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### **MATING EFFORT AS A PREDICTOR OF SMOKING IN A COLLEGE SAMPLE**

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#### **ABSTRACT**

*The present study examined how the amount of effort an individual puts into gaining and retaining access to sexual partners may impact smoking behavior. Using a college sample, results supported the prediction that individuals who are high in mating effort would be more likely to try cigarettes and smoke in social situations. Interpretations, implications, and directions for future research are discussed.*

## **INTRODUCTION**

The link between peer influence and smoking initiation is well established. For example individuals who are surrounded by friends, parents, or siblings who smoke are at an increased risk for trying smoking (Alexander, Allen, & Crawford, 1999; Aloise-Young, Graham, & Hansen, 1994, Friedman, Lichtenstein, & Biglan, 1985), becoming a smoker (Flay, Hu, & Richardson, 1998; Schofield, Pattison, Hill, & Borland, 2001; Urberg, 1992), and are less likely to want to quit (Ellikson, Tucker, & Klein, 2001; Falomir & Invernizzi, 1999; Jones, Schroeder, & Moolchan, 2004). However, one social factor which may have been overlooked in predicting smoking initiation is mating effort.

## **MATING EFFORT**

Mating effort is the effort put into finding, attracting, and guarding sexual partners (Boegart & Rushton, 1989; Charles & Egan, 2004, Rowe, Vazsonyi, & Figueredo, 1997). Since humans have limited resources (e.g., time, energy, money) mating effort comes at a cost to other areas where effort is needed such as somatic effort (e.g., learning, health) or parental effort (e.g., taking care of offspring; Boegart & Rushton, 1989; Bjorkland & Shackelford, 1999; Waynforth, 1999; Figueredo, Vasquez, et. al., 2005). Individuals vary tremendously in where they allocate their effort, leading to many different approaches towards reproductive life history strategies. These reproductive life history strategies range from those which require high amounts of mating effort to those which require very little. Individuals who tend to be higher in mating effort are much more oriented towards short term sexual relationships than those who have lower mating effort. Additionally, individuals are higher in mating effort are more competitive with respect to obtaining and retaining sexual access to partners. Thus, high mating effort individuals are more likely to be aggressive and take risks (e.g., fighting, experimenting with drugs) for short term gains such as obtaining a sexual encounter, even if such risks bare long term costs (e.g., criminal record, poor health).

## **SOCIAL INFLUENCE AND MATING EFFORT**

Peer influence and mating effort has been linked to socially important outcomes such as delinquency, drug use, criminality, and violence (Charles & Egan, 2004; Lalumiere & Quincy 1996; Maxwell, 2002). Individuals higher in mating effort individuals are also more likely to take risks to “show off” in order to get the attention of a prospective partner or friends. Individuals high in mating effort are also intrasexually competitive and seek out friends who share similar interests and levels of delinquency (Weiss, Egan & Figueredo, 2004; Egan, Figueredo, & Wolf, 2005). Likewise, mating effort has been shown to correlate with delinquency behaviors in at-risk populations of teens (Rowe, Vazsonyi, & Figueredo, 1997). Further, individuals seek out peers who are similar to themselves in domains such as smoking (Kobus, 2003), and high mating effort individuals are likely to share many of the delinquent behaviors with the peers they are trying to “show off” to.

In sum, the present study examines whether mating effort is a significant predictor of smoking in a sample of older teens and young adults (e.g., college students). While smoking is related to impulsivity and delinquency (e.g., Robins & Bryan, 2004), it is not known whether factors

correlated with impulsivity and delinquency (such as mating effort; Rowe et. al., 1997) correlate with cigarette smoking in a population of adolescents who are not “at-risk.” By “at-risk” we refer to adolescents who have not been adjudicated nor harbor delinquent tendencies. Thus, we used a college sample of convenience to determine if mating effort predicted cigarette smoking, and smoking in certain conditions.

In situations where smoking would help form an in-group connection (Kobus, 2003), individuals who are higher in mating effort are predicted to smoke. This is because such individuals think more in the short-term (e.g., forming a quick connection) rather than considering the long-term consequences of their actions. Individuals who are higher in mating effort are also predicted to be more likely to try cigarettes or initiate smoking than those who are lower in mating effort, because individuals higher in mating effort are more likely to take risks for short term gains, and be less likely to think about long term issues, such as health implications.

