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Dispersion of Identity Meanings: Exploration and Implications

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Allison Michelle Cantwell

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Dissertation Committee:
Dr. Peter J. Burke, Chairperson
Dr. Jan E. Stets
Dr. Robert Hanneman

The Dissertation of Allison Michelle Cantwell is approved:

_____

_____

_____
Committee Chairperson

University of California, Riverside

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ABSTRACT OF THE DISSERTATION

Dispersion of Identity Meanings: Exploration and Implications

by

Allison Michelle Cantwell

Doctor of Philosophy, Graduate Program in Sociology
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Dr. Peter J. Burke, Chairperson

Identity theory conceptualizes identities as sets of meanings individuals attach to the self (Burke and Stets 2009). Individuals seek support for their identities in situations by acting in ways to obtain feedback about the self from others. This feedback is compared to one's identity meanings in situations. If the feedback matches one's identity meanings, individuals feel good. If the feedback does not match one's identity meanings, individuals feel bad and are motivated to change the situation to bring feedback into alignment with their identity meanings. This comparison process is conceptualized as a control system.

This dissertation expands upon the control system process of identity theory by adding a measure of tightness of control of an identity to the theory. Control systems can vary in how tightly or loosely they monitor a standard (Powers 1973). In identity theory, the standard is the set of identity meanings to be compared with meanings being monitored in the situation. Individuals will vary in how tightly or loosely they maintain those identity standard meanings. A measure of tightness of control was developed by asking individuals about the various ways they define the self for the student identity dimension academic responsibility. Including tightness of control in

the identity model will help researchers to better understand the identity control process because tightness of control is shown to influence how individuals experience discrepancies (what happens when feedback in the situation does not match one's identity meanings).

Key findings indicate that tightness of control of an identity influences the identity control process with respect to emotional output. Individuals with more tightly controlled identities experience more negative emotion in the face of discrepancy than individuals with more loosely controlled identities. This suggests that individuals with tighter control systems are more bothered when their identities are challenged in situations. While it is likely that a more intense emotional response would lead to a greater behavioral response, this link has not yet been established empirically. Based on past control systems research (Powers 1973), individuals with more tightly controlled identities should be more effective at correcting a discrepancy than individuals with looser control systems. Findings in the present study indicate that individuals with more tightly controlled identity meanings will express greater adjustment in behaviors to fix a discrepancy than individuals with looser control systems. This suggests a tighter control system is more effective at correcting a disturbance than a more loosely controlled system. The implications of the findings of this study, its limitations and future research are discussed.

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CHAPTER 1

INTRODUCTION

This dissertation expands identity theory by introducing the concept of tightness of control of identities. More broadly, identity theory describes how individuals manage identities in situations by using a control system approach (Burke and Stets 2009). Identities are sets of meanings that individuals attach to themselves. As individuals interact with each other, they assess feedback obtained from others to judge whether they are coming across in the situation as they intend. Individuals take the feedback they get from others (input) and compare it to their identity meanings (identity standard). If the meanings match, individuals feel good and if the meanings do not match, individuals feel bad and are motivated to change their behavior in the situation to align feedback with their self-view.

Identity theory describes the process individuals go through to assess whether or not their identities are being supported in a situation as a control system (Burke and Stets 2009). The control systems approach has been developed from early work describing how control systems are used to solve mechanical and engineering problems (Weiner 1948). More generally, a control system is designed to control the value or level of something. Control systems are used to control things like temperature in a room, speed of an engine, and in the case of identity theory, meanings in a situation. Each control system works by first having a set point that acts as the goal of the system. The system works to maintain or achieve that goal or set point. In a situation, the system takes a reading of the current state of the thing being controlled and compares it to the set point. If the current state and set point do not match, the system will adjust to change the current state of the system toward the set point. The above example is very general and can be applied to anything that can be controlled or changed in a situation. For example, identity theory discusses

how individuals control their behavior to influence meanings in situations so that they obtain feedback that matches their identity standard meanings.

The meanings one associates with an identity used to describe the self is their identity standard, or the set point of the control system (Burke and Stets 2009). Individuals desire feedback in the situation that supports or matches their identity standard (termed verification). Feedback in the situation comes by way of reflected appraisals, one's perceptions of how others rate the self in terms of relevant identity meanings. When feedback in the situation does not match one's identity standard, a discrepancy has occurred. In response to a discrepancy, individuals experience negative emotion, a decrease in self-esteem, and are motivated to change feedback in the situation through various pathways. Individuals can change their behavior in the situation, their interpretation of feedback from others, and/or can change the self-meanings associated with the identity in question so that the situational meanings match the identity standard. This process has been tested and supported within identity theory (Burke and Stets 2009).

In identity theory, any deviation from identity standard meanings is considered a discrepancy and the individual will act to adjust identity-relevant meanings in the situation to bring those situation meanings into alignment with one's identity standard. We know from past research that individuals experience greater negative emotion as the discrepancy increases (Burke and Stets 2009). In response, individuals' behavior changes to align self-relevant meanings in the situation with identity meanings. As a discrepancy increases, the amount of meaning change in the situation also increases. As more meaning change is required, individuals should enact a stronger behavioral response.

Since identity theory takes a control system approach, it is likely this control system acts as any other control system (Powers 1973; Weiner 1948). Control systems can vary in how tightly

they maintain the unit being controlled. For identity theory, the unit being controlled is self-relevant meanings in the situation (Burke and Stets 2009). Systems that are more tightly controlled, that is, systems that seek a more precise match between the feedback and standard, are more apt to recognize a mismatch between the feedback and standard (discrepancy). More tightly controlled systems will adjust more quickly so that a small discrepancy does not increase in size as further interaction takes place. Because a tighter system is more able to adjust quickly, these systems have been conceptualized as being more effective at correcting a discrepancy (Powers 1973).

While control systems theory has described the tightness of control of systems, identity theory has not yet investigated this concept and its influence on how individuals react to discrepancies. Understanding how the tightness of a control system affects how the system manages a discrepancy is important because it will allow us to understand the discrepancy process more precisely and will help us to identify differences between individuals that have varying tightness of control of identities. For identity theory, individuals monitor the meanings associated with a given identity or identities that are activated in the situation (Burke and Stets 2009). An identity is activated when it is enacted in a situation, when individuals monitor the meanings.

This dissertation extends identity theory by examining the influence of the concept tightness of control on the identity process. Tightness of control of control systems has been mentioned within identity theory as a potential cause of discrepancy of the system in that more tightly controlled systems are more sensitive to disturbances and therefore may be more prone to experiencing discrepancies (Burke 1991). While this is certainly possible that a more sensitive system experiences discrepancy more frequently, this dissertation focuses on the way a more

sensitive system (tight control) will react to a discrepancy in comparison to a less sensitive system (loose control).

It seems that tightness of control of a system has more of an impact on the outcomes of a disturbance. That is, the tightness of the system has more influence on recognizing discrepancies and correcting them. This dissertation applies this concept to the identity control process by examining how the mechanism of tightness of control can influence what happens when individuals' identity standards are not met.

Introducing the concept of tightness of control will help us to understand how discrepancy is experienced and responded to by individuals with identities that are more or less tightly controlled. If discrepancies are handled differently because their control systems differ, this will help researchers to better understand the dynamics of discrepancies. These ideas can also be useful in clinical settings by helping us to understand how individuals cope with information that does not confirm their self-view. Individuals with more tightly controlled identities are more sensitive to discrepancy and should feel more intense negative emotion than individuals with less tightly controlled identities. Since we know from past control theories that tighter control systems are more effective at correcting a discrepancy, individuals with more tightly maintained identities should also enact a stronger behavioral response to correct any discrepancy of their identity meanings in the situation (Powers 1973).

The above relationships are tested with a sample of undergraduate students from a large southwestern university in reference to the student identity. The student identity is comprised of meanings related to what it means to be a student. This group of individuals is uniquely qualified to report their experiences with being a student because they have been students for most of their lives and are confronted with the college student role frequently. This identity should be very familiar to them. A three-part online survey was administered to a large, lower division earth

sciences course throughout the first 5 weeks of the fall quarter in 2010. This course fulfills university breadth and/or science requirements for non-majors providing a sample of students from diverse majors.

The surveys focused on students' experiences with an exam in their course. Students were asked questions about their student identity, flexibility in identity meanings of the student identity, anticipated and actual grades on an exam, anticipated reflected appraisals from friends and parents as a result of their actual grade, emotional reaction to the exam, and study behaviors. These measures will allow investigation of tightness of control of an identity and its impact on the outcomes of the verification process.

Study Organization

The rest of this dissertation outlines the relevant theory, methods, results and implications of this study. Chapter 2 describes the underlying theory of this dissertation including a discussion of identity theory and its origins, dispersion of identity meanings, and current research relevant to this study. Following this discussion, hypotheses are outlined. Chapter 3 includes the research methods used to test the hypotheses outlined in Chapter 2. Chapter 4 presents the analysis and findings for each of the proposed hypotheses. Chapter 5 discusses the implications of the findings, the limitations of the study, and suggestions for future research.

CHAPTER 2

THEORY

This study expands the perceptual control system framework of identity theory (Burke and Stets 2009) by exploring the concept of sensitivity to feedback from others when that feedback does not match one's self-view. One's sensitivity to feedback is theorized to influence how individuals react to feedback. It is explained below that sensitivity to feedback within the perceptual control system is related to the various meanings one associates with the self. Theory is set forth suggesting sensitivity of the identity control system is a function of the importance of an identity to the self, the likelihood an identity will be enacted across situations, and the connectedness of an identity to others.

Before discussing the details of identity theory and sensitivity to feedback, it is necessary to provide an explanation of the origins of identity theory. The perceptual control focus of identity theory (IT) describes the cybernetic process individuals use when maintaining identity meanings in situations. IT assumes individuals have a self, are able to communicate with others using symbols that have shared meaning, attribute meaning to the self in the form of multiple identities, and have the ability to engage in reflexive thought. These assumptions are rooted in the theory of James (1999 [1892]), Mead (1967 [1934]), and Cooley (1964 [1902]) that are a part of the symbolic interactionist tradition. The control system aspect of IT draws from the work of Powers (1973) outlining the way individuals control perceptions in situations.

Origins of Identity Theory

The perceptual control focus of identity theory (IT) draws from symbolic interactionism and cybernetics to describe the process individuals go through as they try to obtain support for their self-view in interaction with others. Symbolic interactionism (SI) outlines the way individuals develop a sense of self and communicate with others through a series of symbols and

gestures that carry meaning. SI focuses on the ways in which individuals use symbols to understand, create, maintain and sustain meaning in interaction. It is through symbolic interaction with others that individuals develop a sense of self, come to understand relevant societal and self meanings, and are able to sustain the social structure. These meanings are shared among individuals and facilitate interaction. The area of cybernetics uses a control system model to describe maintenance of perceptions. These ideas will be described below.

Symbols[1]

Symbols are anything that represents or stands for something else. Individuals learn the meanings of symbols through their experience with them. Images, words, sounds, and gestures are all examples of symbols. We can say that symbols carry meaning and that this meaning comes to be associated with a symbol through our experiences with them. That is, individuals learn the meaning of symbols by observing interaction and through interaction with others. For example, the word hammer, an image of a hammer, and the sound a hammer makes are all symbols for the object hammer, an object with a metal head and a wooden handle used to hit objects or used to pry depending on the part used. Individuals use symbols to communicate their understanding and their intentions to others within a situation.

There is a distinction between symbols and significant symbols in interaction (Mead 1967 [1934]). Since symbols carry meaning, they become stimuli in situations and evoke a response from the individual. People see a symbol, interpret it, and react to it. If I see an individual approaching me, I take in information about that person by looking at what they are wearing, their facial expression, and other cues about them. These symbols indicate to me whether or not this person is safe to talk to. If the person looks unkempt and has a scowl on her face, I will likely try

[1] The word symbol may be used interchangeably with object, image, word, sound, gesture, stimulus, or behavior – it is something that elicits meaning when presented to an individual.

to avoid interaction with that person. The scowl on her face tells me she is not friendly. I have learned to associate a lack of friendliness to a scowl because of previous encounters with scowling individuals.

A conversation of symbols entails individuals simply reacting to each other without processing the intention of the gesture. If somebody were to bump into me, I may react by pushing them away (gesture) or by saying something (language). Both of these symbols express that the person is too close to me or has disturbed me in some way. If I were to push the individual, s/he may push back in reaction to my gesture. In this situation, we are only reacting to the situation without processing the other individual's reason for pushing. As individuals gain more experience with interaction, they develop the ability to process symbols in such a way that they can understand the intention of others. When symbols evoke the same response in the self as in others, we come to call these significant symbols.

Significant symbols are those that carry meanings that are shared with others in the situation. Individuals can both understand the intent of the use of a symbol and can anticipate the reaction to it (Mead 1967 [1934]). Language is an example of a set of significant symbols. Language is a set of words that follow rules of grammar and syntax for proper use (Mead 1967 [1934]). Words carry meanings that are relatively constant within a culture and are understood to mean the same thing to many individuals sharing that culture. These shared meanings allow smooth interaction and communication to occur between individuals. When significant symbols are used, we make our understanding of that symbol known and express our intent in the situation. This gesture or response in turn, becomes a stimulus to the other person. The individual will interpret our gesture and will adjust his or her response in a manner that shows s/he understands our intent. As we interact with others, we adjust our responses toward the symbols

used in the situation. In this way, interaction is a conversation of significant symbols that are adjusted to the stimuli and meanings in the situation.

For example, if I see a friend as I am leaving campus, I may signify my departure by waving my hand. If my friend understands my gesture, she will know that it means good-bye and will respond by waving back or saying "Good-bye." If my friend misunderstands my gesture as waving "Hello," she may say "Hello" to me. This symbol alerts me to the misunderstanding. I will have to re-establish my intended meaning in the situation by adjusting my behavior. I will enact a stimulus that will show I understand her behavior and, in turn, change the meaning of the situation. I may simply say, "See you later," to show that I am leaving and do not have time to chat. Here, we can see that conversation and interaction involves the processing of symbols and adjusting one's actions to fit the actions of others.

Development of Mind and Self

In order to engage in interaction with others through the use of significant symbols, one must develop the mind. The development of the mind is a social process that occurs as individuals learn to use and understand symbols in interaction with others (Mead 1967 [1934]). Individuals come to learn and understand meanings associated with symbols through reinforcement and experience as they adapt to situations. As infants and children, we react to stimuli with only our own intensions in mind. We lack understanding of how our actions will affect others. We are capable of having a conversation of gestures but not a conversation of significant symbols. A conversation of gestures is one of reactions to stimuli without forethought and without an understanding of the other's intensions.

As individuals gain more experience with symbols and interaction, they begin to understand how their actions impact those of others. Once an individual is able to understand and anticipate the meaning a gesture or symbol will call up in another, the symbols become

significant. The mind is developed when an individual can participate in a conversation of significant symbols. That is, the individual can anticipate the meaning others will interpret from one's own gestures in situations and can control his or her actions so as to align them with the meanings in the situation.

As one engages in the use of significant symbols, they are also able to interpret the gestures of others, using these gestures as stimuli for response. Individuals can inhibit their own responses, rehearse responses in the mind, can visualize the consequences of their imagined action, and can select appropriate responses when the mind is developed. In the process of the mind, we are able to learn the meaning of gestures and use them to achieve our goals. Possessing the ability to think about and reflect upon one's actions including how these actions influence the situation is a necessary part of symbolic interaction and aids in the development of the self.

Once an individual has an understanding of significant symbols, one begins to take the role of the other (Mead 1967 [1934]). The process of taking the role of the other or engaging in role-taking is based on the concept of the looking-glass self (Cooley 1964 [1902]). The looking-glass self describes the way individuals use feedback from others as a way to monitor one's own actions in situations. The looking-glass self operates in three steps. We first imagine how we appear to others, we then imagine their reaction to that imagined appearance, and finally, we emotionally react to that perception. Our reaction to the perception of how others see us then influences our action in the situation.

Through this process, we are stepping outside the self and examining the self as if it were an object. Through taking the role of the other, we are able to objectively evaluate our conduct in situations. We are essentially stepping into somebody else's shoes in order to evaluate the self from their perspective. Through treating the self as object, we are able to adjust our behaviors to fit within the context of the situation. The process of role-taking helps individuals to develop a

stable sense of self because we form an understanding of the meanings and associations others make about us through interpretation of their reactions to us. Internal reflection on one's potential actions can aid in the selection of appropriate behavior and help one to anticipate the reactions of others to bring about or avoid certain consequences.

Reflexivity, the ability to step outside the self and understand the self as an object, is an important component for self-evaluation (Mead 1967 [1934]). By being able to take the self as an object, to step outside the self and evaluate the self's actions objectively, we are able to understand the impact of our own actions in the situation. This process allows the individual to anticipate potential reactions from others, adjust one's perceptions in the situation, and to better select behavior so that it conforms to the relevant meanings in the situation.

Like the mind, development of the self is a social process (Mead 1967 [1934]). Development of the self occurs through the play stage and the game stage. Individuals take the role of the other by imagining their own actions from the perspective of other(s) in the situation. In taking the role of the other, the individual is an object and can be examined or reflected upon. To become self aware or conscious of one's self, the individual must engage in taking on roles and reflecting upon those roles.

In the play stage, individuals take the role of another person and act as if s/he were the other (Mead 1967 [1934]). This typically occurs during childhood where a child may play as if s/he were a fireman or a parent. A child can only act out one role at a time. In this case, taking the role of the other involves being a specific other. The child may act out both, the role and its complimentary role. In the example of playing at the fireman role, the child may also play the role of victim being saved from a fire. Because the child is playing at these roles as if s/he is both self and the other in the situation, s/he can only maintain a conversation of roles between one or

two positions. As s/he begins to understand how roles relate to each other s/he will transition to the game stage.

The game stage requires that the individual account for many others in the situation (Mead 1967 [1934]). The child learns to understand how each of the roles in the situation relates to each other according to a set of rules or standards. This development of an organized set of standards becomes the generalized other, or the attitudes of the community or group to which one belongs. The generalized other is the set of standards the individual references when anticipating one's own behavior and the responses of others in a situation.

For Mead (1967 [1934]), people belong to several social groups that allow the potential for the diverse relationships and standards we possess. The standards one uses to judge one's own action and the reactions of others are comprised of both the generalized other and the individual attitudes of the self and others in the situation.

The evaluation of one's actions and the actions of others in various situations creates a set of standards and values. The generalized other is a set of internalized standards for a group. These standards come to be known by the individual through experience with others in society and are reinforced through interaction. Different groups have different standards for action and interaction so it is likely that any given individual will have internalized many generalized others. A person may have a generalized other for how to act at school and may have another set of standards for how to act with friends. Internalizing a set of standards allows the individual to engage in reflexive thought without the presence of others. Instead of having to rely on actual feedback from others in a given situation, one can reference the generalized other to evaluate one's own action and anticipate reactions by others in selecting what behavior to enact.

Self as Process: I and Me

The self operates as a process with two components, the I and the Me (Mead 1967 [1934]). The self is both subject (I) and object (Me). The I represents the spontaneous part of the self that initiates action in situations while the Me is the reflexive part of self that evaluates and controls one's own behavior in the situation. Without the I, there would be no possibility of spontaneous or novel action because every action would be evaluated against the standards of the situation by the Me before occurring. By conceptualizing the self as both spontaneous and reflexive, novel action can occur. The Me evaluates the actions of self by taking the role of the other(s) in a situation and accounting for standards that comprise the generalized other. Behaviors can therefore be adjusted to align with the situation. When the I initiates action, the Me acts to control that action through an awareness of potential responses associated with those actions. Persons use these internalized cultural and situational standards to guide behavior and anticipate the reactions of others.

