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**Attitudes and Behavior**

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# Why Don't We Say What We Mean and Me and What We Say? Exploring Differences Between Implicit and Explicit Attitudes and Behavior

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**ABSTRACT**—*In the area of Social Psychology, there seems to be a reemerging interest in the relationship between attitude and overt behavior. Since as early as the 1930's, studies have shown diverse results, from weak correlations between attitude and behavior to compelling evidence that suggests that behavior can be predicted by one's predisposing attitude toward a given issue. In our society, such information is vital as politics and marketing strategies are based on how well what people say predicts what they will do. Perhaps the possible relationship between attitude and behavior is best observed, however, on a smaller scale through interpersonal behavior. This focused review explores definitions of attitude, differentiates between implicit and explicit components, and identifies other influences on behavior. We also discuss some possibilities for future research in comparing attitude and behavior with regards to gender as a status characteristic.*

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In the area of Social Psychology, there seems to be a reemerging interest in the relationship between attitude and overt behavior. In our society, such information is vital because government politics and even marketing strategies are based on how well what people say predicts what they will do. The interest in this relationship was met with mixed and even conflicting information from early sociological studies that found little or no relationship between attitude and subsequent behavior. While behavior is easy enough to observe, test measures for attitudes were limited to traditional surveys, interviews, and questionnaires, which offered a narrow scope for attitudinal analysis. The uses of these measures prove problematic if the participants fail to report honestly or if the questions lack objectivity. A focused review of attitudinal research, possible mediating factors, underlying components, and the ongoing search for its relationship to behavior begins with some reflection of ancillary work and an evaluation of early methods of testing.

Throughout the past several decades, social-psychological research has heavily explored the ongoing

proposition that a relationship exists between attitude and behavior. Specifically, it is assumed that attitudes should predict behaviors, since attitudes have been defined as predispositions to behavior (LaPiere, 1934; Wicker, 1969; Weinstein, 1972; Ajzen & Fishbein, 1973; 1977; Hill, 1981). Since as early as the 1930's, there have been comparisons between attitude and overt behavior, and the pioneering work of LaPiere (1934) explored this area of study. He found no relationship between a written expression of attitude and subsequent behavior. His travels with a Chinese couple and the warm reception they received from hotel managers showed no reflection of the negative written replies LaPiere received when inquiring about accommodations for them (LaPiere, 1934, 1938). Evaluation of LaPiere's work ranged from attacking the integrity of his methodology to upholding the findings as a major turning point in social psychology research. This was among the first of many studies that fueled debates about how well attitude predicts behavior, the underlying elements of the two variables, and possible relationship that may exist between them.

## CORRELATIONS IN ATTITUDE AND BEHAVIOR

In the late 1960's, Wicker reported a collective study of more than thirty publications on the comparison of attitudes and behavior. He found that:

Taken as a whole, these studies suggest that it is considerably more likely that attitudes will be unrelated or only slightly related to overt behaviors than that attitudes will be closely related to actions. Product-moment correlation coefficients relating the two kinds of responses are rarely above .30 and often are near zero. Only rarely can as much as ten percent of the variance in overt behavioral measures be accounted for by attitudinal data (Wicker, 1969, p. 65).

Benninghaus expanded Wicker's work and found that although there were slightly higher correlations, distribution

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**Table 1. Measures of Association between Attitudes and Behavior\***

Association	Wicker's Original Sample		Benninghaus's Original Studies		Total	
	N	%	N	%	N	%
Inverse	3	7	4	7	7	7
No Relationship	17	38	10	18	27	26
Weak Positive Relationship	11	24	23	40	34	33
Modest Positive Relationship (Association between .31 and .50)	9	20	12	21	21	21
Strong Positive Relationship (Association above .50)	5	11	8	14	13	13
Total	45	100	57	100	102	100

\*Adapted from Benninghaus (1976) Tables 4.53 and 4.54, pp. 263-64 (Hill, 1981, eds., Rosenberg & Turner, 1992, p. 351).

of relationships supported Wicker's previous findings (see Table 1.)

### DEFINING ATTITUDE AND UNDERLYING COMPONENTS AS POSSIBLE PREDICTORS OF BEHAVIOR

While there are consistencies in the Wicker (1969) and Benninghaus (1976) findings indicating generally weak relationships between attitudes and behavior, one possible issue is that the definitions used for the attitudinal concept have often presented a problem with testing accuracy. The operational definitions vary dramatically across studies, and there has never existed a general consensus in the social science community for defining attitude (Ajzen, 1971; Ajzen & Fishbein, 1973; Schuman, 1972; Weinstein, 1972). This raises questions not only about the reliability of past experimental procedures for attitude, but also the validity in cross-comparing those studies that may not share similar definitions.

