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Editorial

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Pokémon Go Warnings: Will they Work?

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Over the past few months, we have witnessed a number of tragedies that could potentially have been prevented. These include the alligator attack on a 2-year old boy at Disney and the shooting of Harambe the Gorilla at the Cincinnati Zoo when a child made his way into the exhibit area. Perhaps, better and more salient warning signs would have made a difference. Recently, there has been a game sweeping the nation called Pokémon Go. The players use global positioning system (GPS) devices to locate these virtual creatures in real-life areas. Consequently, some players are so engrossed in the game that they forget their surroundings. Hence, people have been known to cross streets without looking, wound up in desolate or potentially dangerous areas at night, or even cause traffic congestion. All of these incidents may lead to serious accidents. Although it is equivocal as to whether the manufacturer of Pokémon Go is legally responsible for the accidents and harm to those who play, nevertheless, it appears that new warnings are accompanying the game.[1] Based on the article by Heldman,[1] these warnings include "*Remember to be alert at all times, stay aware of your surroundings*"; "*Do not enter dangerous areas while playing Pokémon Go"*; *"Do not play Pokémon Go while driving*"; "*Do not trespass while playing Pokémon Go*." After each warning is presented, the user clicks on the OK button to reveal the next warning. After all warnings have been acknowledged, then the user may proceed with the game. However, the question is will these warnings really be effective? There are a number of studies reporting that the presence of a warning leads to greater behavioral compliance than not having one.[2-6] In my humble opinion, if a warning can save even one life, then it was well worth the time, effort, and money to construct one. Therefore, what should it take to have an effective warning? In this brief editorial, I will not be able to entertain every facet of a warning. However, I do want to quickly address a handful of variables that may lead to salience and ultimate compliance. These variables include signal words, color, and icons.

SIGNAL WORDS

The American National Standards Institute (ANSI) Z535.4[7] recommended three signal words (DANGER, WARNING. and CAUTION) for indicating potential hazards. DANGER indicates a hazardous situation that will result in death or injury. WARNING indicates a potentially hazardous situation that could result in death or injury. CAUTION indicates a potentially hazardous situation that could result in minor or moderate injury. Hence, DANGER conveyed the greatest perceived hazard value as compared to WARNING and CAUTION.[8,9] In general, results suggest that there is no statistically significant difference in perceived hazard between WARNING and CAUTION.[8,9] However, according to Merriam-Webster,[10] WARNING is "*something that tells someone about possible danger or trouble*" whereas CAUTION is defined as "*care taken to avoid danger in risk*; *a careful attitude or way of behaving; a warning telling someone to be careful*". Although one would expect that there would be statistically significant differences in perceived hazard level given the ANSI definitions, it seems more plausible that individuals interpret WARNING and CAUTION in a similar manner given their dictionary definitions.

These three signal words may be overused or are placed in situations that may not warrant them. For example, "WARNING: Do not download copyrighted material without express written permission". In accordance with the ANSI standards, there would be no physical injury associated with violating copyright. Moreover, how often have you driven through a potential

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construction site with the sign: "WARNING: Flagman Ahead", and there is neither a flagman nor construction? Hence, we tend to habituate to these signal words. Therefore, Wogalter and Silver[8] initially examined a group of 84 potential signal words based on understandability. The field was eventually dropped to 20 which had "adequate" understandability ratings yet ranged a wide gamut of perceived hazard. For example, DEADLY, FATAL, and POISON were at the top of the perceived hazard level; URGENT, BEWARE, and WARNING, were in the middle; whereas NEEDED, NOTICE, and NOTE were at the bottom. Many of these words have been tested across a number of different populations (e.g., children, college-students, non-native English speakers), and there have been relatively similar results concerning understandability and perceived hazard levels.[9] When dealing with developmentally disabled individuals, Silver et al[11] recommended using words such as NO, DON'T, and WARNING as they had high understandability ratings.

COLOR

Colors connote a certain type of hazard. For example, if we examine the color of traffic lights, red indicates stop, yellow means approach with caution, and green connotes proceed safely. Similarly, Westinghouse[12] paired the signal words DANGER, WARNING, and CAUTION with the colors red, orange, and yellow, respectively. The ANSI Z535.1[13] provided a similar standard but also added blue and green to convey safety information and safe conditions, respectively. The International Organization for Standards (ISO)[14] also published similar guidelines, but with subtle differences compared to the ANSI Z535.1 standards. Therefore, the standards provide a hierarchy of connoted hazard level with the respective color.

Indeed, in terms of perceived hazard, Braun and Silver[15] found that red and orange had a higher perceived hazard level than black, green, or blue. Although red was significantly higher than orange, there was no statistically significant difference among black, green, or blue with regard to perceived hazard level. There has been a bit of equivocal literature concerning black and red with regard to perceived hazard level. For example, Silver et al[16,17] found that black was rated higher in perceived hazard as compared to red.

With regard to behavioral compliance, Wogalter et al[6] demonstrated that a chromatic warning led to greater behavioral compliance of a non-potable drinking water fountain sign than an achromatic one. Likewise, Wogalter et al[18] found that red and yellow fonts led to fewer errors for connecting car battery jumper cables than an achromatic warning.

INTERACTION WITH SIGNAL WORD

Many of the independent variables that are associated with warnings are not necessarily independent. That is, there are interactions among them. For example, Adams and Edworthy[19] demonstrated an interaction between signal word and color, font size, and border width with regard to perceived hazard. Likewise, Braun and Silver[15] reported a statistically significant interaction between signal word and color. Participants rated 21 words across 5 colors in terms of perceived hazard. For example, DANGER printed in blue had a similar perceived hazard level as STOP written in orange or NOTICE printed in red. Moreover, DEADLY written in blue had a similar perceived hazard rating as CAREFUL printed in red. These results indicate that a high level hazard word (DEADLY) printed in a lower level hazard color (blue) will have a similar perceived hazard level to CAREFUL (low to mid-level hazard word) written in red (high perceived hazard level). In short, there is an averaging effect of perceived hazard. Finally, Silver et al[16] found a three-way interaction among signal word, color, and product type with regard to perceived hazard. In sum, these results suggest that there should be congruency among signal word, color, and product with regard to perceived hazard. That is, DANGER should be written in red on a chain saw as all three variables would normally have a high perceived hazard. However, if there is an incongruency such as CAREFUL (low to mid-level hazard) written in green (low hazard) on a muriatic acid bottle (mid- to high level hazard), then this would probably lower the overall perceived hazard level of muriatic acid, thereby potentially leading to lesser compliance. Hence, signal words printed in color can increase salience, offer a solid connoted level of perceived hazard (especially if congruent), and potentially increase behavioral compliance. However, another way to enhance noticeability and behavioral compliance is to include icons on warnings.

ICONS

Of course, we have all heard the adage a picture is worth a thousand words. The ANSI Z535.3[20] standards indicate that for a symbol or icon to be acceptable, it must be comprehended by at least 85% of the sample with no more than 5% critical confusion errors. A critical confusion error is one that can lead to a misinterpretation of the icon.[21] For example, if there is a slash through a hand, which is a standard symbol indicating "do not enter", and then it is conceivable that an interpretation could be "do not touch".

One way to try and avoid critical confusion errors is to make sure that the icons are more concrete rather than abstract in

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their interpretation. A concrete or representational symbol is one that depicts an easily recognizable object.[22] For example, if one is shown a picture of an ear (e.g., medication for the ear), then this would be considered a concrete symbol. An abstract symbol, on the other hand, has a less direct relation to the concept.[22] For example; a pharmaceutical symbol of a person with waves surrounding the head indicates that the medication would be taken for anxiety. Arbitrary symbols have no relation to the concept at hand.[22] For example, an international traffic sign depicting a plain white circle contained within a brown bordered circle would indicate "no vehicles allowed". In this case, it might be more prudent to show vehicles and put a diagonal slash through them. In general, concrete symbols are comprehended better than abstract or arbitrary ones.[23]

An icon by itself may provide salience,[24] but given the potential critical confusion errors, it would be more logical to pair it with congruent text. The text could include a signal word and a brief message stating what one should not do and the consequences thereof for performing that particular behavior. It has been shown that icons may facilitate greater behavioral compliance than simple text alone.[25] However, with regard to medication schedules; there may be no statistically significant difference in comprehension and memory.[26] Nevertheless, in order to develop a reasonable warning, a concrete icon (preferably) should be included to enhance salience and potential behavioral compliance. Therefore, given these variables, will the new Pokémon warnings work?

CONCLUSIONS

Although warnings may enhance compliance as compared to no warnings,[2-6] the question becomes one of adequacy. Given the Pokémon Go warnings as mentioned by Heldman,[1] there are neither signal words nor icons. The warning itself should not be written in a safety color such as green given that there is a potential hazard. Moreover, the warning simply states what not to do rather than what the potential consequences may be for doing so. Perhaps constructing a warning with a signal word such as "DANGER" written in red or orange (Helvetica type) coupled with an icon within a circular border depicting someone playing Pokémon Go on their phone with a diagonal slash (from top right to bottom left) through the icon indicating a prohibited action along with the verbiage written in black on a white background (to increase legibility) would be more logical in attempting to increase salience and possibly prevent accidents. Of course, all these should be in a reasonably large font size in order to increase salience.

My belief, however, is that given these new warnings as shown in Heldman,[1] the vast majority of individuals will hit the OK button four times without reading (or processing) the quick message in order to obtain the reinforcement of playing the game. Therefore, it is equivocal to this author what the major advantages are for these types of warnings. Thus, with the type of warning proposed here, it is certainly conceivable that the majority of users might continue to hit OK many times in order to reach the actual game. However, it is just as or more likely that this warning might attract the user's attention which would allow them to read and digest the information. This might lead to greater compliance and hopefully result in fewer dangerous situations, accidents, and mishaps.

