by the degree to which they are valued and summing all the products. Along with all utility theories, (of which there are several, each with a slightly different mathematical formula), SEU rests on the assumptions that:

1. People behave "rationally", meaning that even though their behaviour can seem objectively irrational, it is always undertaken in order to maximise some kind of experience of subjective value.
2. People are able to rank sets of choices in order of preference or indifference.
3. This rank ordering is transitive, meaning that if  $A > B$  and  $B > C$  then  $A > C$ .

One of the major criticisms of SEU has been the claim that the process of evaluating the probabilities and values of all possible outcomes is psychologically implausible (Janis & Mann, 1977; Saunders & Allsop, 1989). However, it should be noted that SEU theory does not demand that individuals actually calculate the probabilities and utilities at any level, conscious or unconscious, only that they behave as if they did so. A more plausible utility theory is the "elimination by aspects theory" (Tversky, 1972), which proposes that people decide by first eliminating most of the factors in the decision, making their choice on the basis of only two, three or four possible outcomes. However, because lowly valued factors contribute little to the SEU equation, mathematically the two theories are very similar.



### Construction of SEU measures

In explaining the plausibility of the model, Edwards (1954) said that "assumptions about maximisation of utility [being the essence of human motivation] only become specific, and therefore possibly wrong, when [researchers] specify what is being maximised" (p. 382). Therefore it is crucial in the construction of SEU measures to include as many variables as possible and to be as certain as possible that the variables included are those that are relevant to the subjects' decision making processes. Thus according to Von Winterfeldt and Edwards (1986), the best way to construct an SEU measure is via consultation with research participants.

### Indices of drug use

All studies seeking to understand drug use need an index of that drug use. The two research options available are panel studies that measure correlates of actual drug use and cross sectional designs using measures of either previous use or intention to use. There are advantages and disadvantages associated with each of these strategies.

Bauman et al (1989) and Sutton (1979) both used panel designs to measure the association between SEU at time one and drug use at time two. In discussing the correlations between SEU and actual behaviour, they both speculated that the

correlations may have been stronger had a smaller time lag been used, as SEU may have changed over the period of the study. Thus changes in SEU could have preceded drug use, but not been detected. Gilbert, Bauman and Udry (1986) used a three year time lag panel study to test the development of SEU over time. Using causal modelling, they found that SEU of adolescent sexual behaviour appeared to change in response to early sexual experiences.

A difficulty associated with using previous drug use as an index in school-based research is that there are confidentiality and legal issues associated with asking minors about illicit behaviours.

The third option, using intention as a measure of proneness to drug use, has been widely employed (Ajzen, 1988; Ajzen & Fishbein, 1975). Studies on smoking have found support for the stability of early statements of intention; Sutton (1992) reported on a large scale longitudinal study of U.K. adolescents that found that respondents who (at age 13) said they expected to be smokers (by age 15) were four times as likely to be smokers at 15 than respondents who had said they expected to remain abstinent. Similarly a U.S. National Institute of Education (1979) study found that self prediction by adolescents was the best indicator of smoking status five years later. In a theoretical integration of a number of decisional models, Hays (1985) posited that intention was an appropriate index of future use because it was the most proximal

variable to actual behaviour and it therefore acted as a mediator of almost all other factors (except for more proximal variables such as availability).

However, as O'Connor and Saunders (1992) pointed out, people can intend to abstain but then change their minds in the heat of the moment. This was investigated by Boldero, Moore and Rosenthal (1992) which found a correlation of only .27 ( $N = 223$ ,  $p < .05$ ) between intention to use a condom zero to six weeks prior to a sexual encounter and intention at the beginning of the sexual encounter. Intention was measured using a single direct question with a five point Likert scale response in a questionnaire administered prior to and within 24 hours of a sexual encounter. They posited that the changed intentions were influenced by factors such as degree of sexual arousal and degree of discomfort in discussing or initiating condom use at the time of the sexual encounter. The researchers concluded that while intention (in action) was a significant indicator of behaviour, it also varied over time and was a better predictor the more temporally proximal the behaviour was to the measure of intention.

#### Applying SEU to school-based drug education

The "Speed catches up with you" campaign was consistent with the SEU model in that it sought to increase perceptions of the negative consequences of amphetamine

use, thereby lowering the overall utility and supposedly reducing the likelihood of use. While many other intervention efforts have also used this approach, there is little evidence of it being successful. Bruvold (1990) and Bangert-Drowns (1988) both conducted meta-analyses of school-based substance abuse education programmes and concluded that while programmes that sought to enhance fear of negative consequences of drug use were often associated with increases in student's knowledge about drug-related harm, their effect on drug use behaviour was negligible. This could be because there are benefits of drug use that outweigh even interventionally-enhanced awareness of negative consequences.