Measurement procedures for attitude have included surveys and questionnaires or verbal responses, with attitude sometimes measured broadly, and sometimes quite narrowly (Ajzen, 1971; Ajzen & Fishbein, 1973; Schuman, 1972; Weinstein, 1972). Additionally, some models describe attitude as multidimensional, including affective, cognitive, and conative components, thus making simple measures of attitudes potentially less than adequate predictors of behavior (Ajzen & Fishbein, 1974). It has been found that the three dimensions are intercorrelated, so this distinction

is not likely to predict behavior any more efficiently. Fishbein and Ajzen (1974) proposed a distinction that explores attitudes toward objects or behaviors more narrowly whereby behavior is not predictable from a global attitude toward an object stimulus but rather is related to a more specific attitude toward a behavior of interest.

The Fishbein-Ajzen model describes attitude as an independent variable, but it is conceivable that an expression of attitude can be tempered by both one's belief and intention. So it is important to reference this model and further clarify the distinction between belief, attitude, and intention. A belief is considered to be based upon a "probability judgment that links some object or concept to some attribute" (Ajzen, 1978, p.378), and the strength of the belief is understood to be the subjective probability that a relationship, or link, exists between the two.

Attitude, on the other hand, is described as a "bipolar evaluative judgment of the object" (Ajzen, 1978, p.378). A person may have a subjective judgment as to liking or disliking a particular object, event, or behavior while linking it to an associated attribute. One's intention seems to be more closely associated to the definitive features of a belief rather than an existing attitude. The Fishbein-Ajzen model illustrates that a belief has a direct link to a behavior outcome through one's intention. The intention seems to be determined by the individual's "belief about his or her own performance of a given behavior" (Fishbein, 1978, p. 378) and whether it will lead to an evaluative positive outcome, as opposed to whether he or she possesses a positive or negative attitude about an object or concept. It certainly seems plausible that our beliefs are causal factors for our behaviors, and more

recent studies have examined the degree to which belief determines intention.

Ajzen (2000) has expanded the initial model proposed to improve consistency between attitude measures and behavior. Also, it has been found that behavior can be influenced by what is expected in a situation and is not always guided by one's perceived control of situational outcomes. Measuring for consistency between attitudes and behaviors should account for three types of beliefs: behavioral, normative, and control. Where behavioral beliefs deal more with attitudinal consideration, how positively or negatively the outcome associated with a behavior is perceived. The normative beliefs will guide behavior by what is socially expected. In other words, what does the person believe will be the reactions of others to the performance of the behavior? Control beliefs play a role in behavioral outcome by the perceived level of difficulty of a given task or situation (Ajzen, 2002). One's behavioral intention is expected to be a culmination of the three belief types and the behavior will more likely be carried out when positive outcomes, approved by others, can easily be achieved.

The issue of specificity when measuring attitude-behavior concepts might also include determining factors such as individual differences or dispositional variables that affect attitude-behavior consistency. For example, individual differences in self-reporting could produce inconsistency when subjects lack the ability or inclination to process and self-report attitudes or beliefs with accuracy. At which point, methodology becomes the most important issue in testing, as it would be difficult to assess which variable is actually being measured (belief or attitude) if the variables are not clearly defined and testing does not offer precise measure. Additionally, it would be necessary to take a closer look at possible motivating factors in accounting for individual differences in self-reporting, such as personality or social perceptions.

### **SELF-MONITORING, A MEDIATING FACTOR**

Snyder's findings in the 1970's identified two types of people, high self-monitors and low self-monitors. High self-monitors are those individuals who rely heavily on external and situational cues to determine their behavior to the extent that they are somewhat "chameleon-like" in social situations (Snyder, 1974, p.527) and possibly more sensitive to stereotyping (Snyder, Tank, & Berscheid, 1977). Whereas, low self-monitors are more inclined to allow internal cues and attitudes to guide them in social situations. It seems logical, therefore, that high self-monitors would show a lower level of consistency between attitude and behavior, as behavior is dependent primarily upon environmental cues. They also may be more responsive to social norms in a situation.

A recent look at high self-monitoring behavior has been linked to prestige and perceived status in consumerism. In a North American sample, groups of individuals who were

identified as high self-monitors showed a stronger preference for "status-oriented product claims" while the low self-monitors seemed to be more concerned with quality and functionality of a product (Czellar, 2003). This is an interesting finding that offers an informed direction for the advertising industry, but even more interesting are the implications for linking high self monitoring to other social status characteristics. It is plausible that high self monitors also have a higher sensitivity to social status characteristics such as age, race, and gender, as well as socioeconomic or educational levels in social situations. This sensitivity could affect their behavior as much as their attitudes do.