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Review

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The Anger-Aggression Bidirectional-Causation (AABC) Model's Relevance for Dyadic Violence, Revenge and Catharsis

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I. ABSTRACT

In this article, the multifaceted theoretical underpinnings of V. J. Konečni's Anger-Aggression Bidirectional-Causation (AABC) model of interpersonal aggression are described, along with a large body of supporting data, mostly from laboratory experiments. The AABC model's utility in the clarification of several complex issues of long standing in various scholarly domains is discussed, such as: Catharsis and the "cathartic effect"; adaptationist accounts of revenge; and intrafamilial dyadic violence.

II. KEYWORDS: Anger; Aggression; Revenge; Anger-Aggression Bidirectional-Causation Model; AABC Model; Catharsis; Cathartic effect; Dyadic violence.

III. ABBREVIATIONS: AABC: Anger-Aggression Bidirectional-Causation; PEEM: Prototypical Emotion-Episode Model; IO: Initial Offender; RP: Research Participant; IRB: Institutional Review Board; UCSD: University of California, San Diego.

IV. INTRODUCTION

In a recent article on family violence, Finkenauer et al[1] invoked a host of distal factors (societal, structural, personality), but failed to address a frequent and potentially crucial proximal cause – the *dyadic aggression sequence* – of which the main components are provocation, anger, and retaliation. A detailed analysis of the aggression sequence, including the behavioral and physiological *consequences of revenge*, was, for perhaps understandable reasons, also missing in the recent adaptationist discussion of the revenge and forgiveness systems by McCullough, et al.[2] Yet the culmination of numerous aggression-related exchanges between members of a dyad (consisting of a couple, parent and offspring, and other relations), repeated over protracted time periods, may be the particularly deleterious *anger-free preemptive strikes*. The ingredients of an aggression series, its specific content and form, may be at the core of intrafamilial violence and offer insights regarding the possibilities of treatment tailored for dyads.

One purpose of this article is to review the evidence for the arguably key aspect of an aggression sequence, the "cathartic effect" (defined below), within Konečni's[3-5] Anger-Aggression Bidirectional-Causation or (AABC) model. The second purpose is to contribute to, and hopefully extend, the systemic and the adaptationist accounts of provocation, revenge, and their roles in the dynamics of dyadic intrafamilial violence.

V. THE RELEVANT ASPECTS OF INTERPERSONAL AGGRESSION

The type of aggressive behavior with which this article is concerned is interpersonal, face-to-face, infliction of harm (or as close to that as one can come in laboratory settings), preceded by a pronounced emotional state, anger. One must immediately acknowledge that anger is largely absent in many instances of human aggression (e.g., someone's initiation into a street gang by violence; a pilot's bombardment of civilian targets from five kilometers), and this "instrumental," arguably cold-blooded, violence is not the subject of inquiry here. De-

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spite the superficial similarity, such aggressive activity must be distinguished from the anger-free preemptive strikes, mentioned above, a condition to which a dyad arrives only after a prior series of "hot-blooded" exchanges. Most of the author's experimental work to which reference will be made has involved the (alleged) infliction of physical harm and he has clearly distinguished,[3,4] on empirical and theoretical grounds, among physical aggression, verbal aggression, play and fantasy aggression, the mere observation of aggressive activity, and so on.[6-10]

VI.THE RELEVANT ASPECTS OF ANGER AND *PEEM*

Anger is a pronounced, and reliably reportable and observable, emotional state with numerous antecedents, concomitants, and consequences.[11-16] In the present author's experimental work and theoretical writing, anger has been viewed in the context of his Prototypical Emotion-Episode Model, or (PEEM) [Figure 1, p. 117].[17] PEEM is concerned with the following events and processes, among others: Normative and attributive evaluation, and comprehension of the initial event (for example, an insult – a prototypical "ego-thwarting," socially inflicted, aversive stimulus); facial and postural cues; the fluctuations of (sympathetic) physiological arousal; and the monitoring of various internal cues, and the integration of these with the external-event cues ("emotion-labeling").

Although the experimental demonstrations by Schachter and Singer[18] have been sharply criticized,[19,20] Schachter's core theoretical ("two-factor") proposal[21] has not been seriously challenged – that once an emotion has been identified ("labeled") by the experiencing person, the level of arousal largely governs the intensity of the emotion. Furthermore, once a person has been, for example, insulted, a further increment in arousal, which is soon afterwards induced by other, neutral, means, such as loud and complex music,[16] or physical exercise,[22,23] contributes in an *additive* manner to the overall anger, even though by themselves these neutral events are not anger-inducing. When, however, physical exercise precedes the insulting event, its arousingness contributes far less to the degree of subsequent anger.[23] Finally, due to the homeostatic regulation of arousal fluctuations, the level of arousal and the degree of anger predictably decrease with the passage of time.[3,24,25]

With regard to the emotion-identification (emotion labeling) issue, PEEM specifies a set of cognitive operations that are necessary for a person to infer, with confidence, that he or she is experiencing a pronounced, phenomenologically distinct, emotional state, such as anger or fear or joy.[16] The operations in question are *monitoring, interpretation,* and *integration* of information. Furthermore, there are two sequential interpretation components of PEEM. In the first, the information in the external event is analyzed, especially in terms of attribution theory.[26] Does the event have a natural or man-made origin? If man-made, is it accidental or intentional? If intentional, is it normative or counter-normative? And, in the case of anger, are someone's words a well-intentioned joke or an insult? Who is "someone" responsible for the insult? From an adult's viewpoint, is the speaker a 12-year-old boy or a powerful superior – so, anger or fear? From a 12-year-old boy's angle, does the insult come from his younger brother or his father? In short, the emotional-label inference depends on "causal assignment" or "causal explanation".[27] The second distinct occurrence of interpretation is concerned with the monitored internal events – interoceptive feedback regarding arousal fluctuations; proprioceptive feedback from the facial musculature[28]; and postural cues – all of which are integrated in arriving at emotional identification or label.

An important aspect of PEEM is *recursiveness*, a feature that is meant, among other issues, to handle successive reinterpretations of the external event as it changes or develops. Words that are interpreted as insulting and lead to anger may be quickly followed by a disarming apology or clarification by the speaker, which would make anger be relabeled to, for example, mirth and cause arousal to dissipate very quickly. Also, the developing external event may demand urgent action, so that what begins as a mixed emotion, for instance, of anger and fear, is reinterpreted as one – the dominant alternative.

VII. CATHARSIS AND THE "CATHARTIC EFFECT"

Both of these concepts have been discussed in detail by the author in various articles.[3-5,15,29] Catharsis, especially in its "hydraulic" form, has been severely criticized from various perspectives[30] and flagrantly misused in self-help manuals. With reference to experimentation, one of the most serious and frequent conceptual errors committed by researchers has been to regard the various substitute-target and vicarious aggressive activities as functionally equivalent to the infliction of physical injury – indeed, to regard them as "aggressive" (or "cathartic") at all.

The present author has attempted to avoid the mentioned conceptual pitfalls and has defined the "cathartic effect" as simply an empirically observable fact: When genuinely angry persons are given the opportunity to hurt (allegedly) the individual who insulted them, the amount of their subsequent (residual) aggression toward the same person is sharply reduced in comparison to persons who did not have the opportunity to retaliate – in fact, reduced to the level displayed by those who were not insulted at all beforehand.[3] These clear and replicable findings, and the underlying theoretical assumptions, have been incorporated in the AABC model.

Despite such findings, and warnings to the effect that definitions should be made explicit and concepts transparent when carrying out catharsis-related research, there have been subsequent experiments characterized by inadequate experimental procedures that largely tested straw versions of "catharsis".[31-33] Such studies were recently criticized by Konečni,[34] not only on methodological and conceptual grounds, but also with regard to their backdrop, colored by political and socio-cultural bias.

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VIII. THE AABC MODEL: ASSUMPTIONS, PROVISOS, RESEARCH PARADIGM, PREDICTIONS

The AABC model of interpersonal aggression was formulated only in 2012 by the author,[5] but a detailed survey was published already in 1984[4] of a very large body of relevant field and, especially, laboratory work by numerous investigators, including the author. The model is chiefly concerned with the various antecedents (especially anger) and consequences of face-to-face infliction of injury.

The two-way causal link (bidirectional causation) between the degree of anger and the amount of aggressive behavior that is performed refers to two related propositions. The first is that the higher the degree of anger, the greater the amount of aggression that will ensue, *all else equal*. The second is that aggressive actions performed by angry individuals against the human cause of their anger reduces, *all else equal*, their degree of felt anger, by virtue of eliminating or subduing the noxious external stimuli and thus decreasing the physiological justification for the angry state. The theory-imposed qualifications of this second proposition, the reverse causal link, are that a person's aggressive acts may reduce his or her anger (which is hypothetically mediated by the level of physiological arousal being lowered) provided that these acts: (a) are preceded by anger; (b) have the (human) source or instigator of anger as the target; (c) inflict harm to the target (or at least appear to the aggressor to do so), and (d) are not immediately followed by a further induction of anger, retaliation, or other aversive events. We shall return to these provisos in Section IX.5.