According to the SEU formula (Edwards, 1954), no matter how strong the expectations of pleasure associated with drug use, it is possible for them to be outweighed by stronger levels of perception of negative consequences, and therefore fear generating campaigns are justifiable. This is the point at which Janis and Mann (1977) and O'Connor and Saunders (1992) take exception to the model and claim that when a person simultaneously strongly desires the positive consequences of a behaviour and strongly fears the negative consequences, they experience cognitive dissonance (Festinger, 1957) and their decision making behaviour becomes "hot", erratic and impulsive. This idea is similar to Lewin's (1948) concept of approach-avoidance conflict, which he posited arose when a goal had simultaneous positive and negative aspects. According to Lewin, people aware of positive and

negative outcomes of a behaviour become fixed in a cycle of vacillation, moving towards and away from the act.

If raising awareness of negative effects amongst students who have awareness of positive effects does not lead to a simple lowering of utility, but rather to confusions and inner conflict then it is not surprising that school-based interventions that have only focussed on increasing fears of negative consequences have not performed well. Reasons why amphetamine use could have positive utility for some adolescents include the issues raised by Jessor et al (1973), such as it being a way to achieve otherwise unreachable goals, a coping mechanism, an expression of opposition to authorities or a communication with peers. Or as Chesher (1993) posits, it could simply be the drug's euphoric psychoactive effect that attracts users.

Merging Janis and Mann's (1977) concept of hot decision making with SEU, it seems that school-based education would be more effective if it simultaneously sought to reduce students' utilities of the positive and negative outcomes of drug use, as this would decrease rather than increase cognitive dissonance and perhaps make decision making less erratic. In order to establish the validity of this concept, it is necessary to empirically determine whether desire for positive effects and fear of negative effects are independent constructs or whether increases in fear automatically lead to reduced desire for positive effects.

In addition, it would be useful to know about the nature of the relationship between high levels of fear of negative consequences of amphetamine use, high levels of desire for the positive effects of use, and intention to use the drug. If fear is found to be a better predictor of intention than desire for positive effects, then the current national strategy will be theoretically supported, but if different levels of desire for positive effects predict intention better, it would seem that other strategies may be more applicable.

### Hypothesis

The objectives of the research were twofold, the first objective was to develop an SEU measure applicable to adolescent amphetamine use. It is hypothesised that examination of the structure of the measure would reveal a number of subscales such as fear of negative outcomes and desire for positive outcomes. The second objective was to examine the relationship between the subscales and intention to use amphetamine.

## Method

### Sample

The entire Year Ten populations of three metropolitan high schools were surveyed. The schools were selected to participate because of their large student bodies and on the basis of prior contact with Palmerston Drug Rehabilitation Association, which provided otherwise unavailable access to them. Table 2 shows a breakdown of the gender mix and ethnicity of participants from the three schools.

Table 2

Demography by Schools

School	A		B		C	
	N	%	N	%	N	%
Male	63	49.6	94	55.6	85	45.4
Female	64	50.4	75	44.4	102	54.5
Born in Australia	88	69.3	122	72.2	139	74.3
Born Elsewhere	39	30.7	47	27.8	48	25.6
Speak English at Home	99	78	145	85.8	167	89.3
Non-English Speaking Home	12	9.4	9	5.3	5	2.6
Family Bilingual - inc English	16	12.6	15	8.9	15	8.1
Age - 13	-	-	1	.6	1	.5
- 14	73	57.5	95	56.2	96	51.3
- 15	54	42.5	68	40.3	87	46.6
- 16	-	-	5	2.9	3	1.6
Incomplete questionnaires	9	5.4	7	3.9	17	7.8
Honesty scores:						
1. completely honest	88	53	132	74.1	131	60.7
2.	39	23.5	37	20.8	56	25.9
3.	14	8.4	1	.6	3	1.5
4. not at all honest	12	7.3	1	.6	7	3.2
Declined to participate	4	2.4	0	0	2	.9
Total students	166	100	178	100	216	100
Complete questionnaires	127	76.5	169	94.9	187	86.6

The principals of all three schools described their school catchment areas as predominantly middle class. Students in all three schools had received drug education from the K-10 state health syllabus. They all had access to information about drug use from nurses based in the schools. Students from Schools A and B had been addressed by annual visiting speakers from drug treatment agencies and staff at School B had attended a workshop given by a Palmerston DRRA.