### **STATUS THEORY AND INFLUENCES ON TASK BEHAVIOR**

The strength of situational differences and the types of situations that do predict a level of consistency between belief and behavior are sometimes guided by status orientation and second order expectations. That is, one's behavior is mediated by another's level of expectation (Berger, Cohen, & Zelditch, 1966; Berger & Conner, 1969), and in certain situations, it is the performance expectation or one's personal belief in task competence that is found to moderate behavior (Berger et al, 1966; Berger & Conner, 1969). In the status theory work of Joseph Berger (1966; 1969), which describes the expectation states formed by small leaderless groups, observing interactions and measuring the frequency of defined behaviors for individuals reveals a pattern of differentiation in behavior. As interaction time increases, status roles for individuals emerge. Berger labels the phenomenon power and prestige structure, which may explain the level influence one person, may have over the beliefs and performance of another (Berger et al, 1966; Berger & Conner, 1969). Inequality has been measured by level of active participation (Bales, 1953), individual ranking as to who contributes most to problem-solving, and the observed amount of influence within the group (Bales & Slater, 1955). Since expectations and actions are usually measured by the extent to which external and internal cues determine behavior, expansion of Berger's theory controlled for three additional variables. Controlling for the first requires that participants enter the study with no preconceived notion of problem-solving ability. For example, if an individual were part of a task group and entered into the task with high or low expectations of how well he or she will perform at the given task, it would be difficult to discern whether the performance outcome was influenced by status orientation within the group or by a preconceived notion of ability. The second addresses the motivational factor. Each participant is expected to be task oriented. If the task group were set up as a team working toward solving a problem, the participant should recognize the importance of the task and work diligently toward a solution. Controlling for the third variable ensures that individuals enter the task collectively focused.

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If one is “person oriented” or generally prefers to work and solve problems alone, it is not likely that status orientation within the group will influence his or her decision-making process (Webster, Jr., 1969; Fiske & Ofshe, 1970).

In these studies, it has been found that “problem-solving interaction leads to formation of more or less enduring ability conceptions, called *expectation states*, for the actors involved” (Webster & Entwisle, 1976, p. 493). One’s expectations cannot be observed, so it is necessary to consider the consistency of status within the task group with behavioral outcomes, as well as individual and situational differences (Webster & Driskell, 1978). Many times, social status characteristics of individuals that are *evident* upon interaction, *predict* the interaction. It has been found that “much status information gets conveyed without deliberate effort by an individual...(and) individuals have little control over whether such information becomes salient” (Webster, Jr., Whitmeyer, & Rashotte, 2003). Such structural status characteristics can include race, age, gender, etc., and operate under five assumptions.

The first assumption essentially says that in a two-person group, both partners notice a social status difference between them. For example, if one partner defines himself as male while the other partner defines herself as female, and the two agree on the status difference, gender becomes salient upon interaction.

The second assumption states that both partners must also associate the two different statuses to differing performance expectation levels. Those expectations should be evident during the group task, even if the task is gender neutral. For example, if both male and female hold males, in general, at a higher performance expectation on most tasks, evidence of this will emerge during their interaction on a task that is unrelated to gender.

The third assumption says that even if other group members are introduced to the group, the operating status structure will remain in tact. For example, additional males or females to the task group will not affect the levels of performance expectation with regard to gender as a status.

The fourth assumption addresses the aggregation of status information for any one individual within the group. It assumes that the effect of one positive status characteristic possessed by an individual has a stronger influence on group interaction if that same individual possesses multiple negative status characteristics. For example, assuming that gender operates as a diffuse status (holding males at a higher performance expectation) in a task group, the positive status of being male has a greater effect on the task group if he also possesses an inconsistency in other status characteristics, such as less education or a poor socioeconomic background.

The fifth assumption says that behavior results from the aggregation of status information for each actor and is a direct function of the diffuse status characteristics that was initially established within the task group (Webster et al., 2003).

Albeit only salient in particular situations, several studies have indicated gender as a diffuse status

characteristic within small groups (Pugh & Wahrman, 1983; Snodgrass, 1985; Ridgeway, Johnson, & Diekema, 1994; 1995; Wagner & Berger, 1997). Surprisingly, there seems to be some evidence that performance expectation and task competence have a greater impact on the actual performance and behavior of women when placed in a task-oriented setting:

Females appear to be somewhat more strongly affected by status expectation differences than men. Status theory does not account for this effect...there are other kinds of gender differences that remain unexplained. It is reasonable to presume, for example, that there are differences in expressive behaviors that are associated with gender... Women and other traditionally low status actors who attain task leadership positions often have difficulty wielding directive power over others in the groups they lead, despite the high rank they have achieved (Wagner & Berger, 1997, pp. 22-23).