In the author's laboratory, the most relevant data were obtained by means of a three-stage research paradigm.[3,5] In a typical stage 1, the Initial Offender (IO) (that is, the experimenter's well-trained "accomplice", who would next himself or herself become the target), insults, in a standardized manner, the unsuspecting Research Participant (RP). In stage 2 (the "revenge" period), by following instructions on a bogus task, RP retaliates against IO, for example, by administering to this person a fixed number of (fictitious) electric shocks ("painful, but not causing injury"). Finally, in stage 3, RP's willingness to engage in *additional* ("residual") behavioral aggression against IO is measured by means of a specially designed pseudo-creativity test. In these experiments, there were numerous control conditions for all three research stages. For instance, in stage 1, there was the condition of RP being anger-free. In stage 2, the type and duration of interpolated activity were varied, such as aggression against a substitute target ("scapegoat") and mathematical tasks to minimize rumination. Finally, in stage 3, RP's residual aggression was measured when directed at substitute targets. In addition to the main dependent measure, which was RP's residual aggression toward IO, measurements of physiological arousal (blood pressure, heart rate, galvanic skin response, etc.) and a variety of verbal ratings were obtained in a methodologically careful manner, avoiding order and sequence effects, and other confoundings.

IX. THE AABC MODEL: EXPERIMENTAL FINDINGS

A convincing amount of experimental support has been obtained in various laboratories for all components of the AABC model.

1. That noxious social stimulation, both of the insult ("ego threat") and "blocked goal" kinds, results in statistically significant increases in systolic blood pressure and heart rate, has been amply demonstrated, for instance, by Hokanson and his colleagues,[35-37] and also by the present author in his extensive pilot (procedure pretesting) studies leading to various behavioral aggression experiments. In all of these and numerous other studies, noxious instigations also resulted in RPs' significantly more intense anger (as measured by self-ratings, in interviews, and observationally).

2. RPs who had been made angry by insults or capriciously blocked goals in carefully rigged experimental situations subsequently physically aggressed significantly more against IOs – in terms of "shocks" or "blasts of noise" – than did non-angered control RPs.[3,4,15,16,29]

3. After the angered RPs had physically retaliated against IO, they subsequently displayed significantly less behavioral aggression against IO than did the equally angered RPs without the prior retaliation experience.[3,4,15,38] This basic, experimentally demonstrated, cathartic effect was anticipated by Plato some 2,400 years ago: "If one man is angry with another, he can take it out of him on the spot, and will be less likely to pursue the quarrel further" [Book V, p. 222].[39] In fact, the amount of residual aggression in the principal experimental group (insulted retaliators) in Konečni's experiments was, on the average, no greater than that in the nonangered control group.[3,15] Significantly, as predicted by the AABC model, all of the above results were paralleled by those in terms of psychophysiological measures in other experiments.[35-37] In addition, certain correct predictions could be made only on the basis of the cathartic effect within the AABC model – for instance, regarding alcohol intake and music choice. Insulted RPs, who had had the opportunity to retaliate, consumed significantly less alcohol than did the equally insulted ones without the retaliation opportunity.[40] Also, as predicted, whereas insulted RPs who had had a retaliation opportunity later behaved like the controls and chose simple and complex auditory stimuli equally often, insulted RPs without a retaliation opportunity shunned complex auditory stimulation.[41,42]

4. Although there are data showing that angered RPs' aggression against a person *unrelated* to IO ("scapegoat") reduces their subsequent aggression against IO,[15,43] such "displaced" aggression, which obviously cannot be considered a genuine *retaliatory* act, has a much weaker effect at the group mean level than does retaliation against IO in the interpolated period (stage 2).

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In addition, angered RPs' displaced aggression against a person unrelated to IO did not reduce their systolic blood pressure in one study.[43] In another experiment, aggression against IO's declared "assistant" resulted in blood pressure readings that were halfway between those for the direct-aggression group and the no-aggression control, but this displaced-aggression effect was not statistically significant.[37]

5. As for the findings that address the second proposition (reverse causal link) of the AABC model (Section VIII), the following ones are relevant: (a) when aggressive actions in stage 2 are *not preceded by anger* (stage 1), participants' subsequent aggression in stage 3 is *not decreased* in comparison to controls without a prior aggression experience;[3,10,15,23,38] this is in line with the theory – emotion-free aggression is likely to lead to *more* aggression; (b) there is, for all practical purposes, no support in the literature for the notion that angered persons' "aggression" against inanimate targets reduces their subsequent arousal, anger, or aggression; when the target of aggression is a human other than the anger instigator, the cathartic effect is behaviorally weak and physiologically non-existent[15,37,43]; (c) one experiment, in which participants' beliefs were manipulated about the probability (0.9, 0.5, or 0.1) that IO would receive the (alleged) shocks they were "administering", decisively demonstrated that the cathartic effect depended, in a manner that was predicted by the AABC model, on harm actually being inflicted by RPs' actions[44]; and (d) there are insurmountable logistical difficulties in attempting to study in the laboratory any anger induction, revenge, and other aversive evens befalling the participants *beyond* the already very complex three-stage design; however, a discussion of the sequence of aggressive actions in dyads will be resumed later.

X. WHY IS AGGRESSION EXCEPTIONALLY EFFECTIVE IN REDUCING ANGER?

It is a truism that social aversive events (i.e., aversive events caused by other people) often have a profound effect on the person exposed to them, especially if others' actions are perceived as capricious or arbitrary[27] and performed with the intent of inflicting physical, economic, or psychological harm. One immediate and important consequence of such events is a dramatic increase in the level of arousal, frequently labeled as anger – a consequence that is particularly well documented, as we have seen, in the case of humiliating behavior and insults. The insult-induced elevation of arousal (which is in itself demonstrably aversive) is likely to persist for the duration of noxious stimulation. Once insults have ceased or their source has been otherwise removed from the proximity of their target, the latter's arousal level – as was mentioned earlier – gradually subsides toward the baseline, barring additional aversive events or rumination-induced arousal-level increases. It is maladaptive for arousal level to remain excessively high for long periods after the noxious stimulation has ceased and it is self-evident that most people exposed to verbal abuse would be highly motivated to bring about as quick as possible a termination of such an event. It is also self-evident that actions that are successful in terminating external noxious stimulation are followed, closely in time, by the onset of homeostatic arousal-decay processes.

Laboratory experiments have shown that physical retaliation toward IO is significantly more successful in reducing RPs' arousal, anger, and subsequent aggression in comparison with participants' involvement in distracting arithmetic tasks, their exposure to neutral auditory stimuli, and with waiting idly for a period of time.[3,15,16,38] The reason for such effectiveness of aggression may lie in the prevailing real-life contingencies that favor the performance of aggressive over non-aggressive responses in many noxious situations, presumably especially in cases in which the stimulation-induced arousal is labeled anger by the target of the stimulation (as opposed to, for example, fear). There is, for instance, a substantial body of evidence obtained through systematic observation in naturalistic settings, such as playgrounds, which shows that acts of revenge (justified aggression) may be very efficient in ending others' – such as playground bullies' – attacks.[45,46]

It is true that there have been experiments suggesting that non-aggressive ("friendly" and even "self-punitive") responses to noxious social stimulation may lead to a decrease in arousal level.[47,48] However, this work merely demonstrates that certain non-aggressive responses *can be conditioned* to decrease the level of arousal when it is arranged, in the laboratory, that they reliably lead to threat removal. Such findings are not informative about the comparative utility of non-aggressive *versus* aggressive responses to noxious stimulation in the world outside the laboratory. One must remember that in the studies discussed earlier, angered participants' aggressive actions reduced their arousal level without any conditioning in the laboratory. In other words, RPs came to the laboratory with the arousal-decreasing property of their anger-induced aggressive actions already established, presumably in the course of their history of exposure to real-life contingencies involving noxious stimulation, aggression, and so on.

Note that nothing in the present analysis implies either that there is an inherent relationship between aggression and arousal, or that the link between aggressive behavior and autonomic changes is established by some unique process. Rather, it is merely suggested that to the extent that aggressive responses differ from the non-aggressive ones in terms of their ability to decrease arousal level, this difference may be due to the former responses' superiority in eliminating noxious stimulation in interpersonal situations.

XI. DELETERIOUS LONG-TERM EFFECTS

From a broader interpersonal, societal, and even legal perspective, the news is certainly unwelcome that aggressive retaliation is an angry person's most effective response to

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a provocation – in that it rapidly decreases both the aversively high level of arousal, and the emotionally and physiologically taxing degree of anger. The fact that the immediate likely result is also a reduction of the probability and intensity of this person's additional aggression – in that setting and at that time – is of little consolation, given that it is vengeful *aggression* that brought about the interpersonal equilibrium and relative quiescence. However, as the author recently wrote elsewhere (in his,[34] regarding[31-33]), "a scientific discovery of even a disagreeable fact about human behavior or nature – made by a sound methodology and in good faith, and published in first-tier journals – does not entitle [others] to pretend, ostrich-like or capriciously, that the demonstrated fact does not exist."

That such a stance is an unacceptable social and "culturological" option becomes even more obvious when one considers the long-term implications of the cathartic effect. "Unwelcome news" of the effectiveness of revenge, when provoked (including the physical variety), become "very bad news" in the long term, especially in intrafamilial dyads. The reason is to be found in the features of the cathartic effect that have been demonstrated by research and that have implications for the dyadic, especially intrafamilial, aggression sequences.