Multiple Selves

As individuals develop a sense of self through interaction with others, they come to acquire many selves. An individual can have as many selves as the number of relations they have with others in society.[2] An individual is conceptually partitioned in such a way that s/he can be a student, a daughter, a teacher, and a friend. Each one of these roles represents what Mead (1967 [1934]) and James (1999 [1892]) would call a self. The myriad selves come together to represent one's global self. As individuals gain more positions within a society, they become linked to the greater social structure through these roles. As a society becomes more complex, requiring members of the society to take on more diverse roles and positions, the individual becomes more

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[2] Having multiple selves relates directly to identity theory's conception of individuals having multiple identities (Burke and Stets 2009). Instead of having a self for every type of relationship individuals carry, they have an identity for each. This idea is discussed more fully later.

complex. It is from this that we have come to understand that individuals reflect the complexity of society. In turn, interaction with others maintains the structure of society. While society acts to constrain and shape the interactions of individuals, the interaction of individuals serves to maintain society.

Self-Esteem

As discussed previously, individuals internalize sets of standards or expectations for socially acceptable behavior in situations (Mead 1967 [1934]). Individuals tend to adjust their behavior in situations so that it fits into the meanings associated with stimuli presented by others. James (1999 [1892]) takes this idea one step further in discussing the outcome of such a comparison. Individuals gain and lose self-esteem by engaging in a comparison between their standards (pretenses) and their actual behavior in the situation. Self-esteem can be described as positive self-evaluation. If one's standards are under-achieved, one's self-esteem declines. If one's standards are over-achieved, one's self-esteem increases. Individuals are motivated to maintain and increase self-esteem through meeting their goals in situations.

Structural Symbolic Interactionist View of Self

Identity theory is rooted in structural symbolic interactionism with a focus on the roles individuals occupy (Stryker 1980). This view of the self draws heavily from Mead's (1967 [1934]) notion that self reflects society. While individuals learn meanings and expectations associated with various roles they play in situations, they both are constrained to act within those standards and are able to shape the standards in the situation by selecting relevant meanings. Individuals form associations with each other through the roles they take on. A role is a set of expectations associated with a societal position an individual can take on. Roles can be ascribed or achieved. Ascribed statuses are bestowed upon the individual at birth and are generally unchanging. One's sex and race are examples of ascribed statuses. Achieved statuses are roles

that one takes on by choice or through merit. Examples of achieved roles are college professor, graduate student, and firefighter.

Each role has a complimentary counter-role that helps to situate and define it within the social structure (Stryker 1980). One cannot be a mother without having a child; one cannot be a professor without any students. Roles are parts of the structure of society and individuals become tied to the social structure through taking on these roles. In this way, an individual's self-concept reflects the complexity of the social structure through their ties to various roles. Early identity theory focuses mainly on role identities but we have since expanded our discussion of identities to include person and social identities (Burke and Stets 2009).

Meaning

Meaning is an important concept in symbolic interactionism and identity theory (Burke and Stets 2009). Meaning can be denotative or connotative. Denotative meaning refers to the definition of a symbol while connotative meaning refers to an intention or implied meaning associated with a symbol (Osgood, Suci and Tannenbaum 1957). We are most concerned with the connotative meaning of symbols in both interaction and when discussing self-meanings.

We know from the discussion above that members of society share attributions toward symbols; that significant symbols carry the same meaning for the self and other in interaction (Blumer 1986 [1969]; Mead 1967 [1934]). Meanings associated with objects and symbols are learned through reinforcement and one's experience with them. Objects and symbols are stimuli in situations. Individuals interpret the meaning of the stimulus and select behavior in response to that meaning. This response carries its own meaning and becomes a stimulus to the other(s) in the situation creating a conversation of significant symbols. Meaning is revealed in one's response to a situation (Mead 1967 [1934]).

The above process reveals that meaning is a mediation process between the initial stimulus (symbol) and one's response to it (behavior) (Osgood, Suci and Tannenbaum 1957). Individuals are concerned with the connotation of symbols in the context of the situation. What does it mean if an individual waves their hand? One may attribute friendliness and welcoming to that gesture and in return, may wave back. The exact behavior selected will be a function of the meaning associated with the symbol presented. One's response is often aligned with the meanings associated with the symbols, people, and setting that create the context of the situation (Heise 1979; MacKinnon 1994).

The stimulus/response process is mediated by two stages: decoding and encoding (Osgood, Suci and Tannenbaum 1957). Decoding involves interpretation of the stimulus in the context of the situation. Encoding is the process by which one's interpretation of the stimulus is transformed into behavior. There are as many meanings for a stimulus as there are behavioral responses. That is to say that a stimulus can have many meanings. Since many individuals have similar experiences with stimuli, they will come to associate similar meaning with them. These similar associations are generally stable across individuals in a given culture.

Meaning, in the sense of this study, is aligned with what Osgood et al. (1957) term psychological meaning, the association of symbols to situations and behaviors on a connotative level. Meaning varies along many dimensions. Dimensions of meaning are distinct clusters of meaning associated with a symbol. For example, the student identity has four clusters of meaning (dimensions): academic responsibility, intellectual curiosity, sociability, and personal assertiveness (Reitzes and Burke 1980). Some of the meanings associated with the intellectual curiosity dimension are: studious, competitive, and open-minded. While many meanings are associated with what it means to be a student, these meanings are clustered into sets. Each set of

meanings (academic responsibility, intellectual curiosity, sociability, and personal assertiveness) form the dimensions associated with what it means to be a student, the student identity.

Dimensions associated with a symbol are conceptually arranged in semantic meaning space of N-dimensions. If we were to graph the dimensions for the student identity, we would have a graph with four axes, one for each dimension. The meaning for a symbol can be represented as a point in N-dimensional meaning space (Osgood, Suci and Tannenbaum 1957). This point will represent the symbol's meaning on each axis simultaneously. Meaning along a dimension both varies in direction (where it falls along an axis), and intensity (distance from the origin). Direction refers to the reactions elicited by the stimulus, overzealous instead of meek for example. Intensity refers to the distance from the origin in semantic space such that greater distance from the center of all axes denotes a more intense reaction along those relevant dimensions of meaning. In this case, very overzealous would be a more intense reaction than somewhat overzealous.

Control Systems

The perceptual control focus of identity theory not only draws from the symbolic interaction framework, it also draws on ideas from the area of cybernetics and control systems for its explanation of identity maintenance. The area of cybernetics was originally developed to help engineers solve problems of controlling and regulating output of mechanical systems through the use of feedback (Carver and Scheier 1998; Weiner 1948). Most broadly, a control system involves four elements: input, comparator, set point or standard, and output. The input function brings information about the element being controlled into the system. The set point or standard is the goal in the system, the value the system seeks to maintain. The comparator is a mechanism

that compares the input to the set point[3]. This comparison results in one of two outcomes: the values being compared are different, or they are the same. If the values are the same, the system continues, the output does not change. If the values are different, the system will adjust the output.

Originally, systems were developed to adjust input to achieve and control the output of a system (Weiner 1948). Systems operate using negative feedback, meaning the input is adjusted to counteract the problematic state of the system. If we think about a steam engine as the system in question, the set point will be to maintain a certain speed, the input will be the amount of steam fed into the system and the output will be the actual speed of the engine. If the engine is too slow (output), this information is fed back to the input so the amount of steam fed into the system is increased to speed up the engine. Similarly, if the engine is going too fast, feedback will result in decreasing the amount of steam fed into the system and the engine will slow. This idea of negative feedback, or feedback used to diminish a discrepancy, is opposite to the idea of positive feedback loops in which a system seeks avoidance of a specific standard. Positive feedback is a discrepancy amplifying system in which the goal of the system is to move away from the reference value (Carver and Scheier 1998). The control system in identity theory and perceptual control theory (discussed below) are both negative feedback systems.

The steam engine control system and other types of mechanical control systems are built to produce a steady output by controlling the input fed into the system. In the above example, the amount of steam (input) is controlled to keep the engine at a steady speed (output). When applying these concepts to human behavior, the input to the system becomes one's perceptions in the situation and the output of the system is behavior. Nevertheless, individuals seek to maintain a

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[3] Originally, the control system was designed to control output through varying levels of input. In this case, output was compared to a set point and input was adjusted (Weiner 1948). This is explained below.

steady understanding of situations they encounter. Rather than maintaining a steady set of behaviors (output), individuals control their perceptions of the situation (input) through adjusting their behaviors in the situation (Powers 1973). In this way, the control system of engineering and mechanics is adjusted from a system that monitors output and adjusts input to a system that monitors input (perceptions) and adjusts output (behaviors). Both systems are identical and vary in perspective, whether it is input or output that is controlled.

Powers (1973) applies the cybernetic control system to humans and emphasizes that individuals seek to control their perceptions in situations. This system contains the same parts of the control system mentioned above (standard, input, comparator, and output). The goal or standard in the perceptual control model is to maintain one's perceptions in the situation. That is, individuals have goals in situations and have expectations for how situations should be carried out. These expectations or goals are used as standards to which the actual situation is measured. This may be best explained using a classic perceptual control example in which an individual seeks to keep a knot tied between two rubber bands inside a circle. There are two individuals positioned across from each other in this situation, each holding onto one of the rubber bands tied together.

One individual (P1) is instructed to keep the knot of the two rubber bands inside a circle (standard) (Powers 1998). The other individual (P2) introduces a disturbance into the situation by pulling their rubber band and moving the knot outside the circle. As P2 does this, P1 sees the knot moving outside the circle. This perception is the input of the control system. The comparator compares the input (knot is outside of the circle) to the standard in the situation (knot is inside the circle). Since these two bits of information do not match, the system has registered a discrepancy (perception does not match standard). P1 will adjust his behavior by pulling his rubber band (output) to bring the knot back into the circle. As P1 pulls on his rubber band, P2 continues to add

disturbances into the situation by continuing to move his rubber band. P1 will continue to adjust his behavior, the force put on his rubber band, to ensure the knot tied between the two rubber bands stays within the circle. Within perceptual control theory, the maintenance of perceptions occurs through enacting any number of behaviors. The exact behaviors used to change perceptions in the situation do not matter. All behaviors enacted are enacted in an effort to correct a disturbance in a situation and there are many different behaviors that can aid in the achievement of that goal.

Identity Theory

The perceptual control focus of identity theory (Burke and Stets 2009) is a control systems theory that describes how people monitor identity-relevant self-meanings in situations as they interact with others. Identities are seen as self-schemas, ways of defining the self that influence how a person will interpret or frame the situation (Stryker and Serpe 1994). An identity is a set of meanings that describes the self. Similar to James (1999 [1892]), identity theory (Burke and Stets 2009) posits that people have multiple identities rather than multiple selves. As discussed previously, a person has a self, a sense of who one is. The self is divided into many parts, or identities that relate to the different aspects of the self that have been developed through interaction with others. Identities are maintained for every characteristic, role position, and group membership an individual has. This allows different identities to be activated within identity relevant situations and for an individual to maintain the same meanings for a given identity.

There are three bases of identity: person, role, and social. Person identities describe the self as a unique individual and may include the identities of controlling, caring, or hardworking, for example. Role identities describe the self in a role such as student, fireman or knitter. Social identities describe the self as a member of a group or social entity such as a member of the Catholic church (Catholic), member of the American Sociological Association, or as an Asian

American. Though each person has many identities, not all are relevant in every situation. Some identities are enacted in situations while others lay dormant until they are called up in a situation. An identity is relevant in a situation if the meanings associated with that identity are also associated with the situational setting (Heise 1979; MacKinnon 1994)

Situations also carry meaning. Identities carrying meaning congruent with a situation are relevant and are more likely to become activated, enacted, and controlled (Burke and Stets 2009). As mentioned above, the meanings in the situation and the individuals present activate relevant identities within the self. Only identities active in the situation are controlled.

For example, whenever I encounter a fellow classmate or professor in my department, my student identity is activated. We may talk about my progress on my degree or progress on a publication. Discussing this topic may also activate my person identity of hardworking because I work hard at academic-related tasks. I may discuss examples that demonstrate how much of a hardworking student I am by talking about how much I work on my tasks or how many research papers I am working on.

When an identity is enacted in a situation, a control loop is established (Burke and Stets 2009). This control system is responsible for monitoring meanings in the situation and comparing those meanings to one's identity meanings, also called the identity standard. Meanings in the situation are referred to as perceived situational meanings. As we interact with others in situations, we are constantly interpreting their body language, facial expressions, tone of voice, and what they are saying. One's interpretation of these cues becomes one's perception of the meanings in the situation, or perceived situational meanings. These meanings are monitored by the control system described below.

The goal, in identity theory, is to maintain one's perceived self-relevant meanings by comparing them to meanings held in the identity standard (Burke 1991; Burke and Stets 2009).

Individuals constantly monitor the feedback of others in the situation (identity-relevant meanings in the situation) to ensure they are coming off in the situation in a manner that is consistent with their identity meanings. The identity control system is comprised of four parts: a) the identity standard, b) input, c) comparator, and d) output. Figure 1.1 displays the identity control system. The cybernetic control process operates subconsciously and acts to evaluate the degree of support identity meanings are obtaining in the situation.

Figure 2.1 Identity Control System (Stets and Burke 2011)

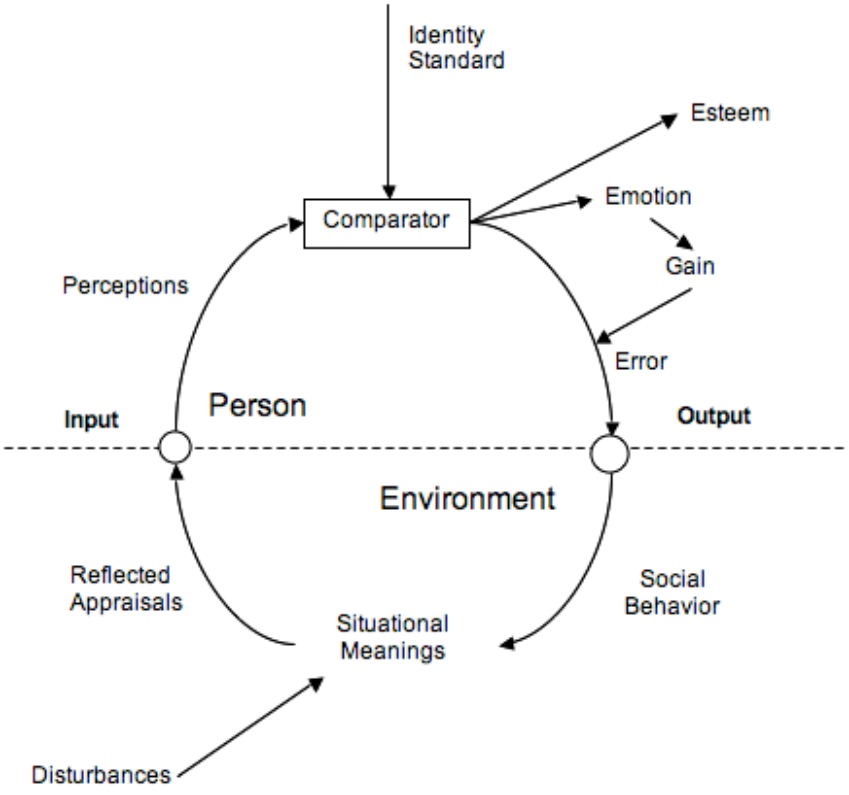

Figure 2.1 is split in half by a dotted line. This line separates the components of the system occurring in the situation, labeled environment, from the components occurring within the individual, labeled person.

Identity Standard

An identity standard is the set of N-dimensional meanings that one uses to define the self in respect to the role, person, or social identity being enacted in the situation. The identity standard is the set of self-meanings activated and controlled in the situation for a given identity (Burke and Stets 2009). Each set of identity meanings are comprised of shared, common meanings and idiosyncratic meanings (McCall and Simmons 1966). The idiosyncratic meanings in one's identity allow individuals leeway in how they enact their identities. The shared meanings for a given identity are generally stable across a culture allowing individuals to understand the meanings associated with the identities others are taking on.

For example, the meaning dimensions associated with the student identity are: intellectual curiosity, sociability, academic responsibility, and personal assertiveness (Reitzes and Burke 1980). Meanings associated with intellectual curiosity include: studious and competitive. An individual defining the self as very intellectually curious would likely rate the self very high on studiousness and competitiveness and may spend a lot of time studying on his/her own. This person may also be reluctant to study with classmates so that s/he can avoid helping others to maintain a competitive edge over him/her. These behaviors carry meaning congruent with being studious and competitive and therefore are aligned with intellectual curiosity. Meaning not typically associated with intellectual curiosity, and therefore qualifying as idiosyncratic, may be pessimistic. An individual also maintaining pessimism along with studious and competitive may berate herself if she does not study enough out of fear of failing. While others may not be able to understand this behavior in the context of intellectual curiosity, they will come to associate it with this person the more she interacts with them.

Input

Input from the situation is obtained from feedback provided by the self and others relevant to the situation (Burke and Stets 2009). The input in the identity model can be in the form of self-appraisals or reflected appraisals. Self-appraisals are one's own evaluation of how the self is acting in the situation. Reflected appraisals are one's perception of the feedback others provide. Feedback from others is in the form of direct appraisals. Direct appraisals come in the form of direct, immediate feedback about how the self is acting in the situation. These appraisals are interpreted by the actor and become reflected appraisals; how the actor thinks others evaluate him/her in the situation. When important others are not present in the situation, one can draw from past experience to anticipate how others would react to one's actions. In this case, reflected appraisals can also be in the form of one's anticipated reaction of others not present in the situation.

For example, in deciding to choose between going out to a party on a Friday night or staying at home to study for an upcoming an exam, a person may think about how his/her friend(s) would react. On the one hand, one's more studious friends would support the decision to stay home and study since this behavior is congruent with the student identity. On the other hand, one's social friends may not support this decision and call the individual a nerd or party pooper because s/he is failing to support his/her socializing or partying identity. If the self seeks to support the student identity meanings s/he may decide to stay home because one's studious friends would support that decision. If the self seeks to support their socializing or partying identity, s/he may decide to forgo studying in favor of attending a party to obtain support for that identity by his/her friends.

Comparator

Feedback from these varying sources[4] is compared to the meanings held in the identity standard within the comparator. The comparator is the mechanism that compares the situational meanings gathered from reflected and self-appraisals (input) to relevant self-meanings in the situation (activated identity standard). If these meanings match, one has achieved identity verification and will feel neutral to positive emotion and will continue acting in the situation to maintain support for that identity. If the meanings do not match, the comparator registers a discrepancy. The self will experience negative emotion and will engage in a strategy to correct the discrepancy to bring perceived situational meanings in line with one's identity standard. The magnitude of the discrepancy influences the magnitude of the output in the model. In general, the larger the discrepancy, the larger the output (Burke and Stets 2009).

Output

The output in the identity control model is a combination of positive or negative short-term emotion, an increase or decrease in long-term self-esteem, and immediate corrective behavior (Burke and Stets 2009; Cast and Burke 2002; Stets 2003). It should be noted that output to the system occurs whether verification or discrepancy occurs. Output is different depending on the magnitude of discrepancy. If the discrepancy is zero (verification), the individual experiences neutral emotion, a potential increase in self-esteem (Cast and Burke 2002), and enacts behavior aligned with identity meanings to maintain verification (Reitzes 1981).