As a result, we predict that in situations where it would be socially beneficial to smoke (e.g., to connect with other smokers), individuals who are higher in mating effort will be more likely or willing to smoke, or try cigarettes. Thus, we hypothesize that mating effort will be positively associated with the initiation of smoking. Furthermore, we predict that smoking will be more likely to take place for high mating effort individuals in social situations. This is because smoking can serve as a means of mate displaying to others (Weiss, et al., 2004).

## **METHOD**

### **Research Participants and Procedure**

Students at the University of Arizona were given a smoking questionnaire during a large mass pre-testing session. Students were later invited to participate in a study on relationships and individual differences, and filled out a mating effort scale as part of a larger ongoing study. The data were then linked using identification numbers. A total of 129 Undergraduates (35% men, 63% women, 70% white (non-hispanic), mean age 18.8 years) at the University of Arizona were included in the study.

### **Measures**

#### ***Demographics and Mating Effort.***

The sex and age of the participant was obtained from a demographic questionnaire. Mating effort was assessed using the ten item Mating Effort Scale (Rowe, Vazsonyi, Figuerdo, 1997). This scale is designed to tap how much effort an individual allocates to obtaining and retaining sexual access to a partner or partners. This scale demonstrated good reliability ( $\alpha=.70$ ), and includes items such as, “would rather date several boys (girls) at once than just one boy (girl),” “I would get back at someone who looked at my boyfriend (girlfriend) in the wrong way.”

### ***Parental Smoking Status***

Parental smoking status was determined by asking participants whether their father, mother, both parents, or neither parents smoked (1=if any parent smokes, 0=if neither parent smokes).

### ***Restrictions in Smoking Environments***

Restrictions in smoking environments was determined asking participants which of the following best describes the rules about smoking where they live (0=smoking is not allowed anywhere, 1=smoking is allowed in some places or at some times, 2=smoking is allowed anywhere).

### ***Smoking Experience and Status.***

In order to assess whether or not participants ever tried smoking, participants were asked the question, "Have you ever tried cigarette smoking, even one or two puffs?" The participants were also asked when was the first time they tried a whole cigarette (if they have ever smoked a whole cigarette), if participants answered with any age they were given a score of "1," however if participants indicated that they never smoked a whole cigarette, they were given a score of "0." We determined whether or not the individual ever smoked consistently by asking participants to indicate either yes or no to the question, "Have you ever smoked cigarettes daily, that is, at least one cigarette every day for 30 days?" For each item above, participants were given a score of "1" if they indicated yes, and "0" if they indicated no.

### ***Smoking in Social Situations.***

In order to determine how likely an individual is to smoke in social situations, participants were asked the question; "Do you smoke cigarettes when you are" (check all that apply): At home, at parties, with friends who smoke, with friends who don't smoke, at work, drinking alcohol, in public, driving, & waiting at the bus stop (yes=1, no=0). The yes or no responses were then averaged such that a higher score indicated more social situations the individual reported smoking in. This scale demonstrated excellent reliability ( $\alpha=.93$ ).

### **Statistical Analysis**

We used Sequential Canonical Analysis (Davis, Guggenheim, & Figueredo, 2007; Gorsuch, 1991; Gorsuch & Figueredo, 1991; Guggenheim, Davis, & Figueredo, 2007; Figueredo & Gorsuch, 2007; Figueredo & Sage, 2007) in order to analyze the effect of Sex, Age, Mating Effort, Parental Smoking Status, and Restrictions in Smoking Environment on Having Tried Smoking, Smoking a Whole Cigarette, and Smoking Consistency. The reason for this was that the criterion variables were correlated with one another, as were the predictor variables. Thus, traditional Chi-squared tests for significance would be biased due to shared variance between the multiple criterion variables. This procedure allows an individual to partial out the effects of one criterion variable from the next in a theoretically-specified sequence, as hierarchical General Linear Model (GLM) does for the predictor variables. Thus, the criterion variables which occur earlier are given causal priority; those criterion variables which occur later in the sequence are controlled for any indirect effects through prior criterion variables. We therefore entered the

predictor variables according to developmental significance: sex, age, mating effort, parental smoking status, restrictions in smoking environment, since the variables are likely to impact an individual’s development and smoking trajectory in this order<sup>1</sup>. Likewise, the three categorical criterion variables were entered according to the order of which they would occur for an individual (e.g., one must “try” a cigarette before they could smoke a whole cigarette, and one is most likely to have smoked a whole cigarette before being a regular smoker). We then conducted a hierarchical General Linear Model (GLM) to determine how Sex, Age, Mating Effort, Parental Smoking Status, and Restrictions in Smoking Environment would impact Smoking in Social Situations. Again, this is because of the co-linearity between many of the predictor variables.