Here is what the present author wrote in 1975 [p. 100][3]: "Several aspects of the present results suggest that it is likely, in the long run, that aggression breeds aggression. This may be so in spite of, or perhaps partly because of, the cathartic effect. First, if real-life contingencies favor aggressive over non-aggressive responses in anger-inducing noxious situations, and if the former are superior in decreasing the level of arousal (labeled anger) from an aversively high level, it follows that every instance in which aggression alleviates anger increases the probability that aggression will occur in future cases of anger inducement. Second, even in experimental conditions in which angered people's expression of aggression reduced the level of subsequent aggression, these subjects [research participants] evaluated the annoyer [IO] very negatively at the end of the experiment."

Konečni then mentioned that such an outcome was anticipated by Buss [p. 13][49] when the latter wrote: "*After the anger subsides, there remain negative language responses, consisting of resentment, [and] belief that others are threatening*." Konečni continued: "This evaluative bad aftertaste may easily later lead to anger (and aggression) through the self-arousal mechanism. Third, if aggression is associated often enough in a person's life history with the elimination of others' aggression and the reduction of anger, it is likely that his [or her] aggressive responses will come to be elicited by the progressively weaker anger-inducing stimulation. An ever lower level of anger may accompany successive instances of aggression, where these instances are removed in time from each other."

Konečni then referred to an experimental condition in one of his experiments[3]: "[The above is] suggested by the interpretation of the annoyed 13-min shock cell [one of the conditions in the interpolated period, stage 2]... in terms of the many-punishments standard adopted by subjects [RPs] who presumably delivered the majority of interpolated punishments in *the virtual absence of anger* [italics added]. A person who performs aggressive acts in anticipation of the onset of anger may adopt a similar standard. This seems particularly likely in the case of a prolonged dyadic interaction with a well-defined status and power structure, such as that between parent and child. Fixed behavioral sequences often characterize such relationships, and aggressive responses, if performed, are likely to be in the same mode. Aggression may then become the routine treatment, devoid of anger and other emotions and needing hardly any provocation."

This is precisely what was meant by "preemptive strikes" at the beginning of the present article, and of what scholars concentrating on the effects of distal factors in family violence,[1] and those interested in adaptationist accounts of revenge,[2] need to take serious cognizance: Aggression that is no longer "angry" or vengeful but cold-blooded and callously preemptive.

XII. GENERALITY AND UTILITY OF THE AABC MODEL

The AABC model of anger-induced interpersonal aggression and its consequences appears to have a considerable scope. It places the link between anger and aggression in a broad emotional and motivational context, and makes it possible to integrate a large body of data within a unified theoretical framework, relating this area of research to several diverse theoretical and empirical developments. Even a cursory examination of the implications of the various details of the proposed two-way causal link between anger and aggression can illustrate the model's utility as an integrative, heuristic, and predictive tool.

An important part of the model is concerned with antecedents of anger and its effects on aggressive behavior (Section VI.). The model's emphasis on anger has the function of explicitly bringing the theoretical developments in the area of emotion (such as PEEM) to bear on aggression phenomena and makes it possible that predictions be made about the (indirect) effect on aggressive behavior of a large number of factors that influence either (a) arousal level, or (b) facial expression, or (c) the cognitive-interpretive processes – because arousal, proprioceptive feedback from the facial musculature, and cognitive labeling are all considered to be important influences on the degree of anger. As a result, many isolated effects and seemingly heterogeneous antecedents of aggressive behavior can be viewed within a single conceptual scheme.

With regard to the arousal component of the model, many different stimuli and procedures, such as TV violence, physical exercise, the presence of weapons, or the sight of adults hitting dolls, to mention just a few, have *arousingness* as a com-

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mon element and can lead to aggression when an appropriate emotional label is adopted. In addition, since the arousal-level fluctuations that are induced by noxious social stimulation have a lawful time-course, and can be affected by more than one factor simultaneously (usually in an additive manner), relatively precise predictions can be made about the differential amounts of aggressive behavior that would occur at different points in time following the instigation, as well as about the manner in which the amount of aggression would be affected by the number and type of initial arousal-raising manipulations and the subsequent presence, during the arousal-level "recovery," of factors that speed it up or slow it down.

The model is also able to make predictions about the effect on aggressive behavior of the facial-expression component of anger. Thus, as one example, Konečni and Zellensky[50] found that by constraining angered participants' faces into a frown during the aggression phase of the experiment, they were able to increase the amount of RPs' (fictitious) aggression; in contrast, constraining angered RPs' faces into a smile led to a decrease in the amount of aggression.

As for the cognitive-labeling component of the model, it was suggested that the anger-labeling process, and consequently the amount of aggression, would almost certainly be affected by (a) attributions concerning the anger instigator's responsibility and intent, (b) a consideration of environmental and normative constraints operating on the instigator, and (c) the extent to which the situation contains elements that may lead to a misattribution of the source of experienced arousal.

Many of the empirical questions that have traditionally been treated under the heading of catharsis (Section VII) are in the domain of the AABC model that was presented here (also see [5]). The conceptualization of the cathartic effect in the present framework may help resolve the controversy that has long surrounded this important area of research. The precise conditions necessary for the occurrence of the effect can now be specified and the various earlier failures to obtain it can be explained in terms of a relatively small set of theoretical propositions.

Finally, because arousal and affect are among the key components of the AABC model, it makes it possible to establish useful conceptual and empirical links between the work on aggression phenomena and other, seemingly unrelated, substantive areas in which arousal and affect also play a prominent role [Section IX.3], such as certain topics in empirical (psychological) aesthetics,[41,42,51,52] alcohol consumption,[40] and even intergroup conflict.[53] Such efforts are but small steps to remedy the much-criticized compartmentalization of psychology.

XIII. COMMENTS REGARDING RESEARCH PARTICIPANTS AND METHOD

The author's laboratory research on human-aggression phenomena began in 1971, when he was a doctoral student at the University of Toronto (in collaboration with Professor A. N. Doob), and continued, with him, first, as Assistant Professor, and then as Associate Professor with tenure, at the University of California, San Diego (UCSD), in the period 1973-1978. In this entire period of nine years, at two prestigious universities in two countries, there was never a complaint of any kind by a research participant to the Institutional Review Board (IRB) about their experiences and the treatment they received in the author's laboratory. It is important to realize that close to a thousand research participants, male and female, were involved, and some fifty (male and female) research assistants. The author developed lengthy and elaborate "debriefing and full-explanation with equipment-demonstration" procedures that were religiously followed by the well-trained research assistants. Not one complaint was ever filed by a participant with either a department chair or IRB.

However, by about 1979, a multifaceted new climate regarding the conduct of research with human participants began to prevail,[5,34] especially concerning the use of "deception" procedures. This shut down research programs, North-America-wide, that used realistic (but totally humane) procedures to study the essence of human aggression, and opened the door for the "as-if" and "story-scenario" approaches that are inherently weak, unrealistic, and unable to induce genuine and powerful emotional states, such as "ego-thwarted" anger. This, in turn, led to the "culturally desirable," anti-cathartic-effect, bland "findings" that have very little to do with what goes on in the real world of relationships, families, and streets.

XIV. CONCLUSION

The Anger-Aggression Bidirectional-Causation model's utility in the clarification of several complex issues of long standing in various scholarly domains has been demonstrated, especially: Catharsis and the "cathartic effect"; adaptationist accounts of revenge; and intrafamilial dyadic violence. This model of anger-induced interpersonal aggression and its consequences places the link between anger and aggression in a broad emotional and motivational context, and facilitates the integration of a large body of data. Moreover, and significantly, the formulation of the cathartic effect within the AABC framework helps explain (Section XI) its deleterious long-term consequences in dyadic relationships and as a crucial aspect of cold-blooded revenge.

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Shedding the Quantitative Imperative

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I am, unfortunately, trained in the quantitative imperative associated with pythagoreanism and adopted by scientists during the development of common scales for length, mass, temperature, and time. While interested in complex and social behaviors, I have found myself at odds within my chosen field of psychology due to what is considered a requirement of science: true quantitative measurement. My background in physics impressed upon me a different definition of measurement than what I have become accustomed to within psychology, especially within the social and cognitive subfields. The quantitative imperative holds knowledge requires measurement, and measurement of an attribute requires a discovery of continuous ratios of real numbers (i.e. $a=r*b$ where r is a unit and b is a magnitude). From this perspective, knowledge requires quantification, and quantification requires units that describe continuous scales.

In 1940, a group of physicists assembled the Ferguson Committee in order to evaluate whether or not the measurement attempts of psychometricians constituted a new field of science.[1] They did not decide in the psychometricians' favor, and the reason psychology was officially rejected as a scientific field by the greater scientific community was largely due to the quantitative imperative. Despite the modern widespread treatment of Likert or Item Response Theory scales as being quantitative, the psychometrician's measurement is not of continuous ratios of real numbers, does not use physical units, and thus departs from the historical definition of measurement that has been the scientific standard since Euclid. In order for an observation to be continuous, magnitudes of the measure must meet the required associative, commutative, transitive, and density properties, and the scale must be able to be divided into separate arbitrary upper and lower sets.[2] However, it is the density property (i.e. a scale must be infinitely divisible) that is critical for a scale to be not just additive, but also continuous. It was the density property that drew Stevens'[3] focus when he redefined measurement to be the assignment of numbers to properties according to a rule after the Ferguson Committee rejected psychology's measurement as science.