Pugh and Wahrman (1983) had previously tested this phenomenon in a baseline study where males were placed with female counterparts to complete a novel, yet gender-neutral, task. The only knowledge given the participants was that their partner was of the opposite sex. Including same-sex control groups, it was found that “women deferred to men more often than men deferred to women” (Pugh & Wahrman, 1983, p. 755). Other findings in this same study reveal women reporting the feeling of having contributed less to the task than they of male counterparts. A subsequent study observed the subordinate status of women as a contributing factor to interpersonal sensitivity. In mixed-sex dyads, the sex of the opposing partners influenced a greater sensitivity effect in women (Snodgrass, 1985) than did the same-sex dyads. It was found that the proposed social status of women was not perceived as salient in women only groups.

Contrary to the current findings of Foschi and LaPointe, who assert that there was no significant evidence that supports gender as a diffuse status characteristic (2002), another study explains that the trouble women experience “wielding directive power” may have less to do with self-confidence or task ability and more with status legitimacy (Ridgeway et al., 1995). If high-ranking individuals with status disadvantages behave assertively in their leadership positions, it is found that they are perceived less favorably. It is believed that “resistance to the directive use of power from high-ranking women is due to violations of gender norms” (Ridgeway et al., 1994, p. 1052). Moreover, it is suggested that if steps are not taken to legitimate the woman in her leadership capacity, the female’s socially perceived status disadvantage will be imported into the task and her leadership efforts will be resisted by the group. However, in same-sex studies, legitimacy for female leadership roles was more profound in groups of women, in comparison to those with men (Ridgeway et al., 1995). It appeared that the assumed

leadership roles of women were more strongly supported among the groups who were all women.

In mixed-sex groups, if females have reported feelings of contributing less and have difficulty in directive positions, and yet experience strong feelings of legitimacy among women only groups, it is possible that perhaps the female's status disadvantage within a group is a self-imposed status disadvantage. If females perceive males to have a status advantage in society, or accept the notion that males are generally better at most tasks, it is logical that the female will orient her status within the group subordinate to that of the male, deferring to him more often throughout a given task.

At the University of North Carolina at Charlotte, participants in a recent study were asked to complete a confidential response survey that addressed such contemporary beliefs about gender abilities. This was a vignette study called *The Survey of Judgments of Various Abilities* (Rashotte & Webster, Jr., 2002) and consisted of male and female photographs, all portrayed as college students from various universities. The pictures were downloaded from the Internet, and neither names nor college identities were valid. However, this presentation was necessary so that the participants in this sample perceived the photographs to be those of a peer group (of same age and education level). Gender was not revealed as the variable being tested, and there was no prior discussion of gender being pertinent to the written responses. Based strictly on perceptions of a photograph that depicted each individual as either a noticeable average-looking male or female, participants were asked to rate him or her on some specific and general abilities. It was found that both men and women reported higher expectations on specific and general abilities for men (Rashotte & Webster, Jr., 2002), confirming that, on some level, gender must still operate as a diffuse status characteristic.

In American society where women are serving as CEOs of major corporations, holding political offices, and serving on the Supreme Court, it is surprising to find that females have trouble "wielding directive power" in small task groups and still perceive the male gender as a preferred status, holding males at a higher performance expectation. More than ever, females are attending colleges and universities and expanding their horizons with the conscious understanding that the female gender is no longer a subordinate characteristic. Perhaps it is not explicit attitudes that limit female capacity in assertive tasks, but their implicit attitudes about gender as a status.

The implicit attitude that *male* is associated with a higher status and is, therefore, held to a higher performance expectation could very well manifest in female behavior and affect her task performance in socially diverse settings. Perhaps the previously discussed vignette study on gender ability (Rashotte & Webster, Jr., 2002) successfully identified some implicit associations for male gender as a preferred social status. However, until recently, the inability to apply precise measure to implicit attitudes has limited our

understanding of and access to these possible unconscious associations. Yet, it is possible that the implicit element has a direct influence on or, at least, a close correlation to behavior.

### COEXISTENCE OF IMPLICIT AND EXPLICIT ATTITUDES AND MEASURES

A recent study explored the duality and interplay of implicit and explicit attitudes. Dual attitudes exist when there are differing or opposing attitudes toward the same object or stimulus. The automatic, or implicit, attitude is a deeply ingrained thought process or association and, much like a habit, is difficult to alter. The explicit attitude is more socially conscious and is much easier to change based upon circumstance. Whether or not the explicit attitude is expressed depends upon whether the individual has the "cognitive capacity to retrieve the explicit attitude and whether this overrides the implicit attitude" that coexists about the object stimulus (Wilson, Lindsey, & Schooler, 2001, p.101).