## Procedure

Participants were addressed in their school classrooms by the researcher who was unknown to them. They were told that the study was an investigation of adolescents' knowledge and attitudes about the drug amphetamine. They were told some of the "street names" for amphetamine and for other illicit drugs available in Perth to help them clarify what they were and were not being asked about.

It was stressed that participants names were not required, that information on individual people was not being gathered and it therefore could not be handed on to other authorities. This procedure, also used by Bauman et al (1989), was expected to increase the honesty of participants' responses and the validity of the study. According to Needle, Jou and Su (1989), assuring participants' anonymity and confidentiality contributes to the reliability of adolescent self disclosure about illicit drug use.

Students were reminded of their right to not participate. However, non-participating students were asked to wait quietly in the room so that participation was not seen as an undesirable alternative to recreation outside. Participating students were asked to answer all questions. Participants were then given the questionnaire and asked to complete it and post it into a sealed box which they were assured would not be opened on the school premises. The questionnaires took 10-15 minutes to complete.

After the questionnaires had been completed, the students were given the opportunity to ask questions arising from it in the classroom and in private during school recess.

### Instrument

An SEU questionnaire was constructed using processes of consultation of recent research literature, current participants in amphetamine use and pilot testing. It was then administered to School A. Principal components analysis and reliability analysis were then used to develop subscales of utility of positive and negative effects.

#### Stage 1: Development of an SEU measure.

Firstly 25 possible outcomes of amphetamine use were drawn from National Campaign Against Drug Abuse documents (Wickes, 1992; Butrows, Flaherty & MacAvoy, 1993). These documents reported the results of recent studies on amphetamine use and its effects gathered via consultation with practitioners and researchers in the field of drug treatment.

The list was then shown to a group of current young amphetamine users who attend Adelaide's Needle Exchange Programme and to a treatment group for adolescent amphetamine users in Perth. Both groups were asked:

1. Which if any items were completely irrelevant to young people's decisions to use amphetamine.
2. If there were any reasons why young people either did or didn't use amphetamine that were not on the list.

The two youth groups both responded that more positive outcomes should be included, especially immediate bodily sensations, such as "buzzing" and "feeling wicked". "Buzzing with energy", "bliss", "feeling more attractive than usual", "feeling confident" and "being able to dance all night" were added to the list, but "feeling wicked" was not, because its meaning is paradoxical and could be confusing. The youth groups also said that mild unpleasant side effects, such as shaking and vomiting, were irrelevant to their decisions to use.

The list was then written into an SEU questionnaire, using a similar style to Bauman et al's (1984, 1989). While some SEU studies (Sutton, 1979, Mausner & Platt, 1971) have asked subjects to assess the utilities of two different courses of action (to facilitate prediction of which course of action will be taken), this study followed Bauman et al (1984) and only asked for the SEU of use because, as Sutton

(1987) noted in discussing Bauman's work, to ask for the utility of using versus not using would make the questionnaire impractically long.

The draft questionnaire was then administered to 40 students aged between 13 and 17 (20 male, 20 female) at a small high school in Perth.

Tests of multicollinearity (Spearman correlation coefficients) on the pilot test data showed that the items "getting a criminal record", "getting fined" and "going to prison" and getting "AIDS", "Hepatitis C" and "blood poisoning" elicited almost identical responses and could be seen as different ways of asking the same question. Consequently, these clusters were combined into the single items "getting caught by the police" and "getting AIDS, Hepatitis C and/or blood poisoning".

Pilot test subjects were also asked if there were any other possible outcomes of amphetamine use that influenced their decisions either to use or not to use. Issues that were raised were: the sour taste of amphetamine; the financial cost of amphetamine; fun; the negative effect of amphetamine use on friendships and relationships; the boringness of drug use; and beliefs that amphetamine use caused stomach ulcers and bone softening.

"Being bored" and "experiencing a sour taste" were added to the list, financial costs, fun and relationship costs were already included and the final two concerns

(ulcers and bone softening) were not included. This was because including them could be construed as propagation of false information about amphetamine use. However, the item "other negative health effects" was included so that fears such as these would be part of the SEU measure.