Emotion and self-esteem are direct outcomes of the comparison between perceptions of the situation and self-meanings. Previous IT research finds that discrepancies predominantly lead

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[4] It has been suggested that various forms of feedback are weighted by importance of the source to the self or by importance for supporting that identity (McCall and Simmons 1978). It is probable that feedback from others may vary in importance depending on the identity being evaluated. A student friend may be more important in evaluating one's student identity rather than one's knitting identity, for example.

to feelings of negative emotion (Burke and Stets 2009). In the few cases where positive emotion has been an outcome of discrepancy, it has been a function of over-reward indicating over-achievement on a task (Stets 2003; Stets and Asencio 2008; Stets and Osborn 2008). While the initial response to over-reward may be positive emotion, research finds that long-term over-reward ultimately leads to negative emotion since situation meanings do not match self-meanings and result in a discrepancy (Stets and Asencio 2008; Stets and Osborn 2008).

Self-esteem has been researched within identity theory as a resource, outcome, and motivation for the identity process as well (Cast and Burke 2002).[5] When verification is achieved, self-esteem increases, individuals feel more worthy and efficacious in the activated identity and feel good about the self. When an individual experiences a discrepancy, s/he experiences a decrease in self-esteem. S/he will feel less able to maintain the identity and less worthy. Existing levels of self-esteem also influence the comparison process. Levels of self-esteem can buffer the outcome of the comparison process because it can be used as a resource in situations. When an individual receives discrepant feedback, s/he can draw on their self-esteem to soften the blow so they do not feel as bad. Lastly, self-esteem can also be a motive in the identity process. Individuals looking to increase their self-esteem will seek situations in which an identity is more likely to be supported since this increases the likelihood that s/he will gain more self-esteem from successful identity enactment.

Behavior[6] (output) can be altered to bring situation meanings into alignment with self meanings. Overt behavior is one way to change perceptions and meanings in the situation. When this strategy is chosen, the type and strength of behavior is used to counteract the disturbance. If

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[5] This dissertation focuses on emotional output instead of self-esteem. For information on identity theory and self-esteem, see Cast and Burke 2002 or Burke and Stets 2009.

[6] Behavior here is defined as any act used to change perceptions in the situation whether covert or overt.

an individual is deemed a worse student than he feels he is, he will engage in behaviors that will change the feedback of others toward his identity standard. For example, if a student sees himself as an A student and studies for 10 hours for his exam but earns a C on his mid-term, he may decide to study longer for the next exam in an effort to increase his grade and to verify his self-meanings of being a student that earns As.

Overt behavior may not always be the chosen strategy for getting rid of a discrepancy. An individual can adjust their perceptions of feedback (input) in the situation by changing their interpretation of feedback, they can adjust their identity standard[7], engage in various strategies that may rationalize or dismiss the feedback, or s/he can abandon the identity in the situation in favor of a more fitting set of identity meanings (Burke 2006; Burke and Stets 2009; McCall and Simmons 1966). This control process is continuously operating in a situation as actors work to align meanings in the situation with their identity standards.

Some identities individuals possess have meaning structures that are not compatible and will conflict if activated together in situations. In most cases, identities that conflict will not be activated together. If identities that conflict are activated together over time, the meanings of both likely move toward each other to facilitate agreement. This follows from the concept of identity change occurring due to long term discrepancies. If an identity constantly experiences a discrepancy, the meanings will shift toward the feedback it is receiving. In this case, feedback would be aligned with the identity it conflicts with (Burke 2006; Burke and Stets 2009).

Properties of Identities

Identities are organized into hierarchies of salience, prominence, and commitment (Burke and Stets 2009; McCall and Simmons 1966; Stryker 1980). Each hierarchy describes which

[7] Changes in the identity standard generally happen slowly over time with repeated non-verification of an identity (Burke 2006).

identities are more important to the self (prominence), which identities are more likely to become activated (salience), and which identities are more costly to abandon (commitment). Each of these hierarchies influences the others such that identities with more salience are generally more important and are more committed to by the individual (Burke and Stets 2009).

Prominence

The prominence of an identity is a function of how important the identity is to one's self-view (McCall and Simmons 1966). It has been characterized as the ideal self; the person one would like to be. Importance or prominence of an identity to the self is based on the amount of reinforcement received when enacting the identity and how much of the self is staked in the identity; the amount of resources one has invested in maintaining the identity. If one has invested a lot of time and energy into maintaining an identity, it is likely to increase in prominence. Identities that are supported by others and gain extrinsic and intrinsic rewards are more prominent. Extrinsic rewards are in the form of praise, money, status, and other valued tangible or non-tangible items from others. Intrinsic rewards are obtained from one's own body and include sensations, efficacy, physical change, and the like. Emotion would be an example of a sensation obtained from the identity process that would potentially influence the prominence of an identity. If one were to feel bad frequently after enacting an identity, that identity is likely to decrease in prominence to the self. The amount of social support one obtains for enacting an identity can also impact its prominence. If an identity is not supported often, it will also likely decrease in importance.

Salience

Salience is the probability that an identity will be activated or enacted in a situation (Stryker 1980). Identities higher in the salience hierarchy have a higher probability of being enacted across many different situations. The higher an identity is in the salience hierarchy, the

more likely individuals will interpret various situations as relevant to that identity. Persons will actively seek opportunities in which to act out a salient identity.

Commitment

Commitment to an identity refers to the way in which the identity is connected to others within the social structure and consequently, the cost one would incur for abandoning an identity or playing out an identity improperly (Stryker 1980; Stryker and Serpe 1994). Commitment to an identity is a combination of extensive and intensive ties. Extensive commitment refers to the number of others one is tied to *because* s/he possesses a role identity. If one were to abandon the role, s/he would lose contact with and support from people tied to the self through only that role. For example, new member of a rugby team is tied to 20 other members of the team. If s/he were to abandon being a part of the team, s/he would lose contact with those 20 members.

Intensive commitment describes the depth of the ties with individuals tied to the self because of the possession of an identity. In our rugby example, belonging to a team for a short period of time would create a few shallow ties among team members. Abandoning the identity shortly after joining the team may not affect the individual as much as if s/he were on the team for a few years. Belonging to the team for a longer period of time would provide opportunities for deeper ties with others. Abandoning those ties would be difficult and cause more distress in an individual because those individuals are more important to the self. The greater the cost associated with losing ties to others, the more one has invested in an identity and the more commitment one has for an identity (Stryker 1980).

Activation

Placement of an identity in the prominence, salience, and commitment hierarchies are related. While situationally relevant meanings may help a person to select an appropriate identity to enact, an identity's placement in one's hierarchy influences its placement within the others. In

general, identities higher in importance (prominence), salience, and commitment are more likely to be enacted across situations. We also know that identities that are more salient also become more important (McCall and Simmons 1966). Identities that have more commitment are also more salient (Stryker 1980; Stryker and Serpe 1994). Commitment to an identity increases the salience of that identity such that the presence of individuals tied to an identity will create an opportunity for that identity to be activated (Stryker 1980). The more individuals one knows because of an identity (commitment), the more likely one is to encounter an individual relevant to the identity, and the more likely it is to be activated. Similarly, individuals deprived of extrinsic rewards (tangible and non-tangible goods from others), intrinsic rewards (positive internal states such as emotion), and social support related to an identity are more likely activate that identity if it is important and salient to the individual (McCall and Simmons 1966). Thus we can see that activation of an identity is a function of its placement in prominence, salience, and commitment hierarchies; its level of support, and its relevance to meanings in the situation.

Once identities are activated in a situation, they operate as a control system as described above. As previously mentioned, when an identity is verified in the situation, people feel positive or neutral emotions, gain self-esteem if the identity is continually supported across situations, and continue acting in the situation as before. When an identity is not verified in a situation, individuals feel negative emotion, experience a decrease in self-esteem, and adjust behavior to change meanings in the situation to match the meanings in the identity standard. Interruptions to the identity control process can occur at different points in the system and can be influenced by properties of the identity. These interruptions are discussed below.

Interruptions to the Control System

When a discrepancy occurs, individuals experience negative emotion, a decrease in self-esteem, and enact some form of behavior to change perceptions in the situation toward matching

the identity standard (Burke and Stets 2009). Properties of the control system and of the identity can influence the likelihood of disturbance and the intensity of reaction to a disturbance respectively.

Properties of Identities

It was discussed above that identities vary in prominence, salience, and commitment. Identities that are more important to the self (prominent) are more central to one's self-view. If an individual stakes a lot of their self-esteem on one identity over another, a discrepancy to that identity can be more problematic to the self. It has been theorized that a discrepancy to an identity that is more important to the self will result in a more intense emotional reaction than an identity less important to the self (Burke 1991; McCall and Simmons 1966). Identities that are more prominent also tend to exhibit more commitment.

The more committed an individual is to an identity, the more tied that identity is to the social structure and others within their networks, and the more problematic it will be if that identity is not verified. Thus, a discrepancy to identities with more commitment will result in a more intense reaction than discrepancy to identities with less commitment (Stets 2006). Identities that are more likely to be enacted in situations (salient) often become more important to the self and exhibit more commitment. A discrepancy to a more salient identity is theorized to result in a more intense response than a discrepancy to a less salient identity (Stets 2006).

Significance of Others

Identity theory has also discussed the role of the significance of others in situations in relation to the identity verification process. We know that individuals that come into contact with each other regularly tend to create mutual verification situations in which each individual verifies the identity of the other and in so doing, obtains verification of his/her own identity (Burke and Stets 1999). This mutual verification context generates trust and commitment between the two

individuals and strengthens the bond between them. When an identity is not verified by an individual more important to us, we will feel a more intense reaction than if the identity is not verified by an individual less important to us.

Individuals in situations have differing significance to us. Different individuals will be important to the verification of a student identity than a daughter identity. While my mother may be important to me and while her opinion of me may matter, her opinions are more important and relevant for some situations over others. When enacting the daughter role, her opinion of my "daughterliness" will be more important than her opinion of my "studentness" when I am enacting the student identity. The significance of an individual and their subsequent feedback in the situation has different consequences for identity discrepancy. Identities disrupted by significant others will result in a more intense reaction than identities disrupted by non-significant others (Burke 1991).

Status

Intensity of emotional response has also been tied to the relative status of the actor providing feedback in the situation. A status characteristic is anything that shapes the evaluation of actors in a situation in relative value to each other. Examples of status characteristics include sex, age, or race (Berger, Rosenholtz and Zelditch Jr. 1980). In situations, actors determine the relative status of the self to others based on observable differences. If there are no observable differences in which to attribute status, individuals will depend upon situational cues that may reveal differences in ability or intelligence. Within IT, status has been explored through the influence of gender differences in situations on one's ability to verify an identity and the influence of non-verification by a high versus a low status actor on emotion (Cast, Stets and Burke 1999; Stets 2003; Stets and Harrod 2004; Stets and Osborn 2008).

Individuals being under-rewarded in a situation by a high status actor report feeling more intense negative emotion than those being under-rewarded by a low status actor. These studies asked individuals to find missing information for addresses and were told they must complete X number of addresses in the allotted time. They would be awarded 100 points for meeting the standard work. Once time was up, participants were given feedback by a manager. The manager was either male (high status) or female (low status). The outcome of the study found that both male and female workers reported more intense negative emotional reactions to under-reward (50 points) by a high status manager (male). This suggests that the status of the other relative to the self can influence one's reaction to discrepancy, namely that discrepant feedback from high status others affects the self more than feedback from low status others.

Research by Cast, Stets, and Burke (1999) also found similar results. In this study of newly married couples, it was found that high status actors (men) are more able to achieve verification of their identities while also controlling the feedback that the low status person provides. That is, men are more able to change their spouse's views of the self. Since women in this study are less likely to achieve verification due to their low status in their marital relationship, they were shown to experience identity change toward the appraisals of their husbands. This suggests that higher status actors are also able to manipulate the self-views of others over time and are able to exert more control over meanings in the situation. Other research has also found that high status actors (white, male, older, and more educated) are more able to achieve verification across multiple identities than low status actors (non-white, female, younger, and less educated) (Stets and Harrod 2004).

Prolonged Discrepancy

While previous theory suggests that prolonged discrepancy to an identity results in a more intense emotional reaction (Burke 1991), research has found that individuals actually feel

less negative emotion over time and conclude that individuals are most likely adjusting their standards as prolonged non-verification occurs (Stets 2003; Stets 2005). These studies were conducted in an experimental setting in which individuals were given feedback on how well they performed a task. The standard for adequate work was explained prior to the task and while individuals performed what would have been deemed adequate, they were given feedback that they either exceeded or did not meet the standard. After their emotional response was recorded, they were given another task and provided with feedback after finishing the task. These studies provide participants with three successive instances of non-verifying feedback and show that the intensity of emotion in reaction to non-verifying feedback over time decreases. This decrease in negative emotion suggests that the identity standard meanings were being adjusted so that the discrepancy was not as detrimental.

Present Study

The above section discussed various aspects of a situation that can affect how individuals experience and adjust to a discrepancy. There is another aspect of the control system that is often overlooked when discussing identity maintenance. While a control system acts to maintain a perception equal to the standard, control systems can vary in how tightly or loosely they maintain perceptions being close to that standard. Loop gain is a measure of the tightness of a control system (Powers 1973).

The ideas behind tightness of control of a system are not new. Until now, they have not been tested nor incorporated thoroughly within identity theory. This dissertation seeks to incorporate the notion of tightness of control into the identity process and tests how it affects the outcome of discrepancies for people with varying levels of control of an identity. What follows is an explanation of the concepts related to tightness of control of an identity and how it can be incorporated into identity theory.

Tightness of Control / Sensitivity to Feedback

In describing the tightness of the control system, I first turn to the way this concept is described in previous cybernetics theory. In cybernetics, the concept of tightness of control is described by loop gain, or the ratio of intensity of reaction to magnitude of the disturbance (Powers 1973; Weiner 1948). The larger this ratio, the more tightly controlled the system. The loop gain for a tightly controlled system will show a more intense reaction for a given intensity of disturbance than a loosely controlled system. In this way, loop gain and tightness of a system are inversely related.

Loop gain can only be measured when the value of the disturbance is known. In order to measure loop gain, the control system must be altered and a fixed value of disturbance is introduced into the system. If measuring the loop gain of a thermostat, a constant room temperature would be introduced to the system, for example 80 degrees. The comparator will compare the fixed disturbance value (80 degrees) to the standard (75 degrees). The error will result in adjustment of output (air conditioning) that is measured. The ratio of the disturbance to the output is the measure of how tightly controlled the system is. In this case, we may compare the disturbance of 5 degrees to the length of time it took the system to correct the disturbance. We may also measure how cool the air is being pumped into the room. The more intense the output, the more tightly controlled the system. Tightness of control can also be understood as a system's sensitivity to feedback in that tighter control systems are more sensitive.[8]

Since mechanical systems can be programmed, their sensitivity to feedback is constant. An objective measure of loop gain or tightness of a system is possible in this case because disturbances and reactions can be measured objectively. Determining the tightness of a control

[8] Tightness and sensitivity will be used interchangeably.

system for an identity in individuals may be more difficult. Individuals use many different behaviors to correct disturbances to their perceptions in situations (Burke and Stets 2009). The type of feedback (disturbance) individuals receive can be controlled in an experimental setting but measuring the intensity of the strategy used to correct the disturbance would be difficult.[9]

We may conceptualize tightness of the control system as a system's sensitivity to error (Powers 1973).[10] A tight system will register a discrepancy more quickly than a loose system (Carver and Scheier 1998; Powers 1973). A sensitive system will respond to error in a more precise and effective manner than a less sensitive system. For example, a thermostat is comprised of a mechanism measuring the temperature of the space it is regulating (input), a mechanism to set the reference temperature (reference signal), a mechanism (comparator) that determines the difference (error signal) between the setting and the current temperature, and a mechanism to turn on the heat or air conditioner to change the temperature of the space (output). A sensitive thermostat will act to change the temperature of the space more quickly and will regulate temperature more finely than a less sensitive system. Perhaps the sensitive system turns on the air conditioner if the temperature of the space deviates by 1 degree and a less sensitive system turns on the air conditioner if the temperature deviates by 2 degrees. The less sensitive system will take longer to register and correct the disturbance than a more sensitive system.

Tightness of Control and Identity Theory

Past theory has suggested that identities can vary in tightness of control (Burke 1991; Carver and Scheier 1998). Within identity theory, this means that an identity that is more tightly

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[9] Individuals can use a wide range of overt behaviors to correct any given situation. Individuals can also change their perceptions of the situation. This internal process may be more difficult to measure.

[10] This is not meant to imply that control of the system is always consciously maintained. The tightness of control of a system determines its sensitivity to disturbance. A tightly controlled system will have greater sensitivity which will lead a person to be more easily or quickly alerted to a discrepancy that requires attention. Once the matter is seen as a problem by the self, conscious control is required.

controlled is more sensitive to discrepancies. When a discrepancy occurs in a tightly controlled system, the individual experiences more distress for a given level of discrepancy (error) than an individual with a looser control system (Burke 1991). A system that is more sensitive to the discrepancy reacts more intensely (higher loop gain) because it notices smaller discrepancies than a less sensitive system.

Since the goal in the identity control process is to achieve and maintain verification of one's identity or identities activated in the situation, the comparator must continuously monitor the difference between feedback in the situation and one's identity standard meanings. When the comparator registers a discrepancy, the control system reacts to correct it. Systems can vary in their sensitivity to discrepancies and this sensitivity will influence how the system reacts to correct it.

In determining the tightness of control of an identity, we turn to meanings. As discussed above, meanings are an underlying concept of the control model of IT. An identity standard is comprised of a set of meanings that describe the self as a unique individual, as an occupant of a role, or as a member of a group. Individuals interpret feedback from the self and others in the situation along meaning dimensions relevant for the activated identity (Burke and Stets 2009). Just as individuals can possess various identities, the same identity can carry various meanings for different individuals.

Previous research has looked at varying meanings of identities through a distributive image (Burke 1980). A distributed image is a "working copy" of one's identity that fluctuates in the situation. While one's identity standard meanings are relatively stable over time and across situations, one's distributed image is a gradient of meaning centered around the identity standard. This gradient of meaning is a set of situational self-meanings that fluctuate around the identity standard based on properties of the situation.

As discussed above, one's identity standard can be represented by a point in N-dimensional meaning space. Dimensions of meaning for an identity are measured by having individuals evaluate their self-view along specific meaning scales. For example, the student identity contains such meanings as hardworking, studious, competitive, and open-minded (Reitzes and Burke 1980). Answers to these meanings are clustered along dimensions. The identity standard for an individual is represented as a single point situated along each dimension. Each dimension is represented as an axis on a graph. A graph of the student identity would have four axes, one for intellectually curious, another for academic responsibility, another for sociability, and a fourth for personal assertiveness. An individual's student identity standard would be a point situated on all four axes simultaneously just as a point on the Cartesian scale represents two values on two axes simultaneously (X,Y).