In general, attitude can be defined as an internal evaluative judgment or a ready response to a given situation or object stimulus (Ajzen & Fishbein, 1973; 1977; Fishbein & Ajzen, 1974; 1978), but implicit attitudes are further described as *unconscious* associations with regard to a particular topic (Greenwald & Banaji, 1995; Greenwald, McGee, & Schwartz, 1998; Greenwald, Nosek, & Banaji, 2003). The usage of the word *implicit* was chosen because of its definitive use in memory cognition research (Wilson et al., 2001; Greenwald et al., 2003). Recent reports critique the usage of *implicit* in this context and the assumption that subjects must be unaware of their existing attitudes (Fazio & Olsen, 2003). However, it could be argued that even if one is made aware of his or her associative preferences, the person may not know the reason or motivation behind it (Greenwald & Banaji, 1995; Greenwald et al, 2003).

Introduced primarily in the work of Anthony Greenwald and his colleagues (1995; 1998; 2003), implicit attitude testing involves timing one's automatic associative responses when presented with computer test trials that are grouped into test blocks for a word or topic stimulus. For example, if *gender* was chosen as the topic and *male* and *female* were the target words, stimulus words would be those words characteristically associated as being male or female (i.e., *him, her*) and grouped accordingly. The response times for categorizing the stimulus words would be recorded as a latency score. A test condition would pair each target word with an attribution word and present stimulus words that are characteristically associated with those attributions. A response time for paired categorization would also be recorded as a latency score.

The *Implicit Attitude Test* (IAT) (Greenwald et al, 1998) has become prevalent in research literature, and the additional benefit of a timed response limits the subject's opportunity for beliefs, rationale, or explicit awareness of the concept being measured to affect responses. Explicit measures, however, encourage a conscious evaluation of a

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topic matter through the use of surveys, questionnaires, or personal interviews. Therefore, most of the data collected on past research of attitudes would be considered explicit measures. Where a survey or questionnaire may reflect socially conscious attitudes and provide opportunity for deliberation, the IAT controls for these concerns. The IAT provides a restriction on response times that deflects the tendency for political correctness or self-presentation and allows underlying biases to emerge. Strengthening the internal consistency of this test, a new and improved scoring for this same computer-generated test also “divides the difference between test block means by the standard deviation of all latencies” (Greenwald et al., 2003, p.201) to account for the overall response time of a participant. The ultimate assessment of implicit attitudes is *D* score, which quantifies the degree of bias in the underlying attitude.

## CONCLUSION

The work on implicit cognition is in its infancy and is still in the process of building a clear theoretical construct. The burden of proof must exist in the implicit attitudes’ predictability of behavior. Much research has focused on the comparison of implicit and explicit attitudes, but we were unable to locate any recent work comparing the two with overt behavioral measures. It is possible that both implicit and explicit attitudes play integral parts in behavior, but it is also likely that one has a stronger correlation with behavior in some situations. Some researchers believe it would be informative to administer the IAT prior to behavioral testing to avoid the likelihood of behavior influencing attitude (Fazio & Olsen, 2003). Likewise, it appears necessary to allow for a lapse of time between attitude and behavioral testing to prevent the reversal of this same effect.

In comparing implicit and explicit attitudes, it is still likely that some predictable elements will emerge, particularly if a subsequent task behavior explores the same targets and attributions as those used in IAT testing. Moreover, combining what we know of Snyder’s (1974; 1977) studies and the possibility that self monitoring could be a contributing factor to the inconsistency between attitude and behavior, it is plausible that high self-monitoring may actually be indicative of an underlying conflict between implicit and explicit attitudes. For example, in women, if there is inconsistency between implicit and explicit attitudes toward gender-attributive characteristics, then it is likely that the social awareness level of high self monitoring will invite conformity and higher acceptance of influence from a male counterpart, particularly if she possesses an *implicit* association for the male gender as a higher status characteristic.

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# The Relation Between Parental Alcohol Use and Adolescent Alcohol Use

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**ABSTRACT**—*Parents serve as a role model for their children. Parents are responsible for teaching their children how to behave and how not to behave. If this is the case, then when a parent does something in front of his or her child, the child begins to think that is the right way to behave. This study looks at parent's level of alcohol consumption and compares it to their adult children's level of alcohol consumption. I hypothesized that a parent's level of alcohol consumption will be strongly correlated with their adult children's level of alcohol consumption. In order to test this hypothesis, I developed an Alcohol Use Survey. The survey was then completed by twenty-seven participants from the campus of the University of North Carolina at Charlotte. I found that there is a strong correlation between a parent's level of alcohol consumption and their adult children's level of alcohol consumption. The reasons that the adult children of parents who consume alcohol tend to themselves consume alcohol is discussed.*

Today there are many adolescents with alcohol abuse problems. It is common to hear people blame the parents of these adolescents. Many studies have found that there is a strong relation between a parent's alcohol consumption and the alcohol consumption of their adolescent children (Chaoyang Li & Chou, 2002; Cleveland & Wiebe, 2003; Hussong & Chassin, 1997; McMorris, Tyler, Whitbeck, & Hoyt, 2002; Zhang, Welte, & Wiczorek, 1999). Though the exact relation is constantly debated, it is generally agreed that parental alcohol consumption can be both directly (Chaoyang Li & Chou, 2002; Zhang et al., 1999) and indirectly (Cleveland & Wiebe, 2003; McMorris et al., 2002) related to an adolescent's consumption of alcohol.