**RESULTS**

We first examined the impact of Mating Effort, Parental Smoking Status, Sex, and Restrictions in Smoking Environments on whether the participant had tried cigarettes, smoked a whole cigarette, and reported ever being a regular smoker. Results indicated that the model predicting having tried smoking was significant (*Chi-squared*=12.05, *p*=.03, *Eta-squared*=.32). Results further indicated that only mating effort significantly predicted whether or not a participant had tried smoking (*Chi-squared*=5.40, *p*=.02; see table 1 for all *Chi-squared*, *Eta-squared*, and *p* values). Thus, individuals who are higher in mating effort are more likely to have tried a cigarette compared to those who are lower in mating effort. Results indicate that there was no significant effect of any of the variables on having tried a whole cigarette (*Chi-squared*=3.09, *p*=.30, *Eta-squared*=.16). Lastly, the model predicting consistency in smoking was significant (*Chi-squared*=12.61, *p*=.03, *Eta-squared*=.32), however, only age predicted whether or not the individual reported having been a consistent smoker. Indicating older individuals reported more consistency in smoking.

**Table 1. Individual Predictors of Trying Smoking, Smoking a Whole Cigarette, and Daily Smoking**

Predictor	Tried Cigarettes	Smoked a Whole Cigarette	Daily Smoker
Sex	Eta-squared=.01 Chi-squared=.01 <i>p</i> >.10	Eta-squared=.03 Chi-squared=.11 <i>p</i> >.10	Eta-squared=.03 Chi-squared=.09 <i>p</i> >.10
Age	Eta-squared=.17 Chi-squared=3.39 <i>p</i> =.06	Eta-squared=.07 Chi-squared=.61 <i>p</i> >.10	Eta-squared=.29 Chi-squared=9.86 <i>p</i> >.05
Mating Effort	Eta-squared=.21 Chi-squared=5.40 <i>p</i> =.02	Eta-squared=.08 Chi-squared=.82 <i>p</i> >.10	Eta-squared=.00 Chi-squared=.00 <i>p</i> >.05
Parental Smoking Status	Eta-squared=.16 Chi-squared=2.96 <i>p</i> =.08	Eta-squared=.11 Chi-squared=1.48 <i>p</i> >.10	Eta-squared=.15 Chi-squared=2.66 <i>p</i> =.10
Restrictions in Smoking Environment	Eta-squared=.01 Chi-squared=.01 <i>p</i> >.10	Eta-squared=.02 Chi-squared=.01 <i>p</i> >.10	Eta-squared=.00 Chi-squared=.00 <i>p</i> >.10

We then examined how Sex, Age, Mating Effort, Parental Smoking Status, and Restrictions in Smoking Environments would impact Smoking in Social Situations. In order to test this we entered each variable in a General Linear Model (GLM) due to the mix of categorical and continuous predictor variables (see methods section for dummy coding). Results indicated that the model as a whole was marginally significant ( $F=2.15, p=.06, R^2=.09$ ). However, Mating Effort was the only variable significantly associated with Smoking in Social Situations, ( $F(5, 120)=6.30, p=.01$ ). (See table 2 for *Beta* weights, *F* values, and *p* values). Thus, individuals who are higher in Mating Effort are also more likely to smoke when they are in a social situation.

**Table 2. Predictors of Smoking in Social Situations**

Predictor	<i>Beta</i> Weight	<i>F</i> Value	<i>p</i> Value
Sex	-.04	1.14	>.10
Age	.11	1.72	>.10
Mating Effort	.23	6.30	=.01
Parental Smoking Status	.01	0.12	>.10
Restrictions in Smoking Environment	.11	1.47	>.10

## DISCUSSION

The present study gives support to the hypothesis that mating effort is likely to lead individuals to try smoking and smoke when they are in a social situation. The reason we believe this occurs is due to the short term strategic thinking of high mating effort individuals. Individuals who are high in mating effort often think in the short term and do not examine the more long term consequences of their actions. Moreover, smoking has been shown to be a social lubricant and an in-group identifier (Falomir & Invernizzi, 1999). Thus in a social situation where others are smoking in front of individuals who are higher in mating effort, or a situation where a smoker is asking an individual who is higher in mating effort if they'd like to "give it a try," it is likely that the individuals who are higher in mating effort will give it a try and/or smoke since it is likely to grease the wheels for social interactions which might lead to mating opportunities, friendship coalitions, and reputation benefits among certain cohorts. Therefore, mating effort is predicted to lead to smoking behavior in such situations, taken the short term thinking and opportunistic behavior of higher mating effort individuals.