For example, one's student identity standard would be represented by a point showing the degree one views the self as intellectually curious, sociable, personally assertive, and academically responsible. Around this point would be a probability distribution representing one's distributed image for the student identity. This probability distribution would extend in all directions along each axis. The distribution is comprised of all the ways an individual thinks of himself as a student along those dimensions. A student may believe himself to be somewhat intellectually curious but may also think of himself as very intellectually curious or a little intellectually curious at other times. This individual may therefore be accepting of those meanings for his student identity and may enact behaviors that are aligned with those meanings. While the top of his student identity distribution, the identity standard, would represent a self-view as somewhat intellectually curious, his identity distribution of meanings would also encompass very intellectually curious and a little intellectually curious to a lesser degree. Having a distribution of meaning around one's identity standard allows a person some flexibility in how

they act out a role in a situation. Meanings closer to the identity standard have a higher probability of being evoked within a situation while meanings farther from the identity standard meanings approach a probability of zero (Burke 1980).

The width of the distribution represents the variety of meanings a person associates with the self along each dimension. Individuals can have distributions for the meanings that contribute to each dimension for an identity. For example, individuals can vary in how they evaluate the self along the meaning of studious for the dimension academic responsibility. The meaning, studious can vary conceptually from not at all studious to extremely studious. For ease of discussion, let us attribute numbers to this scale. If 0 represents not at all studious and 10 represents extremely studious, suppose an individual has an identity standard of 4 along that dimension (see Figure 2.2 below). Since the distribution of meaning around that point can vary in width, this individual can have a narrow distribution comprised of few other meanings around that point, from 2 to 5, for example (Person A). Alternatively, another individual can have a wide distribution comprised of many meanings along that continuum, from 2 to 8, for example (Person B). The width of the distribution outlines the meanings a person is more comfortable with in situations.[11] The dispersion of meanings within one's identity distribution is inversely related to the concept of loop gain. Here, a larger amount of dispersion (a wider distribution) represents a looser control system, whereas a smaller amount of dispersion (a narrower distribution) represents a tighter control system.

[11] Measurement of these concepts are discussed in Chapter 3.

Figure 2.2 Identity Distributions for Two Actors

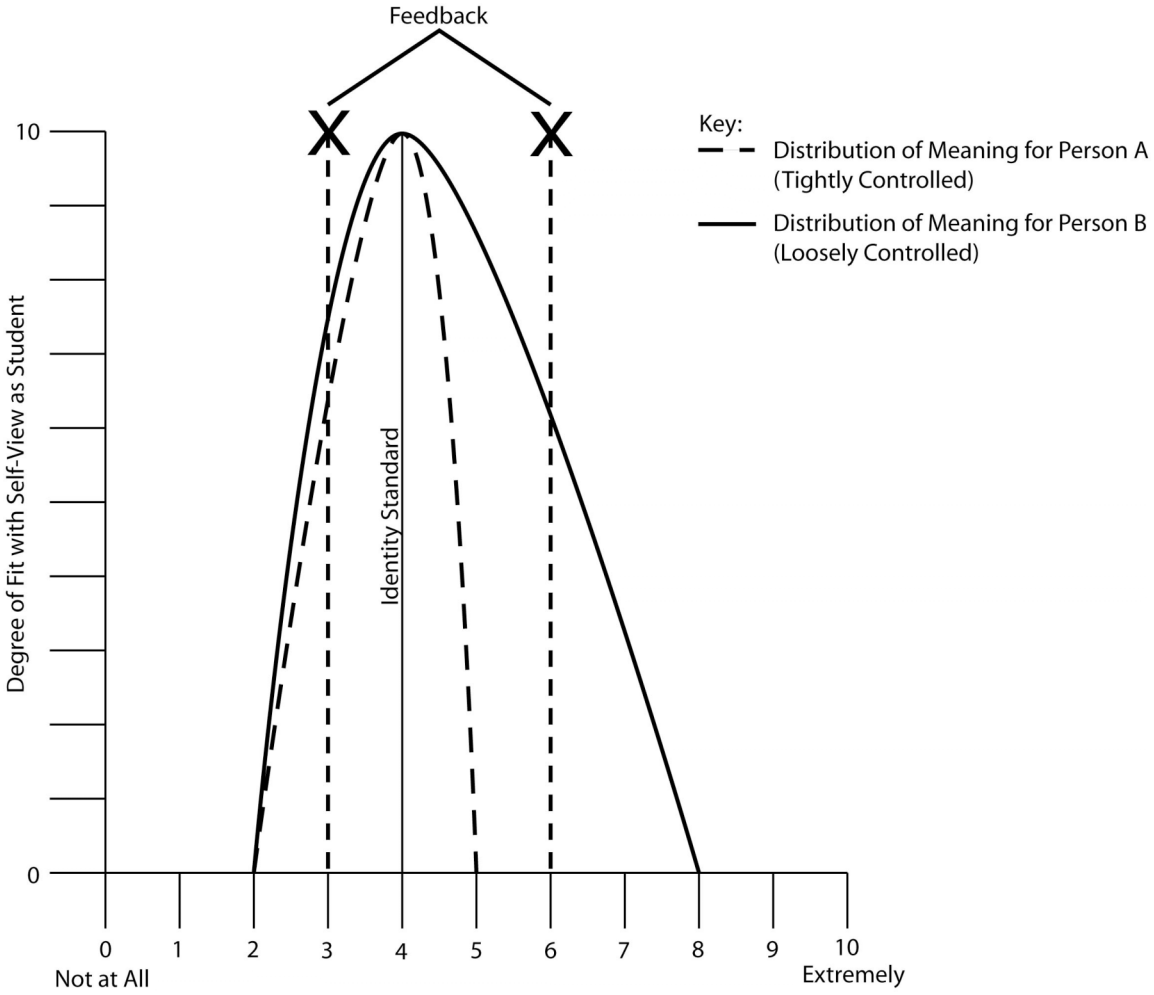

Figure 2.2 shows hypothetical distributions of identity meanings for two such individuals along the identity meaning studious. These distributions are as described above. Person A, the dotted line, has a distribution of meaning that ranges from 2 to 5 (a little studious to quite studious) while Person B, the solid line, has a distribution of meaning that ranges from 2 to 8 (a little studious to very studious).[12] Person A has a narrower distribution of meaning indicating a more tightly controlled identity compared to Person B. Both individuals have the same identity

[12] The numbers used here are arbitrary. Measurement of distributions of meaning for identities is discussed in Chapter 3.

standard of 4 (somewhat studious) indicated by the mode of the distribution. If both individuals receive feedback that they are a 3, the discrepancy is -1 (4 - 3= -1) and person A will notice the discrepancy more quickly than person B. While the discrepancy is of the same magnitude (-1) for both individuals, person A's distribution is more narrow and thus more tightly controlled than person B. While there are minor differences in the shape of their distributions for the under-evaluation side, the line for person A's distribution is slightly narrower than person B's in this case, indicating person A's reaction will likely be more intense than person B's even if it is only slightly more intense. Similarly, if both individuals receive feedback that they are a 6, the discrepancy for both individuals is now +2. Based on the distribution above, Person B will experience less negative emotion and enact a weaker behavioral response to this over-evaluation because he sees a 6 for studious as a probable set of meanings associated with his self-view as a student.

Obtaining feedback that fits within one's distribution of meaning will be less distressing than obtaining feedback that falls outside of one's distribution of meaning. The narrower one's distribution of meaning and thus the more tightly controlled the identity, the fewer meanings associated with one's identity and the more sensitive it is to discrepancy. Though all feedback not aligned with one's identity standard will cause some form of distress and will motivate a person to get rid of the discrepancy, feedback within one's distribution of meaning will cause less distress because the probability of an individual accepting those meanings is greater than zero while feedback that falls outside one's meaning distribution has a probability of zero of being accepted or enacted.

We assume that a distribution of identity meaning is unimodal with the set of identity standard meanings located at the mode (top of the distribution). This distribution can be skewed or not but cannot be multi-modal because identity theory assumes people have a stable set of self-

meanings that describe aspects of the self (identity standard) (Burke and Stets 2009). People with more dispersion of meanings around their identity standard (a wider distribution) are more flexible in accepting various types of feedback from others. Individuals with wider distributions will be less sensitive to feedback because their distribution of meaning contains a larger meaning structure. The opposite is true as well. People with less dispersion of meanings will be less flexible, more sensitive to feedback from others, and more susceptible to negative output resulting from a discrepancy. One's sensitivity to feedback, as measured by dispersion, should moderate the negative effects typically found when a person experiences a discrepancy. That is, the tightness of one's control system should affect how output (emotion and behavior) is experienced when a discrepancy occurs. Individuals with tighter control systems (narrow distribution of meaning) should feel more negative emotion when a discrepancy occurs and should enact a stronger behavioral response to correct the discrepancy than individuals with looser control systems (wide distribution of meaning).

For example, the gender identity can range from extremely masculine to extremely feminine (Burke and Tully 1977). One individual may have a narrow distribution (tight control system) at the masculine end of the scale while another individual may have a narrow distribution of meaning at the feminine end of the scale. Each of these individuals would likely exhibit very masculine or very feminine characteristics in situations so as to verify their respective gender identities. We can also conceive of an individual that may have a very wide distribution (loose control system) of gender identity meanings along the center of the scale helping to characterize that person as have a more androgynous gender identity. This person can exhibit both masculine and feminine characteristics to verify their gender identity. While individuals can have different distributions of identity meanings, that distribution will influence how they experience

discrepancy such that individuals with narrow identities will experience a more intense emotional and behavioral reaction than individuals with wider or more loosely controlled identities.

By conceptualizing a distribution of identity meanings, we are able to examine differences in outcomes for individuals with differently controlled identities experiencing discrepancies of the same magnitude. If this is conceptualized numerically and both individuals have an identity standard of 4 and receive feedback that they are a 2, both individuals have a discrepancy of -2 (under-evaluation) even though their distributions differ. If two people have different dispersion patterns of identity meaning, such that person A has less dispersion around her identity meanings (tight control) than person B (loose control), a discrepancy for person B should result in less intense emotional and behavioral reactions because person B's meaning distribution contains more acceptable identity-relevant self-meanings than person A. In the same way, a looser control system will be less effective at both registering a response and at engaging in reparative action (Powers 1973). In this case, we may say that a person with a looser control system (more dispersion around their identity standard) will feel less negative emotion than a person with a tighter control system (less dispersion of meanings) though both will feel some degree of negative emotion as a result of the discrepancy.

Behavior is another outcome of a discrepancy. Individuals will enact behavior to counteract the disturbance such that an individual receiving feedback that he is more intellectually curious than his identity standard will enact behavior to change the perceptions of others to bring them toward his standard. For example, if a student believes he is not at all intellectually curious but is told by a professor that he seems like he would be a good candidate to continue on to graduate school after college (very intellectually curious), the student may tell the professor that he merely wishes to work at a coffee shop upon graduating to express that he is not at all intellectually curious.

The tightness of one's control system determines how quickly the system recognizes a disturbance and how effective it is at correcting the disturbance. A less effective system, one that has more dispersion in identity meanings, should be less able to recognize the intensity of behavior that should be enacted. If the student above has a tightly controlled system, the comment from the professor will be accounted for almost instantly. The student's response about aspiring to be a barista will come about relatively quickly as well. If the student has a very loose system, the individual may ponder the comment about attending graduate school for a few seconds before responding with a relatively neutral or indifferent response. The sensitivity of a person to discrepancy will moderate the outcome to a discrepancy such that a tighter system will result in a more intense emotional response and a quicker, more effective behavioral response.

Tightness of Control and Properties of Identities

Self meanings associated with identities are both a function of one's experiences in life and the feedback obtained from others. We become accustomed to managing these meanings through trial and error as we interact with others and learn of expectations for behavior. Some of our identities are more important to the self, some we are more committed to, and identities vary in relevance to situations. Prominence, commitment, and salience influence whether an identity is activated in any given situation. These factors may also influence the tightness of control of an identity.

We have established that discrepancies to prominent, salient, and committed identities should result in more intense emotional response when a discrepancy occurs (Burke and Stets 2009). Identities higher in these hierarchies are more central to the self, are more likely to be enacted in situations, and are tied to many and important others. Given that we expect more sensitive identity control systems to have a more intense reaction to discrepancy, and that discrepancies to more prominent, salient, and committed identities also result in more intense

reactions, it is likely that prominent, salient, and committed identities also operate under more tightly controlled systems. That is, identities that are higher in each hierarchy should also be more tightly controlled than identities lower in the prominence, salience, and commitment hierarchies.

Prominent identities are those that are more important and central to one's self-view (Burke and Stets 2009; McCall and Simmons 1966). If more of one's self-view is staked in an identity, it will be more important for that individual to obtain verification for that identity. Establishing verification would require the individual to enact behaviors that share the same meanings as the identity (Burke and Reitzes 1981; Reitzes 1980). When this important identity is not verified, the individual will feel worse because the identity is more important to the self. The control system will manage the behavior in the situation in order to bring situation meanings and self-relevant identity meanings into alignment. Because the identity is more important, it may be controlled by a tighter control system.

Salient identities are those that are more likely to be enacted across situations (Burke and Stets 2009; Stryker 1980). If an identity is enacted constantly, the meanings will likely become more defined and stable. The dispersion of meaning around that standard may also be narrower because meanings farther from the identity standard are rarely enacted in situations. As a result, more salient identities may operate under tighter control systems. An identity that is less frequently enacted may not have an established set of meanings that must be upheld.

Committed identities are characterized by the number of ties an individual has to others because s/he possesses an identity and the depth of those ties (Burke and Stets 2009; Stryker 1980). Identities with a lot of commitment are tied to many others and/or are tied to individuals whom one is close to or has a deep relationship with. Identities with more ties will likely be characterized by a tight control system because the individual must maintain a consistent image across all of those relationships. S/he will have less flexibility in how s/he acts with each of those

others because s/he will have to maintain a common sense of self when interaction with many of those others both individually and simultaneously.

If identities possessing more prominence, salience, and commitment are more tightly controlled, it is likely that an identity high in all three hierarchies will be even more tightly controlled than an identity that possesses high prominence but low salience and commitment. If an individual really wants to be seen as a controlling person but rarely enacts that identity and few people know that individual as being controlling, the control system will be looser than an individual that wants to be seen as controlling and enacts that identity frequently around others by requiring individuals to meet their own demands or directing what others should do. The following predictions focus on the outcomes of discrepancy rather than the contributing factors to tightness of control of an identity.

Predictions

The purpose of this study is to understand how dispersion in identity meanings affects the verification process. We must first establish that previous findings in the identity theory framework hold with this data (Hypothesis 1 and 2) and discuss why each prediction is made. Next, I provide hypotheses (3 and 4) about the role of dispersion of identity meanings in the verification process and why these predictions are made.

Previous research and theory within the identity theory framework has established the link between identity verification and emotion. When identity meanings are not supported by others in a situation, individuals experience a discrepancy that leads to heightened negative

emotion regardless of the direction of the discrepancy.[13] For this reason, identity discrepancies are typically measured and then squared to indicate size of discrepancy rather than indicating over- or under-evaluation.[14] The intensity of negative emotion felt will increase with the size of the squared discrepancy (Burke 1991; Burke and Stets 2009). Therefore I hypothesize:

H_1: The intensity of negative emotions in response to a discrepancy will be a positive function of the square of the discrepancy between appraisals and the identity standard.

Behavior is an outcome of identity meaning maintenance. In order for individuals to experience identity verification, they must enact behaviors aligned with the meanings held in the identity standard(s) of the identity(ies) being controlled in the situation. Previous studies have established identity-behavior congruence (Burke and Reitzes 1981; Reitzes 1981). That is, individuals tend to enact behaviors that are congruent with their identity meanings. Theory posits that in the case of discrepancy, one's behaviors may change as one strategy for changing the perceptions in the situation in order to correct the discrepancy and achieve verification for that identity. Behavior will be enacted to correct the discrepancy toward the direction of the standard to counteract the disturbance.

For example, if an individual interpreted feedback from a professor that s/he is an excellent student, but has the self-view of being a moderate student, the individual will likely engage in behaviors to obtain feedback aligned with this self-view. Perhaps the student will skip a few classes or turn in poorer quality work. This would be akin to the students that want to do just

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[13] Some studies suggest that a discrepancy in a positive direction or in a socially desired direction will result in less negative or even positive emotional output (Stets 2003, Stets and Asencio 2008, Stets and Osborn 2008). The consensus within identity theory is that while emotional reaction may be initially positive to a discrepancy in a socially desirable direction, one's emotional output tends toward negative emotion as time between the discrepancy increases (Burke and Stets 2009). Thus, I expect negative emotion to result from a discrepancy in any direction.

[14] Measurement of discrepancy in identity theory uses a squared discrepancy instead of absolute value because squared discrepancy measures have resulted in more significant results in the past indicating the relationship between discrepancy and emotion is curvilinear (Burke and Stets 2009).

enough to pass a class. Similarly, if a student receives feedback that they are worse than their self-view, s/he should engage in more student like behaviors to increase feedback. Thus, behavior will be enacted in such a way to change feedback and bring one's perceptions into alignment with one's identity standard. In this sense, larger discrepancy should result in greater magnitude of behavior in the opposite direction of the discrepancy. Thus, a negative coefficient should result. Therefore, I hypothesize:

$H_{2:}$: The frequency of study behaviors in response to discrepancy will be an inverse function of the amount of discrepancy between appraisals and the identity standard.

The tightness of control of an identity reveals the control system's sensitivity to discrepancy. The sensitivity of a system should moderate the effect of discrepancy on behavior rather than have a direct effect. A direct effect would imply that an individual with a more sensitive system will feel positive or negative emotion as a result of possessing a sensitive system. This dissertation focuses on how the sensitivity of a system interacts with the disturbance to emotion relationship. In this case, a more sensitive system should result in feelings of more intense negative emotion in the face of discrepancy. Again a squared discrepancy measure is used here because any discrepancy, regardless of direction, is theorized to result in negative emotion. Tests of the following hypothesis include an interaction term of discrepancy multiplied by identity dispersion to measure the way dispersion moderates the effect of discrepancy on emotion. Therefore I hypothesize:

H_3: The strength of the link between the intensity of negative emotion and the squared discrepancy between appraisals and the identity standard will vary inversely with the dispersion of the identity.

Behavior is enacted to counteract a discrepancy in the control system. As discussed above, systems that are more sensitive to error are more effective at correcting a discrepancy.

This study examines change in study behavior as a reaction to an exam grade. Individuals report the number of study behaviors they enacted in studying for an exam and after receiving the grade for that exam, report the number of study behaviors they anticipate enacting for the next exam. The change in number of behaviors and direction, whether positive (enacting more study behaviors) or negative (enacting fewer study behaviors), should counteract the discrepancy. Getting a higher grade than one expected should result in fewer study behaviors while getting a lower grade should result in more study behaviors.

The sensitivity of the control system to a disturbance should moderate this effect. An interaction term of discrepancy multiplied by identity dispersion is used to measure this moderating effect. A more sensitive control system will be less effective in counteracting the discrepancy when adjusting behavior. A more loosely controlled system will change behavior to counteract the discrepancy, but less so than a tightly controlled system. Therefore, I hypothesize:

H_4: The strength of the inverse link between frequency of study behaviors and discrepancy between appraisals and the identity standard will vary inversely with the dispersion of the identity.

The above hypotheses are tested using a group of undergraduate students. These students were asked to report feelings, behaviors, and self-meanings associated with the student identity dimension academic responsibility. The data collection methodology, operationalization of the above concepts, and analysis techniques used to test the above hypotheses will now be discussed.