According to the Social Learning Theory by Albert Bandura (Rutledge, 2000), we learn by observing the behaviors of others as well as by the outcome of those behaviors. Another name for this type of learning by observing is called modeling. Some people say that when parents consume alcohol in front of their children they are acting as a role model. This role modeling has a direct effect on the adolescent. If the parent gives a favorable impression of alcohol consumption, then the adolescent is more likely to consume alcohol. However, if the parent gives a non-favorable impression of alcohol consumption, then the adolescent is less likely to consume alcohol. This relation is stronger when the parents and adolescents are of the same sex (Chaoyang Li & Chou, 2002; Zhang et al., 1999).

Another way in which we see a direct effect is in the finding that adolescents from homes in which at least one parent uses alcohol come to expect more "positive outcomes" in their own use of alcohol (Cleveland & Wiebe, 2003). One of the most common "positive outcomes" that the adolescent comes to associate with alcohol consumption is acceptance. The adolescent comes to believe that if he or she consumes alcohol then he or she will be accepted and liked more by his or her peers. Because the adolescent expects these "positive outcomes" from alcohol consumption, he or she is more likely to consume alcohol (Cleveland & Wiebe, 2003).

There are many ways that parental alcohol consumption can indirectly affect adolescent alcohol consumption. The main indirect affect of parental alcohol consumption is that the parent who is consuming alcohol exhibits poor parenting skills (Hussong & Chassin, 1997). Usually, when a parent is consuming alcohol the adolescent is not being properly supervised. When the adolescent is not being

properly supervised, he or she has more opportunities to engage in risky behaviors, which include the consumption of alcohol. Also, when the adolescent is not being properly supervised, he or she may have more opportunities to interact with peers who are consuming alcohol. These peers who are consuming alcohol offer the adolescent acceptance and understanding, because most of them come from a home in which one or more parent consumes alcohol (Cleveland & Wiebe, 2003).

Another fairly common thing to occur when a parent is consuming alcohol is that the parent becomes abusive (Cleveland & Wiebe, 2003; McMorris et al., 2002). This abuse can take the form of physical, sexual, and/or verbal abuse of the adolescent (Cleveland & Wiebe, 2003; McMorris et al., 2002). Many people who consume alcohol demonstrate different behaviors than when sober. For example, a parent who is generally loving and caring can consume alcohol and turn into an aggressive person who likes to hit their adolescent child.

The abuse that the adolescent suffers is linked to another effect of parental alcohol consumption, most commonly known as coping. Many adolescents who live with parents who consume alcohol as a coping strategy may themselves turn to alcohol as a coping strategy. There is a lot of stress associated with growing up around a parent who regularly consumes alcohol. An adolescent with a parent who regularly consumes alcohol may come to feel as if he or she has to take care of his or her parent. This can cause the adolescent to feel isolated from others. One way that the adolescent learns to cope with his feelings of stress and isolation is to consume alcohol (Hussong & Chassin, 1997; McMorris et al., 2002). When the adolescent is under the influence of alcohol, he or she may have temporary relief from stress and worries. Therefore, the alcohol allows the adolescent to feel free.

Gender also plays an important role in the effect of parental alcohol consumption on adolescent alcohol consumption, although the exact relation is not clear. Some studies suggest that male adolescents whose parents consume alcohol tend to consume more alcohol than female adolescents in the same situation (McMorris et al., 2002). Some studies suggest that what determines whether or not an adolescent will

consume alcohol is the sex of the parent that is consuming the alcohol and the sex of the adolescent that is witnessing the consumption of the alcohol (Chaoyang Li & Chou, 2002; Zhang et al., 1999).

The current studies on the effects of parental alcohol consumption on adolescent alcohol consumption vary a great deal. It is hard to find two studies that agree on the exact relation between parental alcohol consumption and adolescent alcohol consumption. Some of the studies place more weight on the direct effects of parental alcohol consumption, whereas other studies suggest that the indirect effects of parental alcohol consumption matter more. Some studies suggest that gender plays a major role in the effect that parental alcohol consumption has on the adolescent, but this is not a consistent finding.

Because there is such variation among the current studies, this study attempts to clarify the relation between parental alcohol consumption and adolescent alcohol consumption. I hypothesize that a parent's level of alcohol consumption will be strongly correlated with their adult children's level of alcohol consumption. To test this hypothesis, I compared the parent's levels of alcohol consumption with their adult children's levels of alcohol consumption.