In order to reduce the length of the questionnaire (and increase the subject-to-variable ratio for Stage 2), it was necessary to eliminate some of the expected outcomes on the list. Consistent with earlier studies (Fishbein & Ajzen, 1975; Gilbert et al, 1986), this was done by deleting from the pilot test list the nine items with the lowest utility scores (derived by multiplying the expectancy and value scores). In other words, eliminating items that were lowly expected and neutrally valued. The deleted items were: "shaking"; "fainting"; "vomiting"; "tension"; "nausea"; "paranoia"; "feeling hungry"; "feeling talkative"; and "being suspended from school". This process confirmed the youth groups' assertion that mild physical effects were irrelevant to adolescents' decisions to use amphetamine.

The final form of the questionnaire had 20 possible outcomes (see Table 2) which subjects were asked to rate in terms of both expectancy and value. This compares with Bauman et al's (1989) use of 57 possible outcomes, Mausner and Platt's (1971) 40 and Gilbert, Bauman and Udry's (1986) 20.

Participants were asked to rate the likelihoods and values of the possible outcomes on five point Likert scales. The expectancy Likert scale points were labelled: A = very unlikely to happen; B = unlikely but could happen; C = unsure; D = quite likely to happen; and E = almost certain to happen. The value scale was labelled: -2 = lots of damage; -1 = some damage; 0 = no effect; 1 = some good; and 2 = lots of good.

Alphabetic characters were used with the expectancy items as it reduced confusion with the early item numbers and negative and positive numbers were used with the value items to emphasise that values could be negative, neutral or positive. Other SEU questionnaires that have use five point Likert scales include Bauman et al (1984, 1989) and Gilbert et al (1986).

An honesty item was included in the questionnaire. The participants were asked to rate their own honesty on a four point scale (labelled from 1 = completely honest to 4 = not at all honest). Of the 40 pilot test subjects, five reported that their responses had not been honest and of these three were also multivariate outliers. Honesty rates for the main study are reported in Table 2.

Intention to use was measured on an 8 cm long Visual Analogue Scale (Folstein & Luria, 1973) labelled "I will never use amphetamine" at one end and "I will certainly use amphetamine" at the other. Responses were measured in millimetres giving each subject an intention score between 0-80. In an attempt to avoid confounding because of varying degrees of availability of amphetamine which could affect perceived likelihood of use (Ajzen & Madden, 1986), participants were asked how likely they it was that they would use amphetamine, if it was offered to them, thereby presupposing ease of availability for all subjects. Boldero et al (1992) also used a single item measure of intention in their study on attitudes and condom use.

Subjects were also asked for their age, gender, and cultural background (country of birth and languages spoken at home) in order to provide some indication of the degree of cultural homogeneity between the schools (see Table 2).

#### Stage 2: Positives and Negatives subscale development

Principal Components Analysis (PCA) and Cronbach's alpha reliability analysis were used to construct and test the internal reliability of subscales drawn from the SEU measure using data from School A.

Expectancy items were coded a = 1, b = 2, c = 3, d = 4, e = 5. Value items were coded -2, -1, 0, 1, 2, as they appeared on the questionnaires. The nine incomplete

questionnaires and the 26 questionnaires marked as "3" or "4" on the honesty scale, indicating self-disclosed dishonesty were not coded. This left 127 complete cases.

Expectancy and value scores for School A data were multiplied to form 20 utility scores. As this represented a subject-to-variable ratio of only just in excess of six to one, Bartlett's test of sphericity was used to test the factorability of the data, as recommended by Tabachnick and Fidell (1989). The result was a Bartlett's sphericity score of 1139.92 ( $p = .000$ ) indicating that PCA was appropriate. In addition, the Kaiser-Meyer-Olkin measure of sampling adequacy was used to confirm factorability and the score of .85 for the data was in the range that Kaiser (1974, p. 35) described as meritorious and was well in excess of the .60 recommended as a minimum level for good factor analysis by Tabachnick and Fidell (1989, p. 604).

The utility scores were then screened for univariate outliers using z-scores and multivariate outliers using Mahalanobis distances. There were no significant outliers at levels recommended by Tabachnick and Fiddell (1989).

A scree plot was produced and interpreted as recommended by Tabachnick and Fidell (1989) by looking for the point at which the plot of eigenvalues changes direction. the plot it indicated that there were three main factors in the data. A three-factor solution to PCA was then generated with varimax rotation. The three factors cumulatively accounted for 54.4% of the variance. The factor loadings,



communalities ( $h^2$ ), and percentages of variance explained are shown in Table 3.