CHAPTER 3

METHOD

Instrument

The data used for this study were obtained from a three-part web-based survey administered to student volunteers in a large, lower-division geology course during the Fall quarter of the 2010 school year. The topics covered in the surveys included participants' student identity meanings along the dimension academic responsibility, dispersion in student identity meanings, expected and actual grades on a mid-term exam, emotions related to the grade on that exam, reflected appraisals in relation to the student identity meanings, and actual and projected study habits for the course exams. Background characteristics were also collected, including age, sex, ethnicity, and parent income. Sex, ethnicity, and parent income are controlled in analyses to account for potential influence of each on emotion and behaviors. Participants received extra credit for their participation in this three-part survey.[15] Examples of all measures used are enclosed in Appendix A.

Sample and Design

The course used for this study had a total of 537 students enrolled. There was attrition in participation as the survey study commenced. A total of 401 individuals participated in the first survey. Of the 353 participants that completed the second survey, one did not complete the first survey. Of the 347 participants that completed the third survey, 10 skipped at least one of the previous surveys. There were a total of 455 individuals that participated in any portion of the

[15] An alternative activity was available if students did not wish to participate in the study but wanted to earn extra credit. No students participated in the alternative.

study and 338 that completed all three surveys over the first five weeks of the Fall quarter.[16] Cases were dropped if they contained missing data on any of the variables of interest used in the analysis or for not following directions. The remaining sample for this study is 288 individuals, 85% of the 338 that participated in all three surveys. The population demographics of the university are diverse with a campus comprised of 52% women and 48% men with an average age of 21 years. The racial/ethnic background of university students is as follows: 40% Asian, 28% Hispanic, 17% White, 8% Black, and 7% other.

More women (72%) than men (28%) participated in the study. The average age of participants is 19.2 years, slightly lower than that of the university as a whole. This age difference is likely due to the course being a lower division course and therefore attracting more first and second year students. The racial diversity of the sample reflects that of the campus and includes 30% Asian, 32% Hispanic, 20% White, 5% Black, and 13% represented by other ethnicities. This sample slightly underrepresents Asian and Black students and overrepresents Hispanic, White, and students of other ethnic backgrounds. As with the university, Asian and Hispanic students are a majority in this sample.[17]

Measures

Dependent Variables

Negative Emotion. Participants were asked to rate the intensity to which they felt the following emotions in response to the grade on their exam: anger, sadness, fear, happiness, shame, anxiety,

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[16] In some cases, students completed a survey multiple times if they were not sure they completed the survey already. The first attempt was kept when multiple survey attempts were complete. In cases where a student provided incomplete data on one survey attempt but participated in the full survey on another attempt, the full survey data was kept.

[17] Demographic characteristics of the individuals dropped from the analysis are similar to those included in the final analysis. Of the 167 individuals dropped, 111 reported sex and ethnicity and 113 reported their age. There were 72% females and 28% males in the dropped cases, the mean age of these individuals was 19.2 years and their ethnicity is as follows: 28% Asian, 41% Hispanic, 14% White, 5% African American, and 13% other.

joy, satisfaction, displeasure, and discomfort. These emotions were chosen to represent both primary and secondary emotions that may result from a discrepancy. Fear, anger, sadness and happiness are the four primary emotions most agreed upon by scholars (Turner and Stets 2005) and have been used to test feelings of negative emotion in the past (Burke and Stets 2009). Additional emotions were included to cover the gamut of potential emotions felt by individuals as a result of discrepancy.

Principal component factor analysis was conducted on the emotions to establish unidimensionality. A negative emotion scale was created by aligning the scales so that high scores represent high negative emotion or low positive emotion, standardizing each emotion and summing across the measures. This scale has an omega reliability of .98 and was standardized to have a mean of 0 and a standard deviation of 1. A higher score reflects feeling more negative emotion. Factor loadings for each of the emotions is reported in Table 3.1.

Table 3.1 Principal Component Factor Loadings for Negative Emotion	N=288
Anger	.80
Sadness	.89
Fear	.84
Happiness	-.78
Shame	.83
Anxiety	.76
Joy	-.74
Satisfaction	-.74
Displeasure	.86
Discomfort	.80
Eigenvalue	6.47
Ω	.97

Change in Study Behavior. Participants were asked to report whether they performed any of the following study behaviors in preparing for their mid-term exam in survey 2: attended TA's office hours, attended professor's office hours, reviewed the study guide, reviewed their notes, reviewed lecture slides, or studied with others. Each item a student selected was coded with a 1, and non-

selected behaviors were coded 0. These scores were summed to create a measure describing the number of study behaviors enacted for the mid-term exam. In survey 3, participants were asked which of these same behaviors they would enact to study for the next exam. Again, each selected item was coded 1 and each item not selected was coded 0. These scores were summed to create a count of anticipated study behaviors.[18] A change in behavior score was created by subtracting mid-term study behaviors from anticipated study behaviors. A negative score indicates anticipating participation in fewer study behaviors for the next exam than in the mid-term exam whereas a positive score indicates anticipating studying more for the next exam than the mid-term exam.

Independent Variables

Identity Dispersion. To measure the dispersion in identity meanings for the student identity dimension academic responsibility, participants were asked to fill out a series of distribution questions. Each of the six questions focused on one of the following meanings associated with the academic responsibility: studious, hardworking, dedicated, motivated, responsible, and ambitious (see Figure 3.1). These items were chosen from the list of semantic differential scales used in previous student identity research (Reitzes and Burke 1980). The original student identity scale includes 24 items related to four different dimensions of the student identity: academic responsibility, intellectualism, personal assertiveness, and sociability. Since this new measure for distributed identity meanings (described below) may be taxing for 24 items, I chose a subset of six relevant meanings for the student identity based on the discriminant analysis loadings found in previous research (Reitzes and Burke 1980). Items chosen loaded highly on one or more of the student identity dimensions (academic responsibility, intellectualism, personal assertiveness, and

[18] Since the next mid-term exam in the course was scheduled for the following week, it is likely students were actively thinking about how they would prepare and/or change their study habits to do well on that exam.

sociability). Studious loaded highly for academic responsibility and intellectual curiosity. Hardworking and dedicated are related most to academic responsibility. Motivated loads highly for academic responsibility and personal assertiveness. Responsible loads highly on academic responsibility and sociability. Lastly, ambitious is closely related to personal assertiveness (Reitzes and Burke 1980). These meanings are found to load along one dimension that is most closely related to academic responsibility (see Table 3.2).

Figure 3.1. Measure of Identity Meaning Distribution

Think about yourself as a college student.
How Studious Are You?

Pick the column that best describes you and click on "10"
Next pick any columns that do not at all describe you and click on "0"
For the remaining columns, click on the number
that represents your reaction (at the left) to the descriptions at the top.

		Extremely Studious	Very Studious	Quite Studious	Somewhat Studious	A Little Studious	Not Very Studious	Not At all Studious
10	Perfectly Describes Me	10 ○	10 ○	10 ○	10 ○	10 ○	10 ○	10 ○
9		9 ○	9 ○	9 ○	9 ○	9 ○	9 ○	9 ○
8	Describes me very well	8 ○	8 ○	8 ○	8 ○	8 ○	8 ○	8 ○
7		7 ○	7 ○	7 ○	7 ○	7 ○	7 ○	7 ○
6	Pretty close description of me	6 ○	6 ○	6 ○	6 ○	6 ○	6 ○	6 ○
5		5 ○	5 ○	5 ○	5 ○	5 ○	5 ○	5 ○
4	An OK description of me	4 ○	4 ○	4 ○	4 ○	4 ○	4 ○	4 ○
3		3 ○	3 ○	3 ○	3 ○	3 ○	3 ○	3 ○
2	A poor description of me	2 ○	2 ○	2 ○	2 ○	2 ○	2 ○	2 ○
1		1 ○	1 ○	1 ○	1 ○	1 ○	1 ○	1 ○
0	Does not describe me at all	0 ○	0 ○	0 ○	0 ○	0 ○	0 ○	0 ○

Before Clicking the Submit button,
be sure you have one column at 10,
one or more columns at zero, and the rest of the columns in between 0 and 10

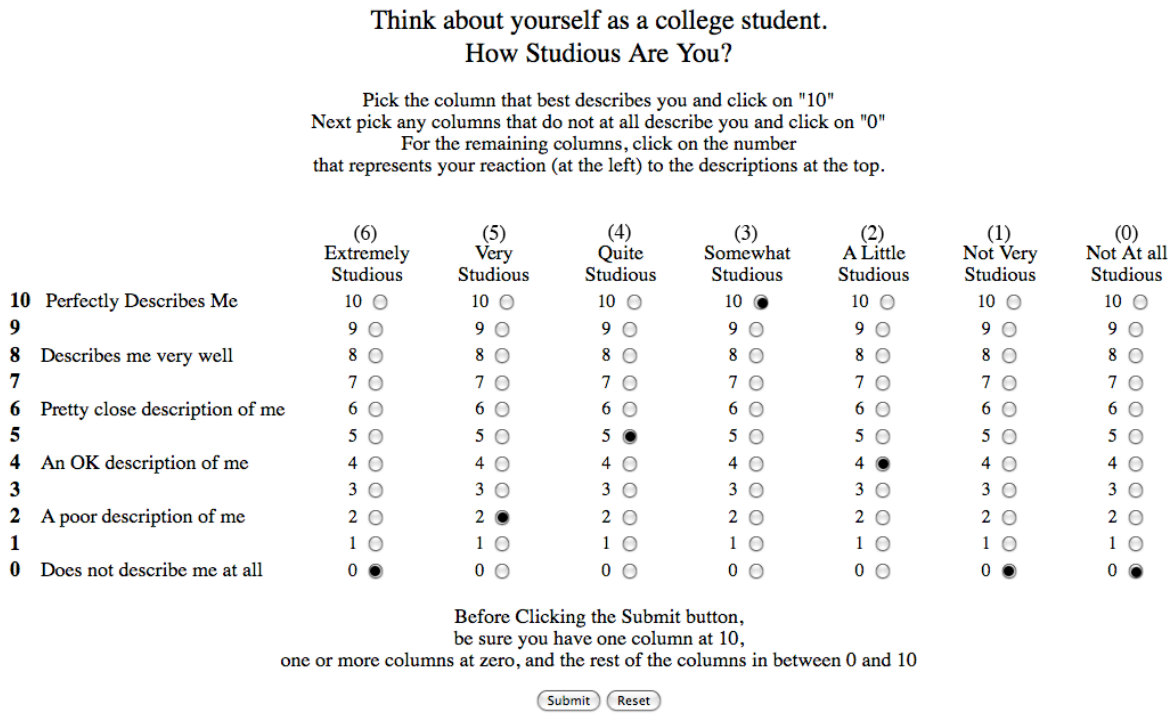
Submit Reset

Participants were presented with a matrix such as that shown in Figure 3.1. Each column is labeled along the continuum from Extremely X (6) to Not at All X (0). “Studiousness” is being tested in the example displayed in Figure 3.1. Each row was labeled with a description from Perfectly describes me (10) to Does not describe me at all (0). Participants are instructed to think about themselves as a college student and to select the column along the scale from “Extremely studious” to “Not at all studious” that best describes his or her self-view as a studious student by selecting 10 (Perfectly describes me) for that position. Next, individuals are instructed to place a

0 on any column that does not describe their self-view at all (Does not describe me at all). Lastly, participants are instructed to read the descriptions of fit along the left of the matrix and evaluate the fit of the remaining positions among the columns for their self-view as a college student.

For example, a student viewing the self as Somewhat Studious would select 10 in that column because this position describes her the best. Let us suppose this student feels that Extremely Studious, Not Very Studious, and Not At All Studious do not describe her at all. She would place a zero on each of those columns. The remaining columns describe her to some degree. If she believes Quite Studious is a pretty good description of herself, she would select 5 in that column. If she believes Very Studious is a poor description of herself, she would select 2 for that column. If she believes A Little Studious is an OK description of herself, she would select 4 for that column. An illustration of this is displayed in Figure 3.2, below.

Figure 3.2. Example of Hypothetical Student's Responses



To measure the dispersion across each dimension, I calculate the variance across the item scores (columns) weighted by the degree rating of each score (rows). This is done for each of the six items (studious, hardworking, dedicated, motivated, responsible, and ambitious). The variance of the six items are averaged to generate the variance across the dimension of academic responsibility. This is indicated in the following formula where X_i represents the item score (0 to 6) and ω_i indicates the rating weight (0 to 10).

[1] Variance for each dimension

$$\sigma^2 = \frac{\sum(X_i^2 * \omega_i) - \frac{\sum(X_i^2 * \omega_i)^2}{\sum \omega_i}}{\sum \omega_i}$$

Where:

X_i= numeric value of column position from Not at All X (0) to Extremely X (6)

ω_i= numeric value of row position from 0 to 10

For example, the variance for studious in Figure 3.2 would be 9.39:

[2] Example of variance for a single dimension.

$$\sigma^2_{studious} = \frac{((5^2 * 2) + (4^2 * 5) + (3^2 * 10) + (2^2 * 4)) - \frac{(5*2)^2 + (4*5)^2 + (3*10)^2 + (2*4)^2}{(5+4+3+2)}}{(5+4+3+2)} = 9.39$$

After the dimension variance was calculated for all respondents, the variable was standardized to have a mean of 0 and a standard deviation of 1. A higher number describes more dispersion in academic responsibility meanings for an individual.

Discrepancy Measures. An identity discrepancy is the difference between feedback from the self or others in the situation (appraisals) and one's identity standard meanings represented as the equation: Discrepancy = RA-IS. Thus if the reflected appraisal (RA) were 2 points higher than

the identity standard (IS), the discrepancy would be +2. This study uses a discrepancy measure in two ways, a squared discrepancy for emotion equations and a regular discrepancy for behavior equations. In order to calculate a discrepancy, we must first describe how one's identity standard meanings and appraisals are gathered.

The identity standard for academic responsibility is generated from the responses used to measure dispersion. The numeric value for the column marked with a 10 on each of the six dispersion scales is one's academic responsibility standard at time one (T1).[19] For example, if a person rated "Somewhat Studious" as the position that "Perfectly describes me" (10), a 3 would become their studious standard because the numeric value for the column "Somewhat Studious" is 3 along the scale from Not at All Studious (0) to Extremely Studious (6) (refer to Figure 3.2). This was done for each of the six items. The mean of the responses represents the identity standard measure.

Self and reflected appraisal measures from parents and friends were gathered from the third survey after students received their mid-term exam score. Participants were asked to report the grade they received on the mid-term exam. They were then asked "If your student friends found out about this grade, how do you think your college student friends would evaluate you as a student?" Participants were presented with a matrix displaying each of the six academic responsibility items (studious, hardworking, dedicated, motivated, responsible, and ambitious) and rated them from Extremely X (6) to Not at All X (0) for each of the six items, as previous research has done. They were then asked "If your parents found out about this grade, how do you

[19] The numeric value for the column marked with a 10 is used because it is most similar to the way identity standards are measured. In previous research, identity standards are measured by presenting participants with a semantic differential scale with two opposing adjectives anchoring each end of the scale. Individuals are then asked to select the position along the scale that best represents how they see themselves. In this study participants are asked to select the position that best represents how they see themselves from Not at all X to Extremely X in the identity variance measure for each of the six items. The numeric value of that selection is their identity standard.

think your parents would evaluate you as a student?" Again, ratings were collected using the same matrix of the six academic responsibility items rated from Extremely X (6) to Not at All X (0). Lastly, individuals were asked to rate themselves in response to the grade (self appraisals) along each of the six academic responsibility items from Extremely X (6) to Not at All X (0). Table 3.2 shows the principal component factor scores for academic responsibility (T1), reflected appraisals from friends and parents, and self-appraisals after receiving their grade on the mid-term exam (T3). These scores show the unidimensionality of the scales. All factor loadings are above .6 with omega reliability scores of .86 or above.

Table 3.2 Principal Component Factor Loadings for Self, Friend, and Parent Appraisals				N=288
	Identity Standard	Self T3	Friend T3	Parent T3
Studious	.63	.80	.92	.95
Ambitious	.67	.81	.92	.93
Motivated	.78	.91	.96	.97
Dedicated	.84	.91	.96	.98
Hardworking	.84	.90	.95	.97
Responsible	.64	.77	.90	.94
Eigenvalue	3.26	4.35	5.25	5.52
Ω	.86	.94	.98	.99

Squared Discrepancy Measures for Emotion Equations[20]

Three discrepancy measures were created from the self-appraisals, friend appraisals, and parent appraisal in response to the grade. The self, friend, and parent appraisal measures were created for each item (studious, hardworking, ambitious, dedicated, responsible, and motivated) by subtracting one's academic responsibility standard reported in the first survey from the

[20] Identity theory has measured identity discrepancies with both, a squared measure and an absolute value of the discrepancy (Burke and Stets 2009). To test which discrepancy has better fit, I regressed emotion on both, the absolute value and squared discrepancy measures in each model (self, parent, friend, and combined discrepancy). Neither discrepancy measure was significant in most cases, however, the p-value of the squared discrepancy measure was always lower than the absolute value discrepancy, suggesting the squared discrepancy was better suited for these analyses.

appraisal measure captured in the third survey, squaring it, and summing across all six items.[21] An additional discrepancy measure was created to understand the combined influence of all three discrepancies on emotions.[22] The combined discrepancy measure is the average of the squared discrepancies for self, friend, and parent. All four discrepancy scales were standardized to have a mean of 0 and a standard deviation of 1. A larger number indicates a greater squared identity discrepancy.

Discrepancy for Behavior Equations

Behavior is used to counteract a discrepancy so it is important to retain the sign of the discrepancy, whether an individual is being rated as a better student (positive discrepancy) or a worse student (negative discrepancy) than she thinks she is. Students receiving feedback that they are better students than they think they are (positive discrepancy) should enact fewer study behaviors to change feedback and bring it back in line with their identity meanings. The opposite is also true. Students receiving feedback that they are worse students than they think they are (negative discrepancy) should enact more study behaviors to change feedback so it is in line with their identity meanings.

The arithmetic difference between the academic responsibility standard and appraisals is used for behavior equations. Again, three discrepancy measures are created from self, friend, and parent appraisals. We take the standard for each item described above and subtract it from each of

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[21] For example: squared friend discrepancy = $(\text{studious}_{\text{friend}} - \text{studious}_{\text{std}})^2 + (\text{ambitious}_{\text{friend}} - \text{ambitious}_{\text{std}})^2 + (\text{hardworking}_{\text{friend}} - \text{hardworking}_{\text{std}})^2 + (\text{motivated}_{\text{friend}} - \text{motivated}_{\text{std}})^2 + (\text{dedicated}_{\text{friend}} - \text{dedicated}_{\text{std}})^2 + (\text{responsible}_{\text{friend}} - \text{responsible}_{\text{std}})^2$

[22] Discrepancies created from reflected appraisals of friend and parent(s) are highly correlated (r=.79*) and pose a multicollinearity issue. While the mean VIF for models including all three discrepancy measures (self, friend, and parent) are low, the model necessary to test Hypothesis 3 and 4 require that interaction terms of discrepancy*variance be included in the model. Including all three interaction terms is very problematic because all three interaction terms rely on the same identity variance measure when created. To avoid issues of multicollinearity, I have created the combined reflected appraisal measure to simulate the combined influence of all three discrepancies on the identity process.

the appraisal ratings.[23] These differences are then summed to create the self, friend, and parent discrepancy measures respectively. A combined discrepancy measure was created to examine the combined influence of the appraisals. This measure was created by averaging the three discrepancy measures (self, friend, and parent). These discrepancy measures were standardized to have a mean of 0 and standard deviation of 1. A larger number indicates a larger discrepancy.