## METHODS

### *Participants*

I collected data from 27 participants, 12 male and 15 female, ages 21-25. All of the participants were from the campus of the University of North Carolina at Charlotte. The participants were currently enrolled in a combination of classes on campus, including Anthropology, Psychology, and Sociology classes. The participants received no credit for their participation in this study, and they were free to discontinue their participation at any time without penalty and to remove any data that they had contributed from further analysis.

### *Materials*

In order to assess alcohol use, I constructed an Alcohol Use Survey (see Appendix 1). In order to construct the Alcohol Use Survey, I first thought about what makes people drink. Then I researched other surveys that deal with alcohol use to see the type of

questions they ask. Although I found these other surveys to be interesting, I decided not to use them in the Alcohol Use Survey. In the Alcohol Use Survey, the participants were asked to report how often they consume alcohol and the average number of alcoholic beverages they consume. In order to get information about the participants' parents, the participants were asked to estimate how often their parents consume alcohol and the average number of alcoholic beverages their parents drink. In order to control for extraneous variables I included questions regarding the influence of friends, siblings, and advertisements on the person's level of alcohol consumption.

### DESIGN AND PROCEDURE

When the participants entered the classroom in which the study was conducted, they were greeted. When all participants had arrived, they were told exactly what the study involved. The participants were then asked to read and sign a consent form that explains everything they would do during the study and how long it would take. After the consent forms were signed, the forms were collected and placed into an empty folder marked consent forms. The participants were then handed a copy of the Alcohol Use Survey for them to complete. In order to protect the participants' confidentiality, the participants folded their completed survey and placed it into a closed box.

### RESULTS

Table 1

<b>Parental Alcohol Consumption in Relation to Adult Child Alcohol Consumption</b>			
	<b>N</b>	<b>M</b>	<b>SD</b>
<b>Parent</b>	27	4.33	2.92
<b>Adult Child</b>	27	4.88	3.05

Table 1 contains the descriptive statistics. The data were analyzed with a Pearson correlation. The two variables were the parent's level of alcohol consumption and their adult children's level of alcohol consumption. These two variables were significantly correlated,  $r(27) = .57, p = .002$ .

### DISCUSSION

The hypothesis that parent's level of alcohol consumption would be strongly correlated with their adult children's level of alcohol consumption was supported. Many studies indicate that if a parent consumes alcohol, then their adult children will consume alcohol (Chaoyang Li & Chou, 2002; Cleveland & Wiebe, 2003; Hussong & Chassin, 1997; McMorris et al., 2002; Zhang et al., 1999). This current study agrees with this conclusion and takes it one step further by showing that the parent's level of alcohol consumption and their adult child's level of alcohol consumption are related. Children whose parents consume large amounts of alcohol have not learned how to properly handle their various emotions. In order for the adult child to handle his or her various emotions, he or she consumes large amounts of alcohol. This is mainly because he or she knows how alcohol makes them feel and they know how to react to the way the alcohol makes them feel (Hussong & Chassin, 1997; McMorris et al., 2002).

One limitation to this study is the small sample size. Another limitation to this study is that, due to the small sample size, the sample lacked racial diversity. Another limitation to this study is that it was correlation so we can not conclude that the parent's consumption of alcohol caused the alcohol consumption of their adult children. Another study should be conducted using more participants so that the results can be generalized to the public. It is recommended that parents not consume large amounts of alcohol in front of their children.

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Appendix 1:

**Alcohol Use Survey**

1. Does either of your parents drink alcohol?      Yes      No
  
2. How often do your parents drink alcohol?  
    Everyday    Once a week    Once a month    Once every few months    Never
  
3. On average, how many alcoholic drinks do your parents consume? \_\_\_\_\_
  
4. What do your parents drink the most? \_\_\_\_\_
  
5. Do you drink alcohol?      Yes      No
  
6. How old were you when you first started drinking alcohol? \_\_\_\_\_
  
7. How often do you drink alcohol?  
    Everyday    Once a week    Once a month    Once every few months    Never
  
8. On average, how many alcoholic drinks do you consume? \_\_\_\_\_
  
9. What do you drink the most? \_\_\_\_\_
  
10. How much do your friends influence you to drink?
  
11. How much do advertisements influence you to drink?
  
12. How much do your siblings influence you to drink?

# Exploring the Relationship Between Neuroendocrinology and Circadian Rhythm

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Imagine a young man walking slumberly along on a city sidewalk. The sun has gone down and, and streetlights dimly guide the path home from a long day of work. The man looks ahead to notice the bright headlights of a car turn the corner and speed toward him down the quiet street, traveling noticeably fast for such a restricted neighborhood. In an instant, the car swerves as if the driver has lost control of the wheel. The car is now heading down the sidewalk directly into path of the young man. Like a jolt of electricity, his entire body is thrown into a state of panic. This primal fear sets his heart racing, and he feels the blood shunt away from his upper and lower extremities. His breathing is rapid as his skin breaks out in a sudden cold sweat. No thoughts are going through his mind, only an instinct for survival. As the car approaches a few feet from impact, he leaps sideways into the air, falling into fetal roll against a building. The car barely misses him and squeals forward in a reckless manner.