Factor loadings less than .30 have been suppressed to aid interpretation.

As can be seen from Table 3, variables loading in Factor 1 seemed to include most of the harmful consequences of amphetamine use, while the second factor is comprised of the more positive possible outcomes. These two factors were labelled Negatives and Positives. The third factor was less conceptually cohesive, comprising of "being bored", "having no money for other things", "being good at sports" and "studying well".

Table 3

Varimax Rotated Factor Loadings For Utilities

Utilities	1 (-ves)	2 (+ves)	3	$h^2$
Having an accident	.82			.68
Being aggressive	.73			.57
Getting AIDS...	.82			.69
Feeling attractive		.68		.49
Bliss		.79		.63
Feeling bored			.64	.48
Buzzing with energy		.65		.42
Feeling confident		.71		.54
Dancing all night		.69		.48
Feeling depressed	.70			.53
Forgetting problems		.68		.52
Other negative health effects	.77			.62
Having a mental breakdown	.77			.62
No money for other things	.38			.48
Being caught by the police	.86			.75
Becoming a regular user	.83			.69
Seeing things differently		.63		.51
Having a sour taste	.47			.24
Being good at sports		.44	.57	.52
Studying well			.61	.41
% of variance	29.6	8.3	6.4	

The internal consistency of the factors was then examined using Cronbach's alpha.

The alpha coefficients obtained were .91 for the negatives factor, .84 for the positives factor and .52 for the third factor.

Table 4 shows the corrected item-total correlations for the three factors. The corrected item-total correlations for the negatives factor ranged from .41 to .80, except for having no money for other things, which had an item-total correlation of .38. Corrected item-total correlations for the positives factor ranged from .43 to .66.

For the third factor, the corrected item-total correlations ranged from .29 to .34. On the basis of this low level of inter-item correlation, the relatively low alpha score (.52) and the conceptual inconsistency of the items, the reliability of the third factor was considered to be questionable and a two-factor solution to the principal components analysis was generated.

Table 4

Corrected Item Total Correlations for Factors 1, 2 and 3

Utilities	1 (-ves)	2 (+ves)	3
Having an accident	.75		
Being aggressive	.68		
Getting AIDS...	.76		
Feeling attractive		.60	
Bliss		.66	
Feeling bored			.29
Buzzing with energy		.49	
Feeling confident		.60	
Dancing all night		.55	
Feeling depressed	.62		
Forgetting problems		.60	
Other negative health effects	.72		
Having a mental breakdown	.72		
No money for other things	.37		0.38
Being caught by the police	.80		
Becoming a regular user	.76		
Seeing things differently		.55	
Having a sour taste	.41		
Being good at sports		.43	.34
Studying well			.23
Alpha	.91	.83	.52
Standardised Alpha	.90	.83	.52

In the two-factor PCA, two of the four utility items initially in the third factor fell into the negatives factor and two fell into the positives factor.

The two items in the negatives factor were "having no money for other things" and "being bored". "Having no money" had appeared in the negatives factor in the initial PCA with a corrected item-total correlation of .37, and in the two-factor PCA this improved to .41. "Being bored", which was not initially in the factor, had an item total score of .29 in the two-factor solution. As this was lower than the critical limit of .30 recommended by Boyle (1991), it was excluded from the scale.

The two third factor items that fell into the positives factor were "being good at sports" and "studying well". Sports had been in the positives factor in the first PCA with a corrected item-total correlation of .43, in the two-factor PCA this improved to .48. "Studying well", which was not initially in the factor, had an item total score of .24 in the two-factor solution, again this was lower than .30 and it was therefore not included (Boyle, 1991).

The result of this process was Negatives scale comprising of ten items with an alpha score of .91 and Positives scale made up of eight items with an alpha score of .84 (see Table 5 for items included in each scale).

Table 5

Contents of Negatives and Positives Subscales

Negatives	Positives
Having an accident	Feeling attractive
Feeling aggressive	Feeling bliss or euphoria
AIDS, Hepatitis or blood poisoning	Buzzing with energy
Feeling down or depressed	Feeling confident
Having other health problems	Being able to dance all night
Having a mental breakdown	Forgetting problems
Having no money for other things	Seeing things in a different way
Being caught by the police	Being good at sports
Becoming a regular user	
Having a sour taste	

## Results

The positives and negatives scales developed from the School A data were then used in the analysis of data from Schools B and C. Scores for the two scales were generated for participants from Schools B and C by summing their utility scores for the items comprising the scales. The correlation of the scales was close to zero [ $r(353) = -.07, p = .13$ ] confirming their orthogonality.