Grade Discrepancy. A grade discrepancy is calculated by taking the arithmetic difference between one's actual grade and the grade the student thought they earned after they took the exam but before they received their actual grade. After students took the mid-term exam in their course, they were asked to fill out a survey (T2). This survey asked "What grade do you think you earned on this exam?" Students selected a letter grade from A+ to F, including pluses and minuses. Once students received their actual mid-term grades, they were asked to fill out another survey (T3). This survey asked "What grade did you receive on the exam?" Again, students selected a letter grade from A+ to F, including pluses and minuses. These grades were recoded into their numeric equivalents. For example, a C+ became 78, a C became 75, and a C- became 73. Two grade discrepancy measures were created, a squared grade discrepancy and grade discrepancy. The grade discrepancy is created by subtracting the grade students hoped to earn from the grade students actually earned on the exam. This difference is squared to create the squared grade discrepancy.[24] Both measures were standardized across respondents to have a mean of 0 and a standard deviation of 1. A higher score reflects a larger grade discrepancy.

Interaction Terms. Hypotheses 2 and 4 test the moderating effect of identity dispersion on the relationship between identity discrepancy and output (emotion and behavior). That is, the identity

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[23] For example: friend discrepancy = $(\text{studious}_{\text{friend}} - \text{studious}_{\text{std}}) + (\text{ambitious}_{\text{friend}} - \text{ambitious}_{\text{std}}) + (\text{hardworking}_{\text{friend}} - \text{hardworking}_{\text{std}}) + (\text{motivated}_{\text{friend}} - \text{motivated}_{\text{std}}) + (\text{dedicated}_{\text{friend}} - \text{dedicated}_{\text{std}}) + (\text{responsible}_{\text{friend}} - \text{responsible}_{\text{std}})$

[24] Squared grade discrepancy = $(\text{actual} - \text{expected})^2$

variance along the dimension of academic responsibility will dampen the effect of an identity discrepancy on negative emotion and behavior. In order to evaluate the moderating effect of identity variance on identity discrepancy and outcomes, I created interaction terms for all squared and difference identity discrepancy measures (self, friend, parent, and combined) by multiplying each discrepancy by one's identity variance. Each interaction term is the standardized appraisal multiplied by the standardized measure of dispersion of the student identity dimension academic responsibility (the variance).[25]

Control Variables

Sex (Female). Individuals were asked to report their sex at the end of the first survey. Female is coded 1 and male is coded 0.

Ethnicity. This sample is ethnically diverse and multiple ethnic categories have large numbers of participants. Multiple ethnic categories are retained as controls in the analysis. Individuals were asked to report their ethnicity by selecting the ethnicity that best describes them: White non-Hispanic/Caucasian, African American or Black, Hispanic, Asian, American Indian or Native American, Pacific Islander or Alaskan Native, Multi-racial, or Other. Individuals selecting "other" were asked to fill in their ethnicity. These entries were examined and some were recoded into existing categories. The largest ethnic categories in this sample are White, Hispanic and Asian. Individuals that selected African American, Multi-racial, American Indian or Native American, Pacific Islander or Alaskan Native or Other were combined into the Other category due to small numbers (N<10% of sample size). Four dummy variables were created: White, Hispanic, Asian, and Other. Hispanic is coded 1 for individuals reporting a Hispanic ethnicity, all others are coded 0. Asian is coded 1 for individuals reporting an Asian ethnicity, all others are

[25] Interaction terms create an issue of multicollinearity because each term is the product of two other variables included in the analysis. In this case, multicollinearity arises between the interaction terms, discrepancy, and identity dispersion measures. To resolve the issue, variables were standardized.

coded 0. Other is coded 1 for individuals reporting any other ethnicity, all others are coded 0. The reference category for ethnicity is White, coded 0 in all three variables.

Income. Participants were asked to report their parent's income last year. This variable includes 8 categories describing a range of income. This scale ranges from less than $10,000 to more than $100,000. Categories were coded to their mid-point for analysis then standardized to have a mean of 0 and a standard deviation of 1. Ten participants did not report income on this measure.[26] Income was imputed by regressing income on gender and ethnicity. Income was then predicted from the regression equation and used for individuals with missing data.

Analysis

Ordinary Least Squares Regression was used to determine the effects of identity discrepancy, identity dispersion and its moderating effect, and grade discrepancy on negative emotion and behavior change. OLS offers the best estimation because it provides unbiased linear estimators for each equation. Tests for constant error variance were run after estimating regression coefficients. Heteroskedasticity was detected and robust standard errors were used to estimate significance levels. Regression was performed for discrepancies caused by self-appraisal and the reflected appraisals for friend and parent separately because of the highly correlated nature of the discrepancy measures. This and the collinearity of the interaction terms of each discrepancy require that each equation be estimated separately. An additional set of regressions was run using the combined discrepancy measure to understand the cumulative effect of discrepancies on emotion and behavior. Appraisals from parents have the largest correlation with

[26] Imputation was carried out for the variable income because there were so few cases with missing data.

output in Tables 4.2a and 4.2b suggesting they have the largest impact on one's reaction to discrepancy.[27]

The first part of the analysis involves retesting identity theory's approach to the verification process, that a larger discrepancy leads to increased feelings of negative emotion (Hypothesis 1) and changes in behavior to counter the disturbance (Hypothesis 2). The second part of the analysis focuses on the moderating effect of identity dispersion on the verification process. OLS regression is used to examine how the combination of discrepancy paired with identity dispersion influences the amount of negative emotion felt (Hypothesis 3) and the amount of behavior change (Hypothesis 4). It is hypothesized that identity variance will moderate the effect of discrepancy on output by diminishing relationships. As a moderator, identity variance will decrease feelings of negative emotion and will increase projected study behaviors, reducing one's effectiveness at correcting a discrepancy.

A larger discrepancy typically results in feeling more negative emotion. A looser control system (more identity dispersion) should result in feelings of less negative emotion. A positive discrepancy, getting feedback that you are a better student than you think you are, should result in anticipating engaging in fewer study behaviors than for the previous exam. Similarly, a negative discrepancy, receiving feedback that you are a worse student than you think you are, should result in anticipating engaging in more study behaviors than for the previous exam. In both cases, behavior is adjusting to counteract the discrepancy. The moderating effect of identity dispersion should diminish this relationship because a looser system will be less effective at counteracting the disturbance. For example, a person with a negative discrepancy will enact more study

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[27] Multicollinearity bars us from comparing the strength of effects of sources of discrepancy on emotion and behavior. Each form of discrepancy does have an effect on output. It is possible that feedback from others is weighted differently by individuals when it is combined and compared to one's identity standard. A weighted measure was created, but is only a proxy for weighting since the same weights are used for all individuals in the sample.

behaviors to correct the problem. If we add the moderating effect of variance, we should see a smaller increase. That is, more identity dispersion should hinder the identity process. An individual with a negative discrepancy and higher dispersion will enact fewer study behaviors than a person with the same discrepancy but lower dispersion because a looser control system will be less effective at counteracting the discrepancy than a tighter control system (less dispersion). To test this, the direction of the identity discrepancy and grade discrepancy is retained in the analysis for regressions focusing on study behaviors (Hypothesis 2 and 4).

CHAPTER 4

RESULTS

Table 4.1 presents the mean and standard deviation for all variables. All of the variables with the exception of the squared discrepancy variables (self, parent, friend, combined, and grade) are normally distributed. The squared discrepancy variables are positively skewed with a majority of cases falling at the low end of the discrepancy scale. To test for linearity of relationships, I plotted observed values for each dependent variable against predicted values for each dependent variable after regressions were run. These tests showed linear relationships.

Tables 4.2a and 4.2b display the zero-order correlations with Bonferroni corrected significance levels for all variables included in the models (Holm 1979).[28] Variance in identity meanings is not highly correlated with any of the identity discrepancy measures suggesting each may operate independently. Squared identity discrepancies are significantly correlated with the other squared identity discrepancies (squared self, squared parent, squared friend, and squared combined) and arithmetic identity discrepancies are significantly correlated with the other arithmetic identity discrepancies (self, parent, friend, and combined). Discrepancies, both squared and arithmetic, created from reflected appraisals from parents and friends are moderately correlated with self discrepancy. Parent and friend discrepancy are highly correlated with each other (squared: r=.79*; arithmetic: r=.78*) suggesting that parents and friends may provide similar feedback to individuals. It should be noted that squared discrepancies are negatively correlated with their arithmetic counterparts indicating the largest discrepancies in the sample are negative. Higher levels of squared discrepancy, regardless of origin are correlated with higher reports of negative emotion. This is congruent with past findings in identity theory (Burke and

[28] Bonferroni correction was used because the amount of variables tested increases the likelihood that any relationship will be significant. Bonferroni correction calculates more conservative estimates, decreasing the likelihood of a Type I error.

Stets 2009). These correlations support identity theory and the relationships we would hope to find between identity discrepancy and negative emotions.

Turning to some of the correlations related to behavior, we focus on the arithmetic discrepancies. Behaviors should counteract a discrepancy such that getting feedback that one is a better student than he thinks he is should result in less studying for the next exam. This relationship is not significant in the correlation table. Similarly, a student should feel less negative emotion when receiving a grade higher than he thought he would get. We find that a bigger positive grade discrepancy is correlated with less negative emotion. Lastly a higher positive grade discrepancy is correlated with a higher positive parent appraisal discrepancy suggesting students may place more weight on their parents' views of them.

Table 4.1 Univariate Statistics for Variables				N=288
Variable	Mean	Std. Dev.	Min	Max
ID Dispersion	0.00	1.00	-2.10	3.35
Sq. Self Discrep	0.00	1.00	-0.84	7.72
Sq. Parent Discrep	0.00	1.00	-0.74	4.13
Sq. Friend Discrep	0.00	1.00	-0.73	6.04
Sq. Combined Discrep	0.00	1.00	-0.86	4.59
Dispersion X Sq. Self Disc	0.00	1.00	-0.63	7.41
Dispersion X Sq. Par Disc	0.00	1.00	-0.64	7.72
Dispersion X Sq. Frnd Disc	0.00	1.00	-0.73	4.96
Dispersion X Sq. Com Disc	0.00	1.00	-0.77	5.74
Self Discrep	0.00	1.00	-4.23	3.95
Parent Discrep	0.00	1.00	-2.68	2.32
Friend Discrep	0.00	1.00	-3.49	2.88
Combined Discrep	0.00	1.00	-3.30	3.34
Dispersion X Self Discrep	0.00	1.00	-5.52	5.22
Dispersion X Par Discrep	0.00	1.00	-5.12	3.03
Dispersion X Frnd Discrep	0.00	1.00	-3.57	4.05
Dispersion X Com Discrep	0.00	1.00	-4.05	4.43
Negative Emotion	0.00	1.00	-1.83	1.80
Change in Study Behavior	0.00	1.00	-3.51	2.36
Grade Discrepancy	0.00	1.00	-2.36	3.15
Sq. Grade Discrepancy	0.00	1.00	-0.65	3.62
Female	.72	.45	0	1
White	.20	.40	0	1
Asian	.31	.46	0	1
Hispanic	.32	.47	0	1
Other Ethnicity	.18	.39	0	1
Income	0.00	1.00	-1.19	1.84

Table 4.2a Correlations with Bonferroni Corrected Significance Levels														N=288
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1) ID Dispersion	1.00													
2) Sq. Self Discrep	.22	1.00												
3) Sq. Parent Discrep	.08	.29*	1.00											
4) Sq. Friend Discrep	.03	.37*	.79*	1.00										
5) Sq. Combined Discrep	.10	.49*	.95*	.92*	1.00									
6) Disper X Sq. Self Disc	.47*	.91*	.25*	.31*	.42*	1.00								
7) Disper X Sq. Par Disc	.38*	.34*	.85*	.55*	.77*	.40*	1.00							
8) Disper X Sq. Frnd Disc	.38*	.51*	.67*	.84*	.81*	.57*	.69*	1.00						
9) Disper X Sq. Com Disc	.46*	.57*	.80*	.68*	.83*	.65*	.93*	.74*	1.00					
10) Self Discrep	-.10	-.33*	-.18*	-.24*	-.26*	-.29*	-.19*	-.27*	-.27*	1.00				
11) Parent Discrep	-.05	-.11	-.80*	-.62*	-.73*	-.07	-.66*	-.51*	-.59*	.37*	1.00			
12) Friend Discrep	-.04	-.14	-.67*	-.76*	-.71*	-.11	-.50*	-.64*	-.54*	.47*	.78*	1.00		
13) Combined Discrep	-.06	-.20	-.72*	-.68*	-.73*	-.15	-.59*	-.59*	-.59*	.62*	.92*	.92*	1.00	
14) Disper X Self Disc	-.14	-.33*	-.16	-.20	-.23*	-.34*	-.22	-.29*	-.30*	.92*	.37*	.43*	.59*	1.00
15) Disper X Par Disc	-.22*	-.11	-.68*	-.44*	-.59*	-.14	-.75*	-.51*	-.66*	.40*	.90*	.66*	.83*	.48*
16) Disper X Frnd Disc	-.23*	-.17	-.55*	-.58*	-.58*	-.21	-.57*	-.68*	-.62*	.50*	.71*	.89*	.85*	.55*
17) Disper X Com Disc	-.24*	-.21	-.59*	-.49*	-.58*	-.24*	-.65*	-.59*	-.65*	.63*	.82*	.78*	.89*	.71*
18) Negative Emotion	.12	.18	.34*	.29*	.34*	.15	.28*	.25*	.29*	-.22*	-.35*	-.37*	-.38*	-.15
19) Change in Study Beh	.03	-.03	.14	.08	.11	-.06	.12	.05	.08	-.06	-.16	-.10	-.14	.02
20) Grade Discrepancy	-.01	.05	-.15	-.11	-.12	.02	-.15	-.11	-.12	.05	.23*	.19	.21	.02
21) Sq. Grade Discrep	.09	.03	.19	.14	.17	.03	.18	.15	.17	-.04	-.16	-.17	-.16	.01
22) Female	.01	.02	.11	.09	.10	-.01	.09	.07	.08	-.07	-.12	-.14	-.14	.00
23) White	-.04	-.07	-.04	-.07	-.07	-.06	-.02	-.05	-.04	-.05	-.01	.04	.00	-.07
24) Asian	.11	.02	.04	.00	.03	.03	.08	.05	.07	.06	-.03	.00	.00	.05
25) Hispanic	-.02	.03	.01	.05	.03	.04	-.01	.03	.01	-.05	-.01	-.07	-.04	-.04
26) Other Ethnicity	-.07	.01	-.01	.01	.00	-.03	-.05	-.04	-.05	.04	.05	.05	.06	.05
27) Income	-.08	-.06	.00	-.08	-.04	-.09	-.04	-.14	-.09	.07	-.04	.06	.02	.05

Table 4.2b Continued Correlations with Bonferroni Corrected Significance Levels													N=288
	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
15) Disper X Par Disc	1.00												
16) Disper X Frnd Disc	.77*	1.00											
17) Disper X Com Disc	.92*	.91*	1.00										
18) Negative Emotion	-.29*	-.30*	-.30*	1.00									
19) Change in Study Beh	-.12	-.06	-.08	.25*	1.00								
20) Grade Discrepancy	.22	.17	.18	-.28*	-.07	1.00							
21) Sq. Grade Discrep	-.14	-.16	-.13	.30*	.15	-.48*	1.00						
22) Female	-.08	-.10	-.08	.18	.22	-.12	.15	1.00					
23) White	-.03	.00	-.04	-.09	-.14	-.03	-.03	-.02	1.00				
24) Asian	-.04	-.02	-.02	.12	-.05	.04	-.03	-.07	-.33*	1.00			
25) Hispanic	.01	-.04	-.02	.00	.16	.01	.06	.06	-.34*	-.45*	1.00		
26) Other Ethnicity	.07	.08	.08	-.05	.01	-.03	-.01	.03	-.23*	-.31*	-.32*	1.00	
27) Income	-.03	.07	.03	-.05	.02	-.02	.03	-.12	.42*	-.04	-.30*	-.03	1.00

Turning now to this study's predications, Table 4.3 displays the results for Hypothesis 1 stating that a larger squared discrepancy will lead to greater feelings of negative emotion. The results show that as the squared identity discrepancy increases, participants feel more negative emotion. This is true for the discrepancy caused by self-appraisal (β=.18 $p < .05$), discrepancy from friend appraisal (β=.23 $p < .05$), and the discrepancy from parent appraisal (β=.27 $p < .05$). Finally, as the combined discrepancy compiled from self, friend, and parent discrepancies increases, more negative emotion is reported (β=.28 $p < .05$). These results are consistent with previous work on identity discrepancy within identity theory and support Hypothesis 1 (Burke and Stets 2009).

In looking at the coefficients for both grade discrepancy measures, we see that there are both positive and negative effects of grade discrepancy on negative emotion. In all four models (self, friend, parent, and combined squared discrepancies), a higher arithmetic grade discrepancy, receiving a higher grade than one expected, leads to less negative emotion while a squared grade discrepancy leads to more negative emotion. As the actual grade deviates more from one's expected grade, individuals feel more negative emotion but this negative emotion is affected by the positivity of the grade discrepancy, how much higher one's actual grade is when compared to the expected grade. Individuals with a higher grade than they anticipated feel less negative emotion than those with lower grades than anticipated though all individuals feel some degree of negative emotion as a result of experiencing a grade discrepancy. I also find that females and Asian students feel more negative emotion overall across all four models.

Table 4.3 Standardized OLS Regression of Negative Emotion on Squared Discrepancy				N=288
	Neg. Emotion	Neg. Emotion	Neg. Emotion	Neg. Emotion
Sq. Self Discrep	.18**	--	--	--
Sq. Friend Discrep	--	.23**	--	--
Sq. Parent Discrep	--	--	.27**	--
Sq. Combined Disc	--	--	--	.28**
Grade Discrep	-.19**	-.16**	-.15**	-.16**
Sq. Grade Discrep	.19**	.17**	.16**	.16**
Female	.14**	.12**	.12**	.12**
Asian	.16**	.16**	.15**	.15**
Hispanic	ns	ns	ns	ns
Other	ns	ns	ns	ns
Income	ns	ns	ns	ns
R^2	.18	.21	.22	.23

** p<.05 (two-tailed)

To examine the effect of discrepancy on behavior, I regressed changes in study behavior on identity discrepancy from each of several sources (self, friend, and parent) and the combined discrepancy. Identity theory predicts that behavior will change to reduce identity discrepancy (Hypothesis 2). Here, it is important to retain the direction of both the identity discrepancy and the grade discrepancy. Appraisals (self, reflected, and direct) can be described in terms of over- or under-evaluation. A person can receive feedback that they are a better student than they think they are (over-evaluation or positive discrepancy) or a worse student than they think they are in this study (under-evaluation or negative discrepancy).[29] Individuals experiencing a positive discrepancy should exhibit a reduction in study behavior to counteract the over-evaluation and to obtain feedback more aligned with her self-view. Individuals experiencing a negative discrepancy should exhibit more study behaviors to counteract the under-evaluation and to obtain feedback aligned with their self-view. We expect the coefficient on behavior change to be negative

[29] It should be noted that all identities cannot be evaluated similarly in terms of being better or worse than one thinks s/he is. In cases where a role is not involved, over- or under-evaluation of identity may be in terms of receiving feedback that one is more X or less X than s/he thinks she is. Over-evaluation of the dominance identity, for example would mean a person is rated as being more dominant than s/he thinks s/he is while an under-evaluation would mean a person is rated less dominant than s/he thinks s/he is.

showing behavior is counteracting the direction of the discrepancy. The direction of the discrepancies are retained for these analyses.