Perhaps this young man was not the least bit aware of the underlying physiology that synchronized his body's state of excitement, nor should he care under the circumstances. Nonetheless, his metabolic process, increased heart rate and respiration, and his subsequent reactivity to the life-threatening event is owed to the explosive release of various hormones, neurotransmitters, and other elements engineered by his organ systems. The same physiological mechanisms that mobilize the body in threatening situations are cycling in much smaller concentrations on a daily basis in attempts to maintain homeostasis for all organ systems.

In most cases, secretion of hormones and neurotransmitters are signaled into circulation as a direct or indirect response to external stimuli. However, because of neurophysiological complexity, the endocrine and nervous systems are constructed with

the body's stored sugars to readily provide all cells with energy for skeletal muscle contraction and increased heart rate, even at the end of a long, tired day at work.

Desperate times call for desperate measures, and flight response is sometimes necessary, but the body's reactivity to this level of stress should function as a temporary state. Living in a long-term or constant state of high stress and fear could eventually separate the standard corticotropic cycle from circadian rhythm, causing adverse effects on the rest of the body (Van Cauter & Spiegel, 1999). Likewise, it is logical to assume that any long-term stressors on the body will affect the sleep-wake cycle, hormone production and secretion, and circadian rhythmicity. This is illustrated in studies that examine the effects of depression, alcohol, and obstructive sleep apnea (OSA).

Whether the stressors are internal or external, long-term implications are thought to be detrimental if left untreated, especially when neuroendocrine systems are unable to modulate within a predictable circadian rhythmicity. In children and adolescents diagnosed with depressive disorders, it has been observed that circadian activity becomes "dysregulated" (Teicher et al., 1993). Depression is marked by a loss of neurotransmitter regulation and, thus, is thought to affect circadian frequency for the release of hormones such as thyroid-stimulating hormone, melatonin, and cortisol. In younger patients not only is circadian amplitude blunted; they also showed signs of more rapid circadian cycling, closer to 12-hour fluctuations rather than 24 hours (Teicher et al., 1993). The administration of antidepressants is believed to reset the circadian rhythm in these patients.

Rosenwasser recently compared the effects of alcohol and antidepressants on circadian activity (2001). Symptoms of alcohol withdrawal mimic those

of depressed patients, perhaps because overuse of alcohol causes an irregularity in serotonin production. Interestingly, it is thought that alcohol might serve as an “antidepressant-like” treatment on the suprachiasmatic nucleus (SCN) or circadian pacemaker, in that it may temporarily increase serotonin levels. It is observed in humans, as well as animals, that alcohol consumption is most preferred during the night when they would otherwise be sleeping (Rosenwasser, 2001). Nonetheless, alcohol withdrawal disrupts other circadian processes such as one’s core body temperature and normal sleep-wake patterns, as seen in either phase advance (early decrease in body temperature during sleep) or phase delay (occurring later than normal) responses, both of which may also be seen in depressed patients (Rosenwasser, 2001). Other common occurrences are the early onset of rapid eye movement (REM) accompanied by a quicker metabolism for serotonin. Antidepressants are successfully used in resetting the circadian rhythm in most cases, but it is not absolute whether an abnormal circadian rhythm is the causal factor for depression or if depression is a stressor on circadian rhythm. Evidence seems to support the idea that depression and alcohol consumption and withdrawal are direct stressors on the pacemaker itself (Rosenwasser, 2001).

Perhaps another serious stressor on the circadian rhythm is obstructive sleep apnea (OSA). Indications for this are the physiological findings that researchers have observed in patients with OSA, including an insufficient supply of oxygen in the blood during sleep and the presence of excess carbon dioxide. It is suggested that those with OSA have an “abnormal hormonal regulation” contributing to the closing of upper airways (Beebe & Gozal, 2002). Since irregular breathing patterns disrupt the normal cycling through sleep stages, certainly there can be profound effects on the production of sleep-dependent hormones, particularly those that are sleep-stage dependent. For example, if OSA patients fail to spend enough time in uninterrupted slow wave sleep, time allowed for the production and secretion of the much-needed growth hormone is limited. This is only one of the many known restorative processes during sleep. Research shows that OSA not only results in sleep deprivation that affects cognitive ability but alters metabolic processes, causing subsequent neuronal

damage (Beebe & Gozal, 2002), all of which will inevitably influence sleep-wake patterns and/or circadian rhythmicity.

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