Stevens understood the importance of the density requirement of continuity and separated his nominal and ordinal scales (which were allegedly additive) from his interval and ratio scales (which were allegedly continuous) before identifying the mathematical permissibility of each of his new scales of "measurement." Psychology believed the operationalism and representationalism of Stevens' measurement allowed true quantitative measurement and developed a series of quantitative instruments and analysis methods without actually testing the hypothesis that these scales (and the actual phenomena/construct under investigation) were quantitative. Rather than test the quantitative hypothesis as was previously required within physics, psychologists and psychometricians such as Russell, Campbell, Nagel, and Stevens redefined measurement within psychology in a manner that departed from reality and tradition in favor of positivist philosophy. Doing so shifted the scrutiny of psychology's alleged quantification to permissible statistics and meaningfulness while creating a culture that has systematically over-looked the critical assumption that the constructs and measurement within psychology are quantitative. With this new definition of quantitative measurement, psychology appeared to be a science – not because the quantitative hypothesis had been tested, but because psychology claimed itself to be a quantitative science due to the use of quantitative methods of analysis. This is an obviously circular argument.

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After the Ferguson Committee, psychology was faced with two obvious options: reject the quantitative imperative, or adhere to the standards of science. Skinner chose the latter, for the measurement of inter-response times is a quantitative measure (with continuous units), and by working without proxies, radical behaviorists used no operationalism, and thus did not assume the construct under investigation to be quantitative. The radical behaviorists avoided the quantitative assumption made by the psychometricians and continued the scientific tradition of performing idemnotic rather than vaganotic measurement.[4] Unlike the radical behaviorists, the neo behaviorists and eventually cognitivists began inferring internal processes from their quantitative measurement (e.g. reaction time to infer visual attention) but did not demonstrate the internal processes were also quantitative. Using a quantitative measure to make inferences about what may likely be qualitative internal events cannot be described as consistent theory or practice; indeed, the neo behaviorists' methodological rigor had been compromised by the psychometricians' choice of the former option: to reject the quantitative imperative. However, while the psychometricians rejected the quantitative imperative by turning to measures that are obviously not additive (let alone continuous), they recognized acceptance by the greater sciences hinged on appearing to conform to the quantitative imperative.

The psychometricians selected a third, and rather damning option: to partially reject the quantitative imperative by performing false quantitative measurement, and then reaping the benefits of allegedly performing quantitative measurement. With poor measurement came poor data, and the resulting small effects required further elucidation and innovation. So began the psychometricans' development of allegedly quantitative statistical analyses which are misused and misunderstood to the point that the majority of these analyses' users cannot actually describe a *p*-value. For all its robustness, null hypothesis significance testing has coincided with a decrease in replicability to the point that over 75% of major social psychology experiments fail to replicate. *P*-values are being removed from social psychology journals[5] possibly because we are beginning to realize that fraudulent quantified measurement is not a solution to the measurement concerns of the psychometrician.

I affectionately label the cognitive dissonance related to the psychometricans' actual *versus* supposed measurement as *physics envy*; though Michell's[6] use of the term *pathology* is far more compelling. Rather than develop measurement within the tradition of physics, psychology outside of radical behaviorism created a new tradition of measurement, fell victim of equivocation, began assuming itself to be a science, pioneered a series of quantitative analyses to further appear to be a quantitative science, labeled outside criticism from the greater scientific community as conspiracy, and cemented a pathology which has systematically overlooked the fact that psychology's measurement is not continuous, additive, or quantitative. This thought disorder was likely elicited due to the quantitative imperative; rather than accept the seemingly bleak chances of quantitative measurement, it was apparently easier to redefine quantitative measurement and break away from scientific tradition.

While trained in the quantitative imperative, I now recognize that psychology (especially its social subfields) must reject the quantitative imperative and pythagoreanism. Michell[7] provides an excellent point about the philosophy of realist science; any mandate that imposes limitations on investigations should not be accepted without critical inquiry, and the quantitative imperative has narrowed our focus of knowledge solely to quantitative measurement. Science is not merely experimentation and measurement; science is also a process of critical inquiry; hence, to define an enterprise as science simply based on its measurement is inappropriate. The main difference between quantification and qualification is instrumental; qualitative data are less precise estimates of quantified information. For example, a qualitative measure such as Skinner's[8] cumulative curve did not precisely measure the amount of time between responses, but Schneider[9] eventually developed an apparatus that could precisely measure inter-response time and allowed quantification of previous qualitative measures. Thus, dismissing qualitative data may be inappropriate because this information may eventually be used to develop quantitative information.

However, quantum theory and Planck units complicate our understanding of continuity due to the density property. The density property requires a scale have a supposedly infinite number of divisions, but only measures of space-time can be classified as continuous with this criterion at the macro level. Planck units are the smallest possible value for each measure (with the exception of Kelvin which is a maximum value) before quantum effects become relevant and smaller divisions thus become meaningless. When considering Planck units, the density requirement cannot possibly be met by any measures that are generally interpreted to be continuous at the macro level. Thus, quantum theory seemingly indicates all scales should be interpreted as being discrete. Regardless of the metaphysical definitions of measurement, measurement is simply counting. We may count milliseconds, kilometers, or micrograms, but the actuality of our observations is that they occur discretely and should be treated as such.

It is my hope that more social behavior journals develop accepting cultures of qualitative data, and critically evaluate the assumptions inherent in quantitative measurement, especially when considering quantitative data analyses that depend on continuity assumptions. The quantitative imperative is archaic, and should be rejected based on quantum theory and its implications; any attempts to dress-up truly qualitative data as quantitative data introduces a flood of assumptions that affect not just the data analysis, but the implications and inferences of the analyses. It is my hope more social behavior journals develop accepting cultures of individual analyses, for Stevens was correct regarding the multiplicative permissibility of qualitative

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data used to perform group and aggregate analyses. After all, analyses based in group averages are not permissible as the density property is not met by our observations. It is my hope that more social behavior journals develop accepting cultures of alternative data analysis methods, for null hypothesis significance testing was popularized within psychology under the pressure of the quantitative imperative. With the rise of null hypothesis significance testing, we have observed a decrease in replicability, single-subject designs, and individual analyses. It is my hope that more social behavior journals develop cultures of consistent metaphysics and encourage the avoidance of hypocritical measurement and methods. Qualitative or discrete data should be analyzed appropriately; robustness of a test does not address underlying theoretical inconsistencies, and certainly is not justification for a continued denial of untested quantitative hypotheses. At the very least, it is my hope that more social behavior journals develop cultures that embrace critical inquiry over the quantitative imperative.

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Synthetic Hormone Dose in Hormonal Contraceptives Predicts Individual Differences in Personality

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ABSTRACT

The purpose of this study is to investigate whether the dose of synthetic hormones in hormonal contraceptives (HCs) is related to between-subject variation in personality. HC users reported the brand of their HC and completed the Big Five Inventory (BFI). Each woman's dose of synthetic hormones was calculated and a median split assigned women to the high or low synthetic estrogen group and the high or low synthetic progesterone group. Women taking HCs high in synthetic estrogen scored lower on extraversion and higher on neuroticism than those taking HCs relatively low in synthetic estrogen. There were no effects of synthetic progesterone level on any of the Big Five personality traits. Results suggest that synthetic estrogen in HCs may influence women's personality. Future research should investigate this possibility experimentally or using a pre-post design, and should investigate anatomical neural correlates.

KEYWORDS: Contraception; Hormones; Estrogen; Progesterone; Personality; Extraversion; Neuroticism.

ABBREVIATIONS: HCs: Hormonal contraceptives; BFI: Big Five Inventory; ANCOVA: Analysis of covariance.

INTRODUCTION

Although the physical side effects of hormonal contraceptives (HCs) are well-established,[1] researchers have only recently begun to investigate the psychological and behavioral side effects of HC use. Currently, evidence suggests that synthetic estrogen in HCs may drive changes in women's behavior. Women using HCs experience greater levels of jealousy[2] and higher use of mate retention tactics[3] than other women. This increase in jealousy and mate guarding is associated with the level of synthetic estrogen, but not the level of progestin, in HCs, with women using contraceptives higher in synthetic estrogen reporting greater jealousy and mate guarding than women using other contraceptives. Interestingly, the level of synthetic estrogen in combined HCs also positively predicts women's objectification of other women.[4] Collectively, these findings imply that synthetic estrogen administered *via* HCs changes aspects of women's behavior, which may reflect underlying changes in personality.

The Big Five personality dimensions – extraversion, agreeableness, conscientiousness, openness to experience, and neuroticism – have consistently been identified by personality researchers. Past research has found higher levels of neuroticism (i.e., emotional instability) in women in more egalitarian countries,[5] and women in these countries are more likely to use HCs,[6] which could indicate that differences in personality reflect differences in synthetic hormone exposure. Given that women using HCs experience greater levels of jealousy, an emotion associated with neuroticism,[7] than naturally-cycling women,[2] and that the level of synthetic estrogen within HCs predict jealousy and mate guarding,[2,8] it is likely that synthetic estrogen influences women's personality. Indeed, when combined with low extraversion, high neuroticism predicts negative interpretations of objective life events[9] and low subjective well-being,[10]

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which, if related to HC use, may partially explain increased incidence of negative affect and depression among contraceptive users.[1] Therefore, the current study investigates differences in personality as a function of synthetic hormone dosage among women using HCs. It is predicted that synthetic estrogen level will predict women's personality traits, particularly neuroticism and extraversion.

METHODS

Participants

One hundred and fifty-four women (Age: M=29.37 years, SD=5.66, range=18-40) who reported currently using HCs participated in this study. All but 10 were Caucasian (1=Asian Indian, 3=Asian, 2 Filipino, 4=unspecified or biracial), 27 were single, and none were currently pregnant. Informed consent was obtained from all individual participants included in the study.