Differences between Schools B and C on the two scales were assessed using discriminant function analysis. A second discriminant function analysis, with contrasts analysis, was then performed to test the ability of scores on the positives and negatives scales to predict levels of intention to use amphetamine. As with the School A data, the 24 incomplete questionnaires and 12 self-identified dishonest questionnaires were not coded, leaving 169 complete cases from School B and 187 complete cases from School C.

#### Data preparation

Utility scores were generated and screened for univariate outliers using z-scores. Mahalanobis distances were used to screen for multivariate outliers. There were no scores more than three standard deviations away from the mean in the z-score screening and it was therefore concluded that there were no univariate outliers (Tabachnick & Fidell, 1989). One case from School C with an intention level of 46/80 was identified as a multivariate outlier at  $p > .001$ . Examination of the questionnaire showed that the participant had marked all of the value items "2" (meaning "lots of good"), suggesting that he had used a response set, rather than considering each item. As he was the only multivariate outlier identified, he was excluded from the data set.

### Homogeneity of school responses

Homogeneity of responses from participants from Schools B and C were tested using discriminant function analysis, for which the canonical discriminant function was significant [ $X^2 (2, N = 355) = 6.48, p = .04$ ]. Table 6 shows group means and standard deviations for scales and schools. According to the Wilks' Lambda U-statistic and univariate F-ratio, the difference between the schools on the negative effects scale was significant ( $F = 4.77, p = .03$ ), while the difference between the schools on the positive effects scale was not. School B had significantly more negative utility of negative effects than School C.

Table 6

### Group Means and Standard Deviations for Scales and Schools

		Negatives Scale	Positives Scale
School B	<u>M</u> <u>SD</u>	-52.46 21.66	13.80 20.06
School C	<u>M</u> <u>SD</u>	-46.68 27.42	10.46 21.27



### Levels of intention and differences in scale scores

A multiple regression analysis found the Negatives and the Positives scales together were correlated with intention at .42. [ $r(353) = .42$ ]. Regressed separately against intention, the Positives scale had a correlation of .30 and the Negatives scale had a correlation of .27. SEU scores were calculated by summing the utilities of all 20 possible outcomes. The correlation of overall SEU with intention was .42, (the same as the correlation between the two scales and intention), indicating that no predictive power was lost via the deletion of "being bored" and "studying well".

However, some caution is required in interpreting the regression analyses, because the intention data was skewed. While the distribution of intention scores is what one would expect for a behaviour that, on the basis of current prevalence data, only 20% of the population are expected to perform (Lenton, 1993). It restricts the range of optimal analysis strategies for the data to those tolerant of abnormal distributions within variables. According to Tabachnick and Fidell (1989), no special problems are posed by unequal cell sizes for discriminant function analysis.

In order to conduct discriminant function analysis, participants from Schools B and C ( $N = 355$ , excluding the outlier) were assigned to three intention groups on the basis of responses to the intention item. The first group included the 272 participants whose responses ranged from 0-26, the second group included the 57 participants with

scores from 27-53 and the third group included the 26 participants with scores ranging from 54-80. While the cell sizes are extremely uneven, this division of scores makes logical sense on the basis of the face validity of the visual analogue scale (Folstein & Luria, 1973). Evaluation of assumptions of homogeneity of variance (Levene's test = 1.9,  $p = .15$ ) and equivalence of variance/covariance matrices (Box's M = 7.8,  $p = .26$ ) revealed no threat to multivariate analysis.

A direct discriminant function analysis was performed using the negatives and positives scales as predictors of the three intention groups. It can be seen from the group means in Table 7 and Figure 1 that the low intention group had lower utility of items in the negatives scale than cases in the moderate and high intention groups. The high intention group conversely had higher utility of items in the positives scale.

Two discriminant functions were calculated, with a combined  $[X^2(4, N = 355) = 64.3, p = .000]$ . After removal of the first function, there was still a strong association between groups and predictors  $[X^2(3, N = 355) = 9.99, p = .002]$ . The two discriminant functions accounted for 85.3% and 14.7%, respectively of the between group variability. The positives scale had a loading on the first function of .73 and the negatives scale had a loading on the second function of .82. Both these correlations are in the range described by Comrey (1973, cited in Tabachnick & Fidell, 1989, p. 640) as excellent, as they indicate more than 50% overlapping variance.