This study hypothesizes that a larger, positive identity discrepancy to the student identity as a result of a grade discrepancy[30] on an exam will decrease the amount of change in study behaviors a student performs in studying for the next exam. Similarly, a larger negative identity discrepancy as a result of a negative grade discrepancy should result in an increase in study behaviors for the next exam. In both cases, the student is altering his/her study strategy to compensate for the discrepancy. Earning a higher grade than one expects should lead to a decrease in study behaviors for the next exam while earning a lower grade than one expects should result in an increase in study behaviors.

The results are displayed in Table 4.4. Discrepancy caused by self and friend appraisals are not related to behavior change. A discrepancy to the dimension academic responsibility caused by the reflected appraisals of one's parent does show a significant negative influence on changes in study behavior (β=-.13 $p < .05$). In other words, as discrepancy to the student identity dimension academic responsibility caused by a parent's imagined appraisals increase (over-evaluation), s/he will anticipate engaging in fewer study behaviors in preparation for the next exam. Alternatively, the larger the discrepancy to the student identity dimension academic responsibility in a negative direction (under-evaluation), the more study behaviors s/he will anticipate engaging in. When all three discrepancy measures are combined, I find that a larger positive discrepancy results in engagement in fewer study behaviors for the next exam (β=-.10 $p < .05$), while a negative discrepancy increases study behavior.

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[30] One's grade on an exam is a direct appraisal of one's performance as a student. Feedback from the exam is the focus for gathering self and reflected appraisals in this study. Thus, a grade on the exam should influence one's self and reflected appraisals. These discrepancies should influence changes in study behaviors in preparation for the next exam in the course.

Overall, it seems that behavior change does occur to counteract over- or under-evaluation of the student identity dimension academic responsibility. Hypothesis 2 is supported with parent and combined appraisals but not with self or friend appraisals. This suggests that the evaluator may be important in determining when behavior change is necessary to counteract an identity discrepancy. We do see that when behavior change occurs, it counteracts the discrepancy as predicted by identity theory. Though this hypothesis is not supported by all forms of appraisals, it may be possible that one's identity dispersion will alter the relationship between discrepancy and behavior.

In reference to the control variables, we see that females anticipate a larger increase in study behaviors than males. That is, they report they will engage in more study behaviors for the next exam. All ethnic categories report they will study more for the next exam in comparison to Whites. Individuals with higher income also report that they will study more for the next exam.

Table 4.4. Standardized OLS Regression of Behavior Change on Discrepancy N=288

	Behavior Chg.	Behavior Chg.	Behavior Chg.	Behavior Chg.
Self Discrep	ns	--	--	--
Friend Discrep	--	ns	--	--
Parent Discrep	--	--	-.13**	--
Combined Discrep	--	--	--	-.10*
Grade Discrep	ns	ns	ns	ns
Female	.22**	.21**	.21**	.21**
Asian	.17**	.17**	.16**	.17**
Hispanic	.33**	.32**	.32**	.32**
Other	.16**	.16**	.16**	.16**
Income	.16**	.16**	.15**	.16**
R^2	.10	.10	.11	.11

** p<.05 (two-tailed)

Effects of Dispersion

The next models examine the moderating effects of identity dispersion on the relationship between discrepancies and outcomes (negative emotion and behavior). To achieve this, I include an interaction term of identity dispersion multiplied by discrepancy in the models and control for grade discrepancy since the appraisal measures are in reference to one's reaction to the grade on

their mid-term exam. Hypothesis 3 states that as identity dispersion increases, the relationship between negative emotion and squared discrepancy will be reduced. Separate models are run for each type of squared identity discrepancy (self, friend, and parent) along with a regression for combined discrepancy. Table 4.5 displays the results for an individual experiencing an average level of squared discrepancy. Coefficients indicate a positive relationship between squared discrepancy and negative emotion. As squared discrepancy increases, the self experiences more negative emotion, as identity theory would predict. These results are found for self discrepancy (β=.41 $p< .05$), friend discrepancy (β=.41 $p< .05$), parent discrepancy (β=.45 $p< .05$), and combined discrepancy (β=.45 $p< .05$).

When examining the moderating effect of identity dispersion on this process, I find an inverse relationship between the interaction effect (identity dispersion multiplied by discrepancy) and negative emotion. Having more identity dispersion buffers the effect of the discrepancy such that a person will feel less negative emotion with more identity dispersion at a fixed level of self discrepancy (β= -.29 $p< .05$). The moderating effect is significant in relation to friend discrepancy (β= -.24 $p< .05$), the parent discrepancy (β= -.23 $p< .05$) and combined discrepancy (β= -.23 $p< .05$). Hypothesis 3 is supported with all sources of discrepancy (self, friend, parent, and the combined measure).[31]

The moderating effect is best described in comparing two individuals with different levels of dispersion. Suppose we have two individuals with the same size parent discrepancy of 1. We suppose one person (P1) has an identity dispersion of 1 while the other (P2) has a lower

[31] The coefficients are very similar across all models in the analyses for the discrepancy measures. It should also be noted that across each of the four models, the R^2 does not change significantly, indicating these models are also very similar. We would expect an increase in the R^2 of the model including the combined discrepancy to indicate inclusion of all types of discrepancy is better than any single measure. Findings do not indicate any of the discrepancy measures are better predictors of emotional outcomes than the others suggesting individuals are not discriminating between the different types appraisals.

identity dispersion of .5. Since both individuals have the same size discrepancy (1), each individual experiences the same size increase in emotion (.45), the coefficient associated with discrepancy. Next, we multiply their identity dispersion by the coefficient for the moderating effect. Since person 1 has an identity dispersion of 1, we multiply the coefficient for the interaction term by 1 (P1: 1-.23= -.23). Person 2 has a dispersion of .5 so we multiply that by the interaction term (P2: 5*-.23= -.115). We then add all of these together to get the negative emotion scores for each individual (P1: .45-.23= .22 and P2: .45-.115= .335). We see that overall, Person 1, with a higher identity dispersion, experiences less negative emotion (.22) than Person 2 with lower identity variance (.335). This example shows that as an individual's identity dispersion increases, it acts to buffer the effect of the discrepancy on one's feelings of negative emotion such that individuals with more identity dispersion feel less negative emotion when experiencing a discrepancy of the same size as an individuals with more identity dispersion.

In looking at the remaining effects in the table, we see that across all four models, identity dispersion has a direct positive effect on negative emotion. Individuals with more dispersion in identity meanings feel more negative emotion overall. Perhaps having a more widely distributed meaning set makes a person distressed because they may be uncertain of their identity meanings. We also see both, linear and curvilinear effects of grade discrepancy on emotion. Individuals feel less negative emotion when they receive a grade higher than they expected but feel more negative emotion as the magnitude of this discrepancy increases (squared grade discrepancy). This again, suggests that individuals feel better in being over-rewarded from a direct appraisal but feel negatively overall because this evaluation is not aligned with their self-view. When the two coefficients are combined, the curvilinear distribution illustrating the relationship between negative emotion is moved to the right on the Cartesian scale indicating individuals feel the least negative emotion when experiencing a slight positive grade discrepancy

rather than no grade discrepancy. Lastly, we still see that female and Asian participants feel more negative emotion overall.

Table 4.5. Standardized OLS Regression of Negative Emotion on Squared Discrepancy and Identity Dispersion N=288

	Neg. Emotion	Neg. Emotion	Neg. Emotion	Neg. Emotion
Sq. Self Discrep	.41**	--	--	--
Sq. Friend Discrep	--	.41**	--	--
Sq. Parent Discrep	--	--	.45**	--
Sq. Combined Disc	--	--	--	.45**
Identity Dispersion	.13*	.16**	.14**	.15**
Dispersion X Disc	-.29*	-.22*	-.23*	-.23*
Grade Discrep	-.20**	-.17**	-.16**	-.17**
Sq. Grade Discrep	.17**	.16**	.15**	.15**
Female	.13**	.12**	.12**	.12**
Asian	.15**	.15**	.14**	.14**
Hispanic	ns	ns	ns	ns
Other	ns	ns	ns	ns
Income	ns	ns	ns	ns
R^2	.19	.22	.23	.21

** p<.05 (two-tailed) *p<.05 (one-tailed) †p<.10 (one-tailed)

Hypothesis 4 states that as identity dispersion increases, the effect of discrepancy on change in behavior will diminish. In other words, the moderating effect of identity dispersion should act to dampen the relationship between one's behaviors and identity discrepancy. We expect a negative coefficient for behavior change. A positive discrepancy should lead to fewer study behaviors than previously enacted while a negative discrepancy should lead to more study behaviors than previously enacted to counteract that discrepancy. The moderating effect of identity dispersion should diminish this relationship and should result in a positive coefficient in the regression. A positive coefficient for the moderating effect will indicate that individuals with more identity dispersion will be less effective at correcting the discrepancy.

For example, an individual experiencing a negative discrepancy will enact more study behaviors to correct the discrepancy. If we add the effect of having high identity dispersion to that discrepancy, he will experience a larger dampening effect on behavior change due to this interaction. The individual will engage in fewer corrective behaviors to correct the discrepancy.

To examine the moderating effect of identity dispersion and identity discrepancy on behavior change, I regressed the interaction term of dispersion and discrepancy on behavior change. Again, the direction of all discrepancies were retained since identity theory predicts that one's behavior will counteract the direction of the discrepancy.[32] The results are displayed in Table 4.6.

When examining all forms of discrepancy, I find that as the discrepancy gets larger and more positive, anticipated study behaviors decrease, indicating a negative relationship (self: β= -.38 $p< .05$; friend: β= -.18 $p< .10$; parent: β= -.23 $p< .05$; combined: β= -.28 $p< .05$). This finding also means that as discrepancy becomes negative, study behaviors increase. In reference to the moderating effect of dispersion on discrepancy, I find that the moderating effect increases the amount of behaviors enacted in the presence of discrepancy for a discrepancy resulting from self-appraisals (β= .36 $p< .05$) and is marginally significant for the combined discrepancy measure (β= .20 $p< .10$). The moderating effects of identity dispersion on discrepancy and behavior are not significant for friend or parent discrepancies. Identity dispersion does not have a direct effect on behavior change. Overall Hypothesis 4 is not uniformly supported across all types of discrepancy, it is only supported with a self-discrepancy.

We can again, explain this moderating effect by comparing two individuals with different levels of dispersion but experiencing the same size self-discrepancy of 1. Note that this is an over-evaluation since discrepancies for the behavior models are not squared. Again, we suppose one person (P1) has an identity dispersion of 1 while the other (P2) has a lower identity dispersion of .5. Since both individuals have the same size discrepancy (1), each individual experiences the same size increase in behavior of -.38, the coefficient associated with discrepancy. This negative coefficient indicates that these individuals will enact fewer study

[32] Recall that a positive discrepancy denotes over-evaluation and a negative discrepancy denotes under-evaluation.

behaviors for their next exam because of this over-evaluation. Next, we multiply their identity dispersion by the coefficient for the moderating effect. Since person 1 has an identity dispersion of 1, we multiply the coefficient for the interaction term by 1 (P1: 1*.36= .36). Person 2 has a dispersion of .5 so we multiply that by the interaction term (P2: 5*.36= .18). We then add all of these together to get the behavior scores for each individual (P1: -.38+.36= -.02 and P2: -.38+.18 = -.20). We see that overall, Person 1, with higher identity dispersion, enacts more behaviors (-.02) than Person 2 having lower identity dispersion (-.20). This example shows that as an individual's identity dispersion increases, it acts to buffer the effect of the discrepancy on one's behavioral output such that individuals with more identity dispersion feel are less effective at correcting a discrepancy. We see that both individuals enact fewer study behaviors to counteract their positive discrepancy. A more effective system (tighter control and less identity dispersion) enacts even fewer behaviors to counteract that disturbance than a less effective system (looser control and more identity dispersion).

In examining our controls, we see that females, non-White individuals, and individuals reporting higher household income report more change in study behaviors, anticipating studying more for the next exam in their course. These results and their implications for identity theory and future research will be discussed in the next chapter.

Table 4.6. Standardized OLS Regression of Behavior Change on Discrepancy and Identity Dispersion N=288				
	Behavior Chg.	Behavior Chg.	Behavior Chg.	Behavior Chg.
Self Discrep	-.38**	--	--	--
Friend Discrep	--	-.18†	--	--
Parent Discrep	--	--	-.23*	--
Combined Discrep	--	--	--	-.28**
Identity Dispersion	ns	ns	ns	ns
Dispersion X Disc	.36**	ns	ns	.20†
Grade Discrep	ns	ns	ns	ns
Female	.20**	.21**	.21**	.20**
Asian	.16**	.16*	.16*	.16*
Hispanic	.32**	.31**	.31**	.31**
Other	.15**	.15**	.16**	.16**
Income	.16**	.16**	.15**	.16**
R^2	.12	.11	.12	.12

** p<.05 (two-tailed) *p<.05 (one-tailed) †p<.10 (one-tailed)

CHAPTER 5

DISCUSSION

This dissertation sought to elaborate identity theory by investigating the dynamics of tightness of control and its relation to the identity verification process. Tightness of control describes how tightly an identity is maintained and how closely it is monitored when enacted in a situation. Identity theory states that when individuals' identity meanings are not supported in situations, they experience negative emotion and they alter their behavior to change the meanings in the situation to align with their identity meanings (Burke and Stets 2009). This dissertation extended identity theory by presenting a discussion of the role of tightness of control and its relation to an identity's salience, prominence, commitment, and emotional and behavioral output in response to a discrepancy.

Identity theory describes the cybernetic process individuals use to maintain identity meanings in situations. Recall that individuals have identities which are comprised of the meanings one attributes to one's self. Individuals seek feedback from others in situations that supports that self-view. When feedback from others does not match one's self-relevant identity meanings, the individual experiences a discrepancy. When these meanings do match, the individual experiences identity verification. When a discrepancy occurs, individuals feel negative emotion and are motivated to correct the discrepancy by changing the self-relevant meanings in the situation through changing their own behavior, changing their perceptions of the situation, and potentially changing identity standard meanings (Burke and Stets 2009). The goal in this process is to obtain feedback in the situation that matches one's identity meanings.

Control systems, like the one used in identity theory, vary in how tightly controlled they are (Powers 1973). Control systems are used to maintain a level of a unit. For example, thermostats maintain the temperature in a room, identity control systems maintain identity

meanings, and steam engines maintain speed. Each control system contains a standard, a set point that the unit should achieve and maintain. The current state of the unit in the situation is compared to the set point. The tightness of control of a system determines how closely the unit is maintained to the standard. Systems with tighter control will recognize a discrepancy more quickly and will react more effectively to counteract the disturbance (Powers 1973). The tightness of control of a system is described by the concept of loop gain.

Loop gain is the ratio of the system's reaction to the disturbance to the magnitude of the disturbance. That is, if we wanted to test the tightness of control of a system maintaining water pressure, we would introduce a specific level of disturbance to the system and measure how the system corrects it. We may measure how long it takes the system to readjust the water pressure to the correct level, for example. The larger this ratio (loop gain), the more tightly controlled the system is (Powers 1973). Rather than measuring tightness of control of an identity with loop gain, we use dispersion of identity meanings.

Individuals have an identity standard that is comprised of the meanings associated with their identity. For example, as a student, I may see myself as very hardworking and very motivated. These meanings are a part of my identity standard for my student identity. At times, I may see myself as somewhat hardworking or even not very hardworking. Along with this, I may potentially see myself as extremely motivated and at other times, not very motivated. These alterative meanings would be a part of the distribution of meaning around my identity standard. Because these alternative meanings are a part of my self-concept, I may not be as affected by feedback that is not aligned with my standard of very hardworking and very motivated. The more meanings, an individual has in their meaning distribution, the more loosely controlled that identity is. These individuals are more flexible in situations and may not be as affected by discrepancies. More dispersion, or spread, in identity meanings indicates a loosely controlled

system. In this way, loop gain is inversely related to identity dispersion. In the case of loop gain, a larger ratio between reaction and disturbance represents tighter control whereas more dispersion indicates looser control.

Theory outlined in this dissertation indicates that identities have varying levels of control such that identities that are enacted more frequently (salient), identities that are more important to an individual, and identities that are tied to many others are more tightly controlled. These ideas will need to be tested in future research. Hypothesis tests indicate that identities with more tightness of control are more sensitive to discrepancy. Recall, a discrepancy occurs when there is a mismatch between self-relevant situation meanings and one's identity standard (self-view in reference to an identity). Greater sensitivity to discrepancy leads to a more intense emotional response and should lead to a stronger behavioral response to bring self-relevant situational meanings into alignment with identity standard meanings. The relationship between tightness of control of an identity and output (emotion and behavior) in the presence of discrepancy was tested using data from students taking the same class at a large southwestern university. It was found that a discrepancy to an identity that is more tightly controlled results in a more intense negative emotional response than a less tightly controlled identity. Some evidence was found suggesting a more intense behavioral response results when a discrepancy occurs to a more tightly controlled identity as well. The details of these relationships and their implications follow.

Identity Discrepancy and Emotion

Previous research in identity theory has found that the intensity of an emotional response is linked to the size of the discrepancy such that the larger the discrepancy, the more intense the emotional output (Burke and Harrod 2005; Burke and Stets 1999; Burke and Stets 2009). These findings were replicated in this dissertation providing more support for the relationship between discrepancy and emotion. The larger the discrepancy for the student identity along the dimension

academic responsibility, the more intense the negative emotion felt regardless of the type of appraisal. That is, a discrepancy in relation to self, friend, parent, and the combined appraisal measure results in a more intense emotional response.

This dissertation's focus is on the influence of tightness of the control system on output (emotion and behavior) when a discrepancy is present. Since more tightly controlled systems are more sensitive to discrepancy, the system will recognize a discrepancy more quickly than a looser system and will act to correct the discrepancy more quickly through a more intense response. To test this relationship, it was necessary to include an interaction term of identity dispersion (inversely related to sensitivity to discrepancy) and identity discrepancy. The tightness of control of the identity acts to alter the effect of discrepancy on emotion such that people with more sensitive identities should feel more negative emotion than those with less sensitive identities for a given amount of discrepancy or non-verification. These findings were supported.

These findings indicate that a measure of tightness of control of identities is an important addition to further understand the dynamics of the verification process. Individuals with more tightly controlled identities experience discrepancy differently than individuals with less tightly controlled identities. One's sensitivity to discrepancy (tightness of control) acts to moderate the link between discrepancy and negative emotion such that individuals with less identity variance (more sensitivity) feel more negative emotion in response to a discrepancy than individuals with more identity variance (less sensitivity). The underlying identity control process still holds -- individuals experience more intense emotion with a larger discrepancy. Individuals with more tightly controlled identities feel an even more intense emotional response than individuals with less tightly controlled identities.

Identity Discrepancy and Behavior

Identity theory suggests that people act to reduce the experienced discrepancy by changing meanings in the situation (Burke and Stets 2009). Behavior can be in the form of overt action in a situation or can involve various internal strategies to change one's own perceptions of the situation. The goal of behavior is to alter identity-relevant situation meanings so they are aligned with identity standard meanings. When discrepancy occurs, behaviors are enacted to counteract the discrepancy. If a person receives feedback that she is a better student than she thinks she is (positive discrepancy), the individual will enact fewer student-like behaviors to acquire feedback aligned with her student identity. Similarly, if an individual receives feedback that she is a worse student than she thinks she is (negative discrepancy), she will enact more student-like behaviors to obtain feedback aligned with her student identity.