Procedure

Participants reported their sex, age, ethnicity, relationship status, the brand of HC they use, their use of other hormonal supplements, and the date their last child was born (if applicable). No participants reported any use of other hormone supplements within the last 3 months and none had given birth within the last 6 months. Next, participants completed the Big Five Inventory 44-item personality inventory (BFI-44).[11] The BFI-44 is a self-administered personality test that measures the broad-level Big Five personality traits. It contains 44 statements that are each measured on a 5-point Likert scale (anchors: 1=strongly disagree, 5=strongly agree), shows high test-retest reliability, and correlates strongly with other personality scales.[11] High scores on any of the 5 measured personality traits indicate a high tendency toward that particular trait. Testing was conducted online.

Initial Processing of Data

Following previous work,[2,8] the exact doses of synthetic estrogen and progesterone were determined for each participant (averages were used for multiphasic contraceptives). Participants were separated into a high and a low synthetic estrogen group and a high and a low synthetic progesterone group using a median split. With the exception of one participant taking a HC that is exceptionally high in synthetic estrogen (*Zoely*: 1.5 mg), synthetic estrogen dose ranged from 0 µg (e.g., *Ortho Micronor*) to 35 µg (e.g., *Necon*). Excluding this participant did not alter the findings. Synthetic progesterone dose ranged from 14 µg (*Skyla*) to 150 mg (*Depo Provera*). The levels of synthetic estrogen and progesterone were not correlated (r_{154}=-.031, p=.70).

Kolmogorov–Smirnov tests showed that all traits on the BFI (all D_{154}>.078, all p<.022) except neuroticism (D_{154}=.061, p=.2) were significantly non-normal, hence non-parametric Mann-Whitney U-tests were used. However, the results below are equivalent to those obtained using independent samples t-tests. All statistics are two-tailed.

RESULTS

There were significant differences between women in the high *versus* low estrogen groups in extraversion (U=2183.5, Z=2.699, p=.007, r=0.23) and neuroticism (U=2355.5, Z=2.073, p=.038, r=0.17), whereby extraversion was lower (M=23.71, SD=.64) and neuroticism was higher (M=24.21, SD=.52) for women in the high estrogen group than in the low estrogen group (extraversion: M=26.05, SD=.55; neuroticism: M=22.48, SD=.57). There were no other significant effects of synthetic estrogen and there were no effects of synthetic progesterone level on any personality trait (all p>.36).

Next, a univariate Analysis of covariance (ANCOVA) (dependent variable: extraversion; fixed factors: hormone dose [low estrogen, high estrogen]; covariate: neuroticism) revealed a marginally significant main effect of synthetic estrogen ($F_{1,154}$=3.321, p=.07), with extraversion being lower in the high synthetic estrogen group than in the low synthetic estrogen group. There was also a main effect of neuroticism ($F_{1,154}$=75.719, p<.001), indicating that neuroticism significantly predicts extraversion (r=-.593, p<.001). A second ANCOVA (dependent variable: neuroticism; fixed factors: hormone dose [low synthetic estrogen, high synthetic estrogen]; covariate: extraversion) revealed no main effect of synthetic estrogen level on neuroticism when controlling for extraversion ($F_{1,154}$=.476, p=.49), suggesting that extraversion moderates the effects of synthetic estrogen on neuroticism.

DISCUSSION

Here, extraversion was lower and neuroticism was higher among women taking HCs higher in synthetic estrogen. Low extraversion and high neuroticism predispose people to experience more negative objective life events[9] and predict low subjective well-being,[10] relationship satisfaction, and intimacy,[12] and high anxiety, depression,[13] and jealousy.[14] Together with other research on HCs,[2-4,8] this suggests that high levels of synthetic estrogen within HCs may negatively impact personality, which may have downstream consequences on intra-couple and other social behaviors. Still, future research should more explicitly test the relationship between synthetic estrogens and happiness, relationship satisfaction, and sexual satisfaction. For instance, Roberts et al.[15] examined the influence of HCs on relationship and sexual satisfaction among women who were *versus* were not using HCs when they met the father of their first child. HC users reported lower sexual satisfaction and lower partner attraction than non-users. They also reported decreasing sexual satisfaction during the relationship and were more likely than their partner to initiate a separation if it occurred. However, HC users were less likely to separate from their partners overall and reported being more satisfied with their partner's financial provision compared to non-users.[15] Differences or chances in personality between these groups and/or synthetic hormone dose may mediate some

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of these findings.

It is possible that the observed HC-related differences in personality may be a direct consequence of neurological alterations brought about by the pill. Recently, Petersen, Tourouto-glou, Andreano, and Cahill[16] linked oral contraceptive use with localized decreases in cortical thickness in the lateral orbitofrontal cortex and the posterior cingulate cortex. These brain regions are believed to be involved in emotion regulation and the evaluation of internal states, respectively,[16] and have been linked to between-subjects differences in personality.[17] When taken with the results of the current study, it is possible that the synthetic estrogen found in combined HCs may act to decrease the cortical thickness of these brain regions, which may in turn cause associated changes in extraversion, neuroticism, and other associated behaviors. Although highly speculative, future research should investigate this possibility.

Additional analysis revealed a near-significant trend whereby extraversion was lower in the high estrogen group when controlling for differences in neuroticism. This main effect likely fell just short of significance due to a loss of power because synthetic hormone dose could not be randomized across participants.[18] There were no equivalent effects of synthetic estrogen level on neuroticism when controlling for extraversion, indicating that extraversion may moderate the effects of synthetic estrogen on neuroticism. However, extraversion negatively predicts neuroticism, suggesting that introversion often presents with high neuroticism in the current sample, which may be indicative of differences in self-esteem between the high *versus* low estrogen groups. Indeed, self-esteem is characterized by low extraversion and high neuroticism.[19] Alternatively, synthetic estrogen may decrease women's social dominance. Extraversion is characterized by social ability,[20] and is positively related to social status[21] and social dominance/leadership.[22] Thus, the current findings suggest that synthetic estrogen may decrease a woman's social dominance, social status, and/or related constructs, which could negatively impact aspects of patient well-being. (e.g., stress, health).[23] However, this hypothesis is also highly speculative and more direct investigations of the relationships between dose of synthetic hormones in combined HCs and self-esteem, social dominance, social ability, and subjective well-being are warranted.

CONCLUSIONS

The current study used a nonexperimental between-subjects design. Therefore, it remains a possibility that unknown individual differences are confounding the results. Future research should examine these variables using a pre-post design in order to better gauge changes in personality before *versus* after initiating HC use. Alternatively, scholars could experimentally manipulate synthetic hormone dose, preferably using a within-subjects design, to better investigate cause-and-effect relationships between synthetic hormones and personality traits. Researchers should also investigate the relationship between HC-related personality changes and neurological alterations like those observed by Petersen et al.[16] as well as other associated behaviors. Nonetheless, this study adds to the existing literature on the effects of synthetic hormones on human behavior and opens up exciting avenues for additional enquiry.

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Research

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The "I"s have it: Sex and Social Status Differences on Twitter

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ABSTRACT

We examined the use of "I" in Tweets posted by 50 famous people during a one-month window. The linguistic inquiry and word count (LIWC) was implemented to determine the percentage of 140-character Tweets that used the personal pronoun "I". Our findings showed patterns typically seen in natural speech. Specifically, women used the self-referent focus "I" significantly more often than men did, and lower status (operationalized as the number of Twitter followers) people used "I" significantly more often than those with higher status. Men of low social status used significantly more "I" language than did women with lower social status, but women and men of higher social status used "I" equally. Our findings suggest that social status may alter sex-linked communication, with the use of an informal and friendly style that includes self-referencing by men of lower social status, perhaps in an effort to engage more people and enhance their own status through more self-referencing.

KEYWORDS: Personal pronoun use; Twitter; Linguistic Inquiry and Word Count (LIWC).

ABBREVIATIONS: LIWC: Linguistic Inquiry and Word Count; ANOVA: Analysis of variance; IRB: Institutional Review Board.

INTRODUCTION

Because people usually focus on content words in conversation and written text, they may miss the significance of function words that more accurately signal people's motivations, personality, and psychological states.[1] For example, Barack Obama's November 12, 2012 Tweet *Four more years*, one of the most shared and re-tweeted posts ever, may tell followers that the re-election was confirmed. However, that Tweet does not have the same meaning as *I won* or *We won*, which would have told followers something different about the person sending the Tweet while conveying the same content.

The LIWC analyzes text and classifies word use according to different parts and types of speech, using a built-in dictionary of approximately 6000 words.[2] The ability of the LIWC program to accurately identify psychological states of language users through their language has been validated in several ways, using many types of writing samples in multiple contexts.[3] The LIWC program categorizes different aspects of word use that tap social processes (e.g., relationships), affect (e.g., positive and negative emotion), cognitive mechanisms (e.g., causality, discrepancy), and linguistic dimensions, such as pronouns. It is these linguistic "function" words that actually say more about a speaker's emotional state, cognitive sophistication, and demographic background than do content words.[1]

Pennebaker[1] argued that pronoun use is an important social marker for age, sex, and social status; its use also provides insight into a speaker's psychological state. Although "I" is used more than any other word, comprising 3.64% of our speech[1] its use does not signal narcissism.[4-6] However, the use of "I" is common among those who are anxious, insecure, neurotic,

or self-conscious in a situation.[7,8] In contrast, use of "you" in social media is a marker of people who are open and conscientious.[9] First-person pronouns are more common in the language of people of lower status,[10] and they also decrease judgments of a speaker's competence.[11]

Enhanced vocal use of "I" is more common in women, because of higher levels of interpersonal focus in comparison to men.[12,13] This sex difference in the use of first-person singular pronouns is seen across a wide variety of contexts.[14] Younger people are more likely to use first-person singular,[12,15] but older people use fewer first-person pronouns, more future tense verbs, and their word and sentence length increases as they age.[16] Moreover, "I" use is prevalent in the dynamic style of speaking that focuses on using narrative or storytelling to convey points, with fewer complex words that show cognitive mechanisms.[17]

Research using methods other than the LIWC as its primary analytical tool, nevertheless, supports the LIWC findings. Specifically, the open vocabulary method used by Eichstaedt and colleagues[18,19] demonstrated a clear relationship between the content of speech (i.e., words used) in social media and personality characteristics,[18] as well as health and well-being.[19] Several of these characteristics differ reliably across age and sex, confirming that women and younger people show openness and the use of articles in their speech. Therefore, content words, as well as function words provide clues as to people's motivations and psychological states[15] in addition to their age and sex.