Table 7

The Group Means and Standard Deviations for Scales and High/Moderate/Low Intention Groups

		Negatives Scale	Positives Scale
Low Intent (N = 26)	<u>M</u> <u>SD</u>	-52.84 23.20	9.65 19.59
Moderate Intent (N = 57)	<u>M</u> <u>SD</u>	-36.00 27.47	13.93 21.04
High Intent (N = 272)	<u>M</u> <u>SD</u>	-39.50 31.93	33.85 19.51

Finally, Tukey's post-hoc comparisons of pairwise means ( $\alpha = .05$ ) was used to determine if either or both of the scales reliably separated one or more of the intention groups from the others. The result was that scores on the positives scale significantly distinguished participants in the high intention group from those in both the low and moderate intention groups, while they were not able to significantly distinguish low and moderate intenders from each other. Conversely scores on the negatives scale distinguished participants in the low intention group from those in both the moderate and high intention groups, while not being able to significantly distinguish moderate and high intenders from each other.

## Discussion

The principal objective of the research was to develop an SEU measure applicable to adolescent amphetamine use. This was done using a process of consultation with stakeholders as recommended by Von Winterfeldt and Edwards (1986). The result was a measure significantly correlated [ $r(355) = .42, p = .000$ ] with intention to use amphetamine to a degree comparable with Bauman et al's (1989) SEU and smoking behaviour correlations of .23 to .50.

The structure of the SEU measure, examined using PCA and Cronbach's Alpha reliability analysis, supported the hypothesis that fear of negative consequences and desire for positive effects of amphetamine use are independent constructs of equal consequence in the prediction of intention to use. The lack of correlation between the two scales [ $r(353) = -.07, p = .13$ ] suggests that while increasing individuals' fear of the negative consequences decreases the overall utility of amphetamine use, it does not correspond with reductions in the expectancies and values placed on the positive consequences.

The separation of the SEU measure into two subscales, utility of positive effects and utility of negative effects, allowed the comparative ability of the two subscales to predict intention to use to be tested. Tukey's HSD analysis ( $\alpha = .05$ ) showed that

the two subscales are related to intention in different ways. Utility of the positive effects distinguished high intenders from moderate and low intenders, while utility of the negative effects distinguished the low intenders from the other two groups.

This finding implies that while high intenders are as aware of the negative effects as the moderate intenders, they expect and value the positive outcomes more. This lends support to O'Connor and Saunders' (1992) assertion that school-based drug education needs to acknowledge the positive functions that drug use serves in the lives of many drug users. The result implies a need for inventiveness in planning interventions aimed at high intenders in order to communicate that positive effects are either unlikely to occur as a result of amphetamine use or that they could be better achieved by other means. Examples of strategies that could be part of such efforts include satisfying adolescents' desires to experience bliss and buzzing through activities such as religion, sport or abseiling. The need to see things in a different way might be met through philosophical or political discussion groups; and needs for attractiveness and confidence might be addressed through counselling or deportment and drama classes.

The significant difference in utility of the negative items held by participants from School B, (who had been addressed by four speakers in the previous two years and whose teachers had attended a staff development workshop, in addition to being taught from the state health syllabus), and those from School C, (who have had drug education only in the form of the health syllabus including some drug education),

indicates that recent interventions may have lowered utility of negative items.

However, more deliberate control of interschool differences is needed to establish the degree to which the difference between School B and School C's utility of negative effects can be ascribed to interventions. A number of other possible explanations for the difference between the schools could also be investigated including different levels of amphetamine use in the schools or catchment areas, perhaps leading to different levels of direct or vicarious experience of negative outcomes. In considering associations between interventions and differences in the utility of negative outcomes, it is worth noting that O' Connor and Saunders' (1992) cited a number of studies which found that changes in knowledge about negative effects of drug use do not necessarily lead to changes in behaviour.

While the combination of expectancy and value scores into utility data halves the total number of variables and allows more powerful statistical analyses than are possible using separate expectancies and values, it loses detail from the original data. For example, the loading of "being good at sports" on the Positives scale could reflect either that adolescents with overall positive expectations of amphetamine use also expect amphetamine to enhance sports performance or that they have neutral expectations of the effects of amphetamine on sports performance but that they highly value athletic ability. Further research, with larger samples, might clarify issues such as this.

Another limitation of the study is uncertainty about the reliability and stability of utilities and intentions over time. While the cross-sectional design allowed the comparison of simultaneous utilities and intentions, further research including test-retest components could provide more information about the stability of the scales and the stability of their relationship with each other.