Hypotheses involving behavior focused on changes in students' study habits in preparation for an exam. Since the focus of this study was related to students' experience with an exam in their course, study habits are one class of behaviors related to success on an exam. In the present study, students were asked about their study behaviors in preparation for their mid-term exam. When grades on the mid-term exam were handed back, they were asked what they were going to do to prepare for the next mid-term exam scheduled the following week in the same course. The meaning of behaviors enacted have been shown to have meaning consistent with the identity they are meant to sustain (Burke and Reitzes 1981; Reitzes 1980). Regressions were run to test behavior as a direct output of experiencing a discrepancy to the student identity dimension academic responsibility. Since behavior is used as a strategy to decrease a discrepancy, the sign of the discrepancy was retained.

The direct effect of discrepancy on behavior was only found significant in relation to parent and combined appraisal measures. This suggests a parent's appraisal may be more

important than either self or friend appraisals in determining study behaviors for the student identity. This finding suggests that all appraisals are not weighted the same in the identity control process. That is, appraisals from individuals more important to the self or individuals deemed more able to evaluate the self according to a given identity may carry more weight when combined with feedback in the situation. This idea has been suggested in past theory (Burke and Stets 2009; McCall and Simmons 1966). This factor should be investigated in the future by asking individuals to rate appraisers by importance and estimated ability to evaluate the self for a given identity. For example, a graduate student may place more value on the feedback from his adviser about how well he is fulfilling his graduate student role than his high-school educated parents because his parents have no experience with graduate school and have little understanding of the graduate student role.

While behavior is not a direct output of discrepancy across all forms of appraisals (self and friend are not significant), the moderating effect of identity dispersion was also explored. Past theory suggests that more tightly controlled systems are more effective at correcting a disturbance (Powers 1973). For this study, individuals with more tightly controlled student identities should enact a more intense behavioral response to correct a discrepancy. Findings show that individuals with a more tightly controlled identity anticipate enacting more behaviors to correct a discrepancy. Individuals with less identity dispersion (tighter control) exhibited a stronger behavioral reaction to a discrepancy to counteract the disturbance than those with more identity dispersion (looser control). These findings were supported with an identity discrepancy due to one's self-evaluation only. This finding suggests that the moderating effect of the tightness of one's identity on behavioral output in the presence of discrepancy is more complex. Future research needs to investigate the complexity of this relationship. It is possible the behaviors measured in this study are not adequately measuring the strength of one's behavioral reaction to a

discrepancy because the measure simply adds the number of behaviors an individual enacted in the past and anticipates enacting in the future. This limitation is discussed in more detail below.

LIMITATIONS AND FUTURE RESEARCH

Properties of Identities

One of the limitations of this study is that it examines sensitivity to discrepancy in respect to a role identity. Identity theory discusses person and social identities as well. All three bases of identity (role, person, and social) are theorized to operate in the same manner within the identity control system and should therefore possess an aspect of tightness of control. Now that evidence has been found that dispersion of identity meanings impacts the verification process, it will be important to determine if these dynamics are upheld with person and social identities as well. Since these identities are theorized to operate in the same manner, it is likely that tightness of control operates in the same way, that experiencing a discrepancy with a more tightly controlled identity, whether person, role or social, will result in a more intense response from the individual.

In investigating other bases of identities, it will be possible to test the differences in tightness of control between each class of identities (person, role, or social), that is whether a class of identities are overall more tightly controlled than the others. If person identities act as master identities (Stets 1995), they are more likely to be activated across situations and are likely to be enacted more often. Thus, person identities should have greater salience as a class of identities than both role and social identities. It is possible that along with greater salience, person identities may also carry greater tightness of control because they are both activated more often, and more central to one's self-view (more prominent). By exploring tightness of control of different bases of identities within a person simultaneously, differences in tightness of control can be established. Establishing this relationship will help identity researchers to better understand what happens when a person experiences a discrepancy. It is possible that individuals feel more

intense responses to discrepancies for person identities when compared to role and social identities, for example.

Another limitation of this study is that it did not test the relationship of factors that may contribute to tightness of control of identities. Identities vary in salience, prominence, and commitment (Burke and Stets 2009; Stryker 1980; Stryker and Serpe 1994). Each of these factors plays a role in the likelihood an identity will be activated in situations, the congruence of behaviors and identity meanings, and have been hypothesized to moderate the verification process. It is likely that identities with more salience, prominence, and commitment will also be more tightly controlled because they are enacted more often and are more central to one's self. If these properties do not influence dispersion of identity meanings, investigation into how tightness of the control system is determined will be necessary.

Properties of Input

The present study found that discrepancies resulting from some appraisals were significantly related to output over others. For example, a discrepancy from the appraisals of a parent influenced one's behavioral response to the discrepancy while self and friend appraisals did not predict a change in behavioral response. This finding suggests that appraisals may not be weighed the same when combined and compared to one's identity standard. Past identity research and theory has also suggested that the importance of the individual providing feedback to the self will impact how the feedback from those others will be processed (Burke and Stets 2009; McCall and Simmons 1966). Findings also show that status can impact one's self-view (Cast, Stets and Burke 1999). It is possible these factors will also impact how a discrepancy is experienced by the self.

Currently, feedback is weighted equally in determining a discrepancy. Oftentimes, studies gather reflected appraisals from one source, such as spouse, and the influence of the

significance of others has not been investigated. Studies assume the individuals used as the source of reflected appraisals are significant to the individual. If we were to expand our understanding of feedback to include the significance of others to the self as a source for reflected appraisals, we can begin to understand the dynamics of how feedback is weighted by the self when processed (how important the other is to the self), and can get a better idea of how reflected appraisals impact the size of the discrepancy and the intensity of the response.

While the importance of individuals to the self may influence how feedback is interpreted, the importance of the situation may also play a role in how discrepancy is experienced. Situations that carry a lot of weight for the individual may have larger impacts on the self if a discrepancy occurs. In relation to this study, the importance of the class to the student may have impacted both how they performed on the exam and the way their actual grade on the exam affected their self-view as a student. This study did not ask students how important this course was to them. As educators, many are familiar with students that do not seem invested or interested in their coursework. It is possible that a course unimportant to a student will have less impact on their self-view than a course more important to them when an experience in the course is the source of a discrepancy.

Properties of Output

This study focused on actions that can be used to correct a discrepancy to the student identity dimension academic responsibility. Since the target situation for this study involved a student's experience with an exam in their course, behaviors sampled were related to studying in preparation for the exam. While the behaviors provided were representative of common behaviors used to study for exams that are relevant for the identity dimension academic responsibility, it is possible that students engaged in other behavioral strategies to correct any discrepancies they felt.

The limitation of this study is that it focuses on one class of behaviors, specifically, how individuals will adjust study behaviors for their next exam.

While behavior can be in the form of direct action, for example, by changing one's study habits in hopes of earning a different grade on a future exam, a behavior can also occur internally through the change of perceptions or through change in the identity standard. For example, one can ignore feedback from various individuals by justifying that they do not understand the identity being controlled and are therefore unable to provide adequate feedback on how the self is acting, one can engage in selective perception of feedback by paying attention to feedback that supports one's identity and ignoring feedback that does not support one's identity, selective interpretation of feedback by interpreting all feedback as supporting one's identity, among others (McCall and Simmons 1966). In order to better understand the influence of tightness of control on behavior, future research should focus on a broader understanding of strategies used to correct discrepancies by attempting to measure the ways individuals change perceptions in the situation. The challenge will be in developing measures to assess whether individuals are using selective perception, selective interpretation, and other strategies.

Identity Dispersion Measure

The measure used to establish identity dispersion may be somewhat complex in nature if used for more than a few identity meanings. Past studies have examined identities that have up to 34 meanings associated with them. The gender identity has been tested with 34 meanings with a subset being highly useful in discriminating between girls and boys (Burke and Tully 1977), the moral identity is comprised of 12 meanings (Stets and Carter 2006), and the student identity has been tested using 24 meanings (Reitzes and Burke 1980). The identity distribution measure requires individuals to assess how well seven statements fit with their self-view. If all 24 student identity meanings were to be assessed, individuals would have had to answer 168 questions

associated with that identity. Because of the potential for fatigue in filling out the identity distribution measure, this study focused on a subset of six meanings for the student identity dimension academic responsibility.

The nature and success of the current measure should be tested using a full set of identity meanings to see if fatigue plays a role in the reliability of the measure. Some individuals had trouble following the directions associated with the measure, suggesting the measure may need to be redesigned. An alternate way of measuring dispersion of identity meanings may be to augment the current scale by collapsing the fit descriptors along the left side of the matrix from 11 possible answers to 5 or 6 possible answers. Providing fewer fit categories may make it easier for individuals to interpret what each position of fit means for the self. Another alternate that would further simplify the measure would be to ask individuals to select their identity standard and then to select a range of acceptable meaning along the scale without reference to degree of fit to their self-view. We would lose information about how well each position fits with one's self-view and would have to rely on range as a measure of dispersion. Future research should test these alternate measures to determine the best way to understand individuals' meaning structures.

Another aspect of dispersion that may affect individuals' response to discrepancy is the skewness of their distribution of meaning. Individuals' distributions are naturally dispersed around their identity standard. Many of these distributions are not symmetric in that the identity standard will be placed at one end of the continuum of meaning over the other. This opens up the possibility that individuals can experience larger discrepancies at one end of the scale over the other. For example, if an individual believes they are very hardworking (6) on a scale ranging from extremely hardworking (6) to not at all hardworking (0), they can only experience a small positive discrepancy but can experience larger negative discrepancies. The main question here is

if a positive and a negative discrepancy in a skewed distribution are experienced in the same manner.

In having individuals rate how well each position along a continuum of meaning fits their self-view, we establish their distribution of meaning. In this way, each position along the continuum from Extremely X (6) to Not at all X (0) are weighted by their fit to one's self-view. Obtaining feedback that is aligned with a position rated with higher fit to one's self-view may generate a weaker response than feedback aligned with a position rated with low fit. To illustrate more clearly, Figure 2.2 shows hypothetical meaning distributions for two individuals for the identity meaning of studious. The image shows that both individuals have an identity standard of 4 and illustrates a negative discrepancy of 1. If we account for the fit of the point at which the discrepancy line intersects the distribution, we will see that Person B rates the negative feedback (3) as fitting with their self-view more so than Person A. Since Person B rates the position of a 3 as better fitting to their self-view than person A, she may experience a less intense reaction to that discrepancy because of it is closer in fit to her self-view. While it is true that this individual also has a loosely controlled system and would have a less intense reaction to the discrepancy compared to Person A based on their dispersion of meanings, it is possible to have two individuals with the same dispersion, the same identity standard, but different fit ratings of the meanings around that identity standard. This illustrates that the degree of fit with one's self-view in relation to an identity may be important in accounting for how individuals experience discrepancies.

PRACTICAL APPLICATION

An understanding of tightness of control of identities can be of use in clinical settings. It can also help individuals to better understand themselves and others. We can use this research to better understand how individuals cope with information that is at odds with their self-view.

Knowing that some individuals monitor some identities more than others will help us understand why some individuals get upset over what others may deem no big deal. As we learn more about the influence tightness of control has on the way individuals deal with discrepancies, we can potentially help people to better manage situations in which their identities are challenged.

More specifically, this study can also aid in furthering our understanding of the role of the student identity in student behavior. While this study did not find much of a relationship between identity tightness and behavior, a deeper understanding of this relationship can allow us to predict which students are more likely to persist in the face of failure in classes and which students are more likely to finish their degree. Once the relationship is established between tightness of control and behaviors, we may be able to create programs to increase student success.

CONCLUSION

This study broadened our understanding of identity theory by exploring the concept of tightness of control of identities. Control systems contain a mechanism that controls perception in the face of disturbances. It is inefficient for a system to fix every deviation from its standard. A measure was developed to estimate one's dispersion of identity meanings as a proxy for the tightness of control of that identity. This measure was used to investigate how tightness of control influences emotion and behavior of the identity control system. Findings indicate that the tightness of control of an identity serves to moderate the output of the identity system. Individuals with more tightly controlled identities experience more intense negative emotion and enact stronger behaviors to correct the discrepancy. Emotions were also found to mediate the relationships between discrepancy and behavior such that feeling more negative emotion leads to enactment of more behaviors to rid a discrepancy.

These findings will allow researchers to better explain the verification process and the way the identity control system works. It also allows further exploration into the way

discrepancies are experienced by individuals. I have shown that a discrepancy of the same magnitude results in different outcomes for individuals with varying tightness of control of an identity. The control system still operates the same as past results have found, that larger discrepancies result in more negative emotion and more behavior change. The addition of tightness of control allows the understanding of the nuances of discrepancy.

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APPENDIX: SURVEY INSTRUMENTS

Survey 1. The first survey was made available to participants during the second week of their course and was active for two weeks to allow sufficient time for participation. This survey asked participants to report their identity standard meanings along the dimension of academic responsibility and the various ways they see themselves as a student (variance in identity meanings).

Student Identity Meanings and Variance of Identity

Think about yourself as a college student.
How Studious Are You?

Pick the column that best describes you and click on "10"
Next pick any columns that do not at all describe you and click on "0"
For the remaining columns, click on the number
that represents your reaction (at the left) to the descriptions at the top.

		Extremely Studious	Very Studious	Quite Studious	Somewhat Studious	A Little Studious	Not Very Studious	Not At all Studious
10	Perfectly Describes Me	10 ○	10 ○	10 ○	10 ○	10 ○	10 ○	10 ○
9		9 ○	9 ○	9 ○	9 ○	9 ○	9 ○	9 ○
8	Describes me very well	8 ○	8 ○	8 ○	8 ○	8 ○	8 ○	8 ○
7		7 ○	7 ○	7 ○	7 ○	7 ○	7 ○	7 ○
6	Pretty close description of me	6 ○	6 ○	6 ○	6 ○	6 ○	6 ○	6 ○
5		5 ○	5 ○	5 ○	5 ○	5 ○	5 ○	5 ○
4	An OK description of me	4 ○	4 ○	4 ○	4 ○	4 ○	4 ○	4 ○
3		3 ○	3 ○	3 ○	3 ○	3 ○	3 ○	3 ○
2	A poor description of me	2 ○	2 ○	2 ○	2 ○	2 ○	2 ○	2 ○
1		1 ○	1 ○	1 ○	1 ○	1 ○	1 ○	1 ○
0	Does not describe me at all	0 ○	0 ○	0 ○	0 ○	0 ○	0 ○	0 ○

Before Clicking the Submit button,
be sure you have one column at 10,
one or more columns at zero, and the rest of the columns in between 0 and 10

Submit Reset

Above measure administered for: studious, ambitious, motivated, dedicated, hardworking, and responsible.

Reflected Appraisals
Now think about your friends who are college students.
For each of the student attributes at the left, please indicate how you think your student friends would rate you?
How do you think your student friends would rate you as a college student?

Student Attribute	Extremely	Very	Quite	Somewhat	A Little	Not Very	Not at all
1. Studious							
2. Ambitious							
3. Motivated							
4. Dedicated							
5. Hardworking							
6. Responsible							

Above measure also asked for parents.

Background Information

Please indicate your age:

Please indicate your sex:

Female
Male

What is your current class standing?

Freshman
Sophomore
Junior
Senior
5th year Senior
Graduate Student
Other (please fill in)

Which category best describes your parent's income last year?

Less than $10,000
$10,000-$14,999
$15,000-$24,999
$25,000-$34,999
$35,000-$49,999
$50,000-$74,999
$75,000-$99,999
More than $100,000

What is the highest grade in school your mother completed?

What is the highest grade in school your father completed?

No formal education
Some grade school
Completed grade school
Some junior high or middle school
Completed junior high or middle school
Some high school
Completed high school
Some college
Completed 2-year college
Completed 4-year college
Some graduate work
Graduate degree

Are you employed? Yes/No

If yes, how many hours per week do you work on average?

5 and under
6-10
11-20
21-40
over 40

With which racial/ethnic group do you identify with?

White non-Hispanic/Caucasian
African American or Black
Hispanic
Asian
American Indian or Native American
Pacific Islander or Alaskan Native
Multi-racial
Other (please fill in)

Survey 2. The second survey became available after class on the date of the first mid-term exam. This survey asked participants to report the grade they think they earned on the exam and asked about their study habits in preparing for this exam. This survey was available for one week to allow sufficient time to answer the survey.

Potential Exam Grade

You recently took an exam in your Geology XXX course. The following questions are in reference to that exam.

What grade do you think you will earn on this exam?

A+ A A- B+ B B- C+ C C- D+ D D- F

What steps did you take in studying for the exam?

I attended my TA's office hours
I attended my professor's office hours
I reviewed the study guide
I reviewed my notes
I reviewed the lecture slides
I studied with a friend(s) or classmate(s)
Other: (fill in)
Other: (fill in)
Other: (fill in)

Student Identity Meanings After Mid-term Exam

Please select the position that best represents how you see yourself as a college student:

Student Attribute	Extremely	Very	Quite	Somewhat	A Little	Not Very	Not at all
1. Studious							
2. Ambitious							
3. Motivated							
4. Dedicated							
5. Hardworking							
6. Responsible							

Survey 3. The final survey was available the same day mid-term exam grades were made available to students via the course website. Participants were instructed to look at their grade on the exam before answering the final survey. This survey was available for one week. Participants were asked to report their actual grade on the mid-term exam, how they felt about it, how they would rate themselves as students, how they think others would rate them as students, and how they would prepare for the next mid-term exam in the course. Their second mid-term exam was scheduled for a week after receiving grades on the first mid-term.

Actual Grade on Exam

You recently received a grade an exam in your Geology XXX course. The following questions are in reference to that exam.

What grade did you receive on the exam?

A+ A A- B+ B B- C+ C C- D+ D D- F

Emotion

When you received your grade on the exam, how did you feel?

Please select the intensity to which you felt each of the following emotions:

Emotion	0 Not at All	1	2	3	4	5	6	7	8	9	10 Very Intense
Anger											
Sadness											
Fear											
Happiness											
Guilt											
Shame											
Anxiety											
Surprise											
Joy											
Disappointment											
Satisfaction											
Embarrassment											
Hostility											
Rage											
Displeasure											
Discomfort											
Relief											
Pride											
Annoyance											

Future Study Behavior

What do you plan to do to prepare for the next exam? (Check all that apply)

I will attend my TA's office hours
I will attend my professor's office hours
I will review the study guide
I will review my notes
I will review the lecture slides
I will study with a friend(s) or classmate(s)
Other: (fill in)
Other: (fill in)
Other: (fill in)

Reflected Appraisals

If your student friends found out about this grade, how do you think your college student friends would evaluate you as a student?

Student Attribute	Extremely	Very	Quite	Somewhat	A Little	Not Very	Not at all
1. Studious							
2. Ambitious							
3. Motivated							
4. Dedicated							
5. Hardworking							
6. Responsible							

If your parents found out about this grade, how do you think your parents would evaluate you as a student?

Student Attribute	Extremely	Very	Quite	Somewhat	A Little	Not Very	Not at all
1. Studious							
2. Ambitious							
3. Motivated							
4. Dedicated							
5. Hardworking							
6. Responsible							

Self-Appraisal

Please select the position that best represents how you see yourself as a college student:

Student Attribute	Extremely	Very	Quite	Somewhat	A Little	Not Very	Not at all
1. Studious							
2. Ambitious							
3. Motivated							
4. Dedicated							
5. Hardworking							
6. Responsible							