Given that much communication is in a short, written form such as texts, Facebook posts, and Snapchat captions, linguistic patterns contained in various types of planned writing may also be seen in online writing. One such online source is Twitter, a social media site that is open-access (i.e., every Tweet still exists and is easily accessed, regardless of whether you are on Twitter), and which allows only 140-characters per Tweet, forcing users to be succinct in their expression. Reuters[20] estimated that 500 million Tweets are sent each day. These communications afford an opportunity to examine self-referencing in a natural, daily setting among people who have a large number of followers. Therefore, our study examined how short language bursts reveal differences in self-reference through personal pronoun use, according to popularity (a measure of social status), age, and sex of actors. Specifically, we predicted that women and actors with a lower social status on Twitter would demonstrate more personal pronoun ("I") use in their Tweets.

METHODS

Sample

Tweets from a 30-day period (July 27, 2015 to August 26, 2015) were taken from 50 different famous people. Men and women actors (n=25 each) who were ranked on www.ranker.com as the "most popular" in 2015 were targeted for our sample if they had an active (i.e., having tweeted in the past 30 days at least one time) Twitter account and used Twitter in English. We chose the most popular 25 women actors and 25 most popular men actors from separate ranking lists. Because famous people sometimes have others pretend to be them, we verified the Twitter account by either checking the blue circle on the account to look for a white checkmark (which means that the Twitter corporation verified to whom it belonged), or we went to the target person's website and located the Twitter account link. The final sample included 2128 Tweets.

Determining Social Status

We took a median split of number of followers, our operationalization of social status, for each Twitter user (Mdn=1,063,500 followers, SD=3,610,545), and their age (Mdn=45, SD=14.19). The rationale for using a median split (as opposed to dividing the sample into thirds to examine potential quadratic effects) was to avoid potentially discrepant and significantly small within cell sample sizes that could severely diminish power. A t-test confirmed that the median split for number of followers yielded two groups (low, high) differing significantly in the number of followers, $t(48)=4.63$, $p<.0001$. However, there were no statistically significant differences in the number of followers as a function of sex, $t(48)=1.76$, $p>.05$, or age $t(48)=.70$, $p>.05$. The final sample of Tweets classified by user sex, age, and social status is seen in Table 1.

	Number of tweets
Sex	
Men	1025
Women	1103
Age	
<45 years	1393
>45 years	735
Social status *via* followers	
<1,063,500	1053
>1,063,500	1075

Note: Age and social status divisions were determined by median split of the sample of Twitter users.

Table 1: Tweets by user sex, age, and social status.

Dependent Measure

Each person's Tweet was copied and pasted into a separate word document and entered into the LIWC software, using its standard dictionaries that have been validated by the comparison of judges analysis of written text.[2] We then calculated the percentage of "I" first person personal pronouns in each Tweet.

RESULTS

Preliminary Analysis

We first determined if there were outliers in the percentage of "I" tweets. Using a criterion of z=3.29, $p<.001$, 34 tweets from 16 different people (18 low social status and 16 high social status;

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21 men and 13 women) were observed. If one or two persons dominated the outliers, then they would be removed from the analysis. However, because the outliers were somewhat uniform in distribution across people and believing that people may phrase their tweets differently and quickly, we opted to include all tweets given that only 1.5% were outliers. Next, we found that age *via* the median split did not influence "I" use, $t(2126)=.89$, $p>.05$, therefore we excluded age from subsequent analysis.

Sex Differences

Percentage of "I" language was examined in a 2×2 (sex × social status) between-subjects analysis of variance (ANOVA). The results produced a statistically significant main effect of sex, $F(1, 2124)=4.05$, $p<.045$, with an observed power of .52. As seen in Table 2, women used significantly more "I" language than did men.

Social Status Differences

As shown in Table 2, those with lower social status (i.e., fewer followers) used a significantly higher percentage of "I" language compared to their peers with more followers, $F(1, 2124)=26.14$, $p<.0001$. The observed power was .99.

Sex × Social Status

A statistically significant sex × social status interaction was obtained, $F(1, 2124)=3.90$, $p<.049$, with an observed power of .51. As illustrated in Figure 1, tests of simple effects revealed that men with few followers used "I" significantly more than did men with many followers $F(1, 2124)=25.11$, $p<.0001$. A similar pattern was seen among women. That is, women with fewer followers used significantly more self-focused language than did those with many followers $F(1, 2124)=4.92$, $p<.028$. More importantly, men with few followers showed a significantly greater percentage of "I" in their Tweets than did women with few followers, $F(1, 2124)=7.95$, $p<.006$, but that among those with many followers (i.e., high social status) there were no statistically significant sex differences in "I" language, $F(1, 2124)=.01$, $p>.05$.

Additional Caveat

The cell means from the foregoing analysis are shown in Table 2. We note that the standard deviations of the "I" percentage are twice as large as the means, suggesting a lack of normality in the distribution, which was confirmed by a Shapiro-Wilk test (W=.565, *df*=2128, $p<.0001$). Although this might result in a loss of power, all hypothesis tests were still statistically significant.

DISCUSSION

Our results showed that those of lower social status in our sample of famous Twitter users used "I" more than did those of higher status, and that women did so more than men, but that social status obviated sex differences in "I" language. Men with lower social status used more self-referencing than did women with lower social status, but among high-status (i.e., heavily-followed)

	Sex		Total
	Men	Women	
Followers			
Above Median	2.00 (SD=4.81) [884]	1.99 (SD=4.37) [189]	2.00 (SD=5.49)
Below Median	4.19 (SD=6.60) [141]	2.96 (SD=5.28) [914]	3.12 (SD=4.74)
Total	2.30(SD=5.15)	2.79(SD=5.15)	

The number in brackets represents the number of tweets for the particular cell.

Table 2: Percentage of "I" use as a function of sex and social status (number of followers).

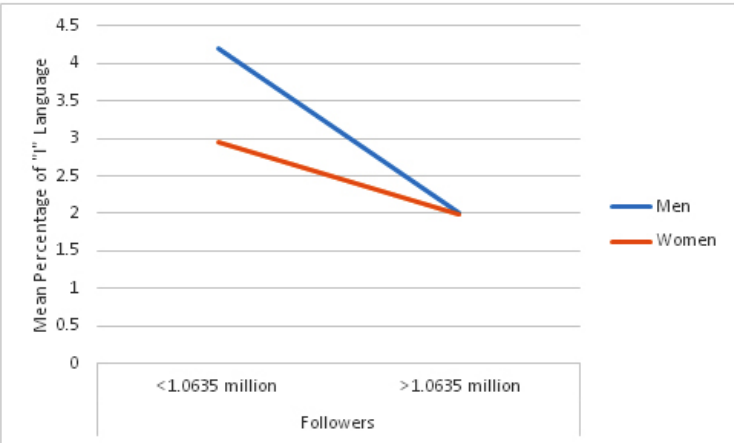

Figure 1: Percentage of "I" language according to sex and social status.

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Twitter users, no sex differences were seen. It is noted, however, that there was quite a disparity in the number of tweets within each level of sex and social status group. Although our findings that women and low-status people used "I" more is consistent with the literature[1,10,12,14] with regard to pronoun use, the data also suggested that self-referencing among people of high status may reflect a different communication style than the typical linguistic profile. Specifically, only men with lower social ranking used *more than* the typical amount of "I" language 3.64%,[1] and everyone else used less. Whether this outcome was a function of medium (i.e., 140-character bursts), target sample (50 most famous celebrities), or both, is in question. Nonetheless, our data suggest that examination of language patterns might include social status as a variable that may mitigate typical sex- and age-related patterns.

One possible explanation for high status Twitter users writing "I" less often is that its use may be a function of more formal, complete language expressions, and a lack of comfort with the medium, despite the social popularity (*via* followers) of the Twitter user. Twitter users with a higher social status may have used their following as a platform to Tweet about various causes, thus removing themselves from their Tweets. A second explanation is that higher-status users with many followers may have been more personally (or media) secure.[7] Alternately, the use of "I" is more common in a storytelling or dynamic communication style that uses narrative, rather than linguistic devices with complex cognitive and causal mechanisms.[17] Therefore, lower social status may have led to users to affect a chattier and informal style designed to garner followers. The downside, however, is that such personable language may have reinforced the Twitter user's lack of social status and called his or her competence into question.[10,11]

Although women used "I" more than did men, our results showed no meaningful differences in "I" use between men and women actors with many followers, a finding that is in contrast to documented literature using multiple samples indicating that women use the first person-pronoun more often than do men.[1,3] Although many LIWC studies use populations not limited to college-aged students,[8,18] most include a preponderance of persons in the college-age range whereas our sample did not. This suggests that social status, as it manifests itself in a spontaneous medium, may be more essential to expression than sex. In regard to age, differentiations between "older" and "younger" was a function of the sample and, on a more practical level, somewhat artificial, as our Twitter users (ranging from 22 to 84-years old) were generally middle-aged. Thus, it is not surprising that we found no evidence of age-related differences in "I" use.