An interesting finding is that smoking in front of friends who don't smoke was highly correlated with all of the other items in the smoking in social situations scale and with mating effort. Thus, it does not seem that only smoking in front of smokers is a behavior correlated with higher mating effort. A possible reason for this would be that individuals higher in mating effort may also be pushing for reputation as well as immediate social benefits. Further, individuals higher in mating effort may on average spend more time with individuals who share many behaviors and beliefs (e.g., drug use, delinquency), so while an individual higher in mating effort may not be with smokers per se, smoking when in a social setting may reinforce some images of reputation the individual higher in mating effort wishes to convey.

It is important to note that we tested different orders of the predictor variables. The significance findings did not differ according to order of predictors. Furthermore, the model is significant if “sex” is removed. We retained sex as a predictor because of its high correlation with Mating Effort ( $r=.36$   $p<.01$ ). As before, the predictor variables were placed in order of causal priority based on theory, we tested alternate orders and they did not significantly change the result associated with each predictor.

Mating effort did not correlate with smoking a whole cigarette, nor did it predict becoming a regular smoker. This is not surprising since neither of these outcomes is inherently tied to any benefits of the opportunistic propensities described above. It isn't likely that individuals who are higher in mating effort will have additional social benefits from smoking regularly, on their own, or finishing cigarettes they try. Therefore, it makes sense that age was the only predictor of being a regular smoker. This is because for those who do try smoking regularly, the cumulative effect of trying multiple times is likely to ultimately lead to an addiction. Furthermore, while parental smoking wasn't significantly related to becoming a regular smoker, it is likely that this is a major contributor. Also, when analyses were done not controlling for having tried smoking, or smoking a whole cigarette, parental smoking status did significantly predict being a regular smoker ( $Chi-squared=6.02$ ,  $p=.01$ ,  $Eta-squared=.22$ ). There is also evidence that a genetic link exists for factors affecting reproductive strategies like mating effort (Figuerdo, Vasquez, Brumbach, & Schneider, 2005). Thus, it may be the case that parental smoking status is actually having an effect on some of the dependent measures in the present study possibly through the inheritance of mating effort or reproductive strategy.

It may also be that the mating effort or reproductive strategy of parents, in addition to being inherited by offspring, may be impacting the environment of offspring (Ellis, 2004), which would lead to changes in their reproductive strategy or mating effort, which in turn may lead to smoking behavior. Likewise, the reproductive strategy of the parents may alter the environment leading to other outcomes (e.g., delinquency, stress) which may mediate the link to smoking behavior in offspring. Thus, there may be a larger correlation of mating effort to several other critical variables (e.g., delinquency, drug use, criminality, parental neglect), or indirect effects of parental smoking or mating effort, which are ultimately the causes of smoking behavior, and mediate the process of mating effort to smoking predictions.

The present study demonstrated that individuals who are higher in mating effort are at an increased risk for trying smoking and smoking in social situations. Further research needs to be conducted to understand the precise nature of this relationship, and how several other variables such as parental mating effort, delinquency, criminality, drug use, and parental care and attitudes may mediate or moderate the process.

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**APPENDIX A. CORRELATIONS, MEANS, STANDARD DEVIATIONS**

	Sex	Age	Mating Effort	Parental Smoking status	Restrictions in smoking environment
Sex	...				
Age	r= .33 n= 121	Mean= 18.80 Standard Deviation= 1.53			
Mating effort	r= .25 n= 121	r= .19 n= 121	Mean= -.48 Standard Deviation= .55		
Parental smoking status	r= -.07 n= 121	r= .12 n= 121	r= .00 n= 121	...	
Restrictions In smoking environment	r= .11 n= 121	r= .04 n= 121	r= .10 n= 121	r= .10 n= 121	...