Future research could also investigate the loss of participants through incompleteness and non-participation to establish whether there was sampling bias due to exclusion of subjects unwilling or unable to complete the questionnaire.

The significant loading in the subscales of items contributed by the youth groups and pilot test participants supports the process of consultation of adolescent drug users (youth groups) and non-drug users (via the pilot test). This process was employed to maximise the relevance of the items to the populations under investigation. In the light of O'Connor and Saunders' (1992) conclusion that the meaning of drug use varies over time and cultures, this process can be seen as a means of ensuring that changes in the meaning of amphetamine use to adolescents are included.

In summary, illicit amphetamine use is associated with high personal and social costs (Klee, 1992). However, so far little research has focused upon it and there is no consensus as to why the use of amphetamine has increased since the 1980s

(O'Donovan, 1992). The main conclusion that can be drawn from this study is that both positive and negative effects of amphetamine use need to be considered in interventions aimed at reducing the use of the drug since neither scale can address the whole variance in intention and changes in one do not affect the other. However, as O'Connor and Saunders (1992) noted, school-based drug education may lose some of its political charm once it is realised that it needs to include strategies other than generation of fear of negative consequences. In seeking to make school-based education more effective, research such as this also makes it a more challenging and socially complex enterprise.



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# AMPHETAMINE QUESTIONNAIRE

This questionnaire is confidential. Please **DO NOT** write your name on it.

1. How likely do you think it is that you will use Amphetamine in the future, if it is offered to you? (Please mark with a cross on the dotted line)

<I will never use                      I will certainly use>  
|-----|

2. How old are you? \_\_\_\_\_
3. What is your gender? ☐ Female ☐ Male
4. Were you born in Australia? ☐ Yes ☐ No

Please give honest answers to ALL the following questions by ticking the appropriate circle (eg: ☒ ☐ ☐ ☐ ☐)

How likely do you think it is that someone would experience the following things, because of the use of Amphetamine?

A = Very unlikely to happen,

B = Unlikely but could happen,

C = Unsure,

D = Quite likely to happen,

E = Almost certain to happen)

- |   | A                     | B                     | C                     | D                     | E                     |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 5. Having no money for other things                               | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 6. Being bored  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 7. Buzzing with energy  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 8. Having a sour taste in their mouth                             | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 9. Forgetting their problems                                      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 10. Seeing things in a different way                              | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 11. Feeling bliss or euphoria                                     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 12. Being able to study well                                      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 13. Being good at sports  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 14. Feeling down or depressed the next day                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 15. Getting caught by the police                                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 16. More confidence than usual                                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 17. More aggression than usual                                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 18. Being able to dance all night                                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 19. Feeling more attractive than usual                            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 20. Having an accident because the drug affected their judgement  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 21. Starting to use Amphetamine regularly                         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 22. Getting AIDS, Hepatitis C or blood poisoning                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 23. Having a mental breakdown (serious enough to be hospitalised) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

How much damage OR good do you think it would do to your lifestyle to experience these things?

(-2 = lots of damage

-1 = some damage, 0 = no effect, 1 = some good

2 = lots of good

- |   | -2                    | -1                    | 0                     | 1                     | 2                     |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 25. Having no money for other things                              | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 26. Being bored   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 27. Buzzing with energy   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 28. Having a sour taste in your mouth                             | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 29. Forgetting their problems                                     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 30. Seeing things in a different way                              | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 31. Feeling bliss or euphoria                                     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 32. Being able to study well                                      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 33. Being good at sports  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 34. Feeling down or depressed the next day                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 35. Getting caught by the police                                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 36. More confident than usual                                     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 37. More aggressive than usual                                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 38. Being able to dance all night                                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 39. Feeling more attractive                                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 40. Having an accident because the drug affected their judgement  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 41. Starting using Amphetamine more regularly                     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 42. Getting AIDS, Hepatitis C or blood poisoning                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 43. Having a mental breakdown (serious enough to be hospitalised) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 44. Other negative health effects                                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 45. What language(s) do you speak at home?                        |                       |                       |                       |                       |                       |

46. Are there any good or bad things about Amphetamine that are important to you that were not mentioned in this questionnaire? If so, what are they?
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

47. How honest have you been in filling out this questionnaire? (1=Completely honest, 4 = Not at all honest).      ☐1   ☐2   ☐3   ☐4

Thank you for taking part in this study.