Although our findings shed light on the use of first-person pronouns in quick language bursts, the sample we used does not reflect the typical sample of Twitter users. We operationalized social status according to the number of Twitter followers, which in our sample ranged from around 25,000 to over two million, whereas the average number of Twitter followers for any given user is 208.[21] Moreover, Twitter posts may change in mood over the course of a day,[22] becoming less positive (and probably less "I" oriented) as the day goes on. Finally, it is possible that although the accounts belonged to the persons in question, the Tweets themselves may have been written by publicists posting on social media for the famous persons.

A second limitation of our study is that the Twitter users were primarily American, and mostly White. Thus, our findings are generated from a culture where the use of first-person pronouns and self-focus predominate, in contrast to other more collectivist cultures. It is important, therefore, to examine similar sex and status-related language differences in people other cultures and among a sample that is more inclusive of persons of different races and ethnicities.

In sum, this study of "I" use in Twitter posts by popular actors revealed that language use on social media mirrors some aspects of natural language use, but in other aspects it may be different from that which is written or spoken. Moreover, Twitter language may be different from language on social media that affords longer thoughts to be posted, such as Facebook. Further research might include other measures of social status outside of followers to verify, whether other measures of status qualify "I" use patterns that are a function of age and sex. Our results do, however, contribute to the body of research that provides insight as to how public utterances may reveal private selves and motivations.

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NOTES

Authors did not add median split of age as a two-level factor in the design along with social status and sex because there were no Tweets by older women with many followers and only 25 tweets from older men with few followers.

CONFLICTS OF INTEREST

The authors have no disclosure or competing interests and this research was unfunded.

CONSENT

There is no consent required for research with public documents, and research used public-domain material (Twitter), which does not require Institutional Review Board (IRB) approval.

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Case Study

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Partnerships in Civic Engagement: Cultivating Transformational Campus-Community Relationships Built to Last

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ABSTRACT

A critical feature of contemporary models of civic engagement is mutually-beneficial collaboration between campus and community partners, in which all members contribute knowledge, skills, and experience to co-create knowledge. To date, most research has focused on student outcomes, and we know much less about how to develop successful campus-community partnerships. This article reviews the challenges and opportunities in establishing and maintaining these partnerships to address issues in Trenton, NJ, USA. We first review best practices for developing partnerships between potential stakeholders on campus and in the community. We then describe the infrastructure at The College of New Jersey (TCNJ) that supports the development of these partnerships and present 3 case studies that highlight how they were maintained to offer a range of civic engagement activities that benefit all stakeholders involved in the collaboration. Finally, we present recommendations for developing and maintaining partnerships at other institutions.

KEYWORDS: Service-learning; Community engaged learning; Campus-community partnership; Civic engagement.

INTRODUCTION

In the context of higher education, civic engagement refers to service, teaching, and/or research that is conducted both in and with the community.[1,2] It includes a range of activities–service learning, community-engaged learning, community-based research, participatory action research–and provides important experiential learning opportunities in higher education.[3,4] To date, most research has focused on student outcomes associated with service learning.[5] Although it has been defined in different ways, a broad consensus exists that service learning should integrate academic material, relevant service activities, and critical reflection, as well as be based on reciprocal partnerships that engage students, faculty, or staff and community members to achieve academic outcomes, promote civic learning, and advance public purposess.[6] Service learning has gained prominence in higher education as a high-impact practice that enables active learning and can encourage innovative pedagogical strategies that achieve positive learning outcomes for students.[7-9]

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Today, developing collaborative campus-community partnerships to co-create knowledge is both the norm and an aspiration within higher education civic engagement practice.[10] In the Carnegie Foundation's Community Engagement Classification, partnership is considered a defining attribute of the publicly engaged institution. These collaborations, however, are difficult to achieve, as they are based on relationships between individuals and institutions from (sometimes dramatically) different contexts.[11]

This article describes how staff and faculty at The College of New Jersey and community organizations in Trenton, New Jersey, USA developed campus-community partnerships to address social issues affecting local populations. Trenton's history of poverty, juvenile crime, gun violence, unemployment, and other community-level problems provides civic engagement opportunities for local students in a landscape of community organizations eager for collaboration. We present three case studies that highlight how the partnerships developed and were maintained to offer a range of civic engagement activities that mutually benefit all partners in the collaboration and to illustrate a series of best practices in partnership stewardship. We also present recommendations for developing and maintaining partnerships at other institutions.

Civic Engagement in Higher Education

A growing number of universities and colleges across the United States have committed to civic engagement initiatives that go beyond individual classrooms and move toward a fully engaged university. For instance, since it was founded in 1985, Campus Compact's membership has grown to over 1,000 colleges and universities that have made an institutional commitment to civic engagement and service-learning.[12] This development reflects an evolution of thinking about higher education's role in communities, recognizing that colleges and universities must play a more substantive role in addressing the problems facing communities locally, nationally, and globally.[13] The publication of *A Crucible Moment: Civic Learning and Democracy's Future* marks a milestone in this transition. The report calls for investing on a massive scale in higher education's capacity to renew this nation's civic, social, and intellectual capital.[4] The call to action is for every college and university to promote a civic ethos that governs campus life, make civic literacy a goal for every graduate, integrate civic inquiry within general education and majors, and advance civic action as a lifelong practice.

One of the defining features of contemporary models of civic engagement is mutually-beneficial collaboration, in which all members contribute knowledge, skills, and experience to determine issues to address, questions to ask, problems to resolve, strategies to use, outcomes that are considered desirable, and indicators of success.[14,15] While institutional commitments to civic engagement have increased, colleges and universities have struggled to narrow the distance between universities and communities, as well as document the impact of campus-community partnerships.[16-19] One major shortcoming of existing research is the lack of convincing evidence about the authentic nature of campus-community reciprocity.[18,20-24] Research indicates that students gain academic, psychological, and social benefits from participating in high-quality civic engagement experiences,[25] but because most research has focused on student outcomes, we know much less about how community organizations perceive these experiences and what benefits they gain.

Campus-Community Partnerships

At the foundation of all forms of civic engagement are the partnerships that develop to create and support collaborative efforts. In 2000, Cruz and Giles suggested that the "university-community partnership itself be the unit of analysis" (p.31) in service learning research. Soon after, Enos and Morton provided a framework for examining the quality of relationships in civic engagement and distinguished between transactional and transformational relationships.[26] *Transactional* relationships are instrumental and often designed to complete short-term tasks. All parties benefit from the exchange, and no long-term change is expected. In contrast, *transformational* relationships occur when all parties grow and change because of deeper and more sustainable commitments. In a transformational relationship, individuals come together in more open-ended processes that take place over longer periods of time. All parties bring an intention–or, at least, an interest–to explore emergent possibilities, revisit their own goals, and develop products and systems that are mutually beneficial.

Building on this distinction, Bringle, Clayton, and colleagues differentiate between *relationships* and *partnerships*.[11,14,15] Relationships refer (generally) to any type of relationship or interaction between people, while partnerships refer (specifically) to relationships with certain qualities (e.g., frequent interactions, trust, common interests, respect, good communication). Thus, not all relationships are partnerships. To identify potential partners relevant to and involved in service learning, the researchers introduced the SOFAR Model. They note that it is important to delineate different campus and community groups because, at a minimum, there are 5 key types of stakeholders or constituents who bring different perspectives to the table: students, staff of community organizations, faculty, administrators on campus, and community residents. At any given time, multiple relationships may require attention–for example, dyadic relationships between faculty (F) and staff of community organizations (O) or triadic relationships between students (S) faculty (F), and community residents (R). Co-creating knowledge and outcomes within this context is an ambitious goal, as there are complex and often unpredictable differences to navigate within as well as across groups of stakeholders.[11,14,15]

Although transactional relationships may be appropriate in some situations, the development of partnerships–based

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on transformational relationships between stakeholders–is now considered best practice for campus-community engagement. These partnerships, however, are rarely or only partially achieved.[10] This is not surprising given that partnership within the context of civic engagement is fundamentally relational, and relationships are difficult to build and maintain. Campus-community partnerships are particularly challenging because they bring together individuals and groups that span (sometimes dramatic) differences with the expectation that they will work together toward a shared vision. Improving our understanding of what it means to be in and nurture transformational relationships is important for developing the practice of civic engagement and institutionalizing the cultural norms that help partnerships thrive.[11]

Current Paper

The current article describes the development of partnerships between The College of New Jersey (TCNJ) and 3 organizations in the City of Trenton designed to address social issues affecting local communities. What began as a campus-wide requirement for all freshmen to document 8 hours of community service has blossomed into a multi-faceted effort that touches every academic department on campus and, in the process, has transformed the relationship that this public college has with its immediate and neighboring community. TCNJ's experiences in attempting to adopt and implement the definition of *partnership* described by Bringle, Clayton, and colleagues suggest that the process requires 2 related, but distinct, attitudes. The first is a stubborn commitment to the well-being of all parties involved.[10,25] When we connect ourselves to the fate and experiences of others, we are more likely to establish authentic relationships where we work together to develop and carry out ideas and activities. The second is a commitment to strength-based problem solving.[27] This approach, originally developed in the field of social work, is essential for civic engagement as it emphasizes the principle that all people bring resources to the table. As such, all people and organizations in a campus-community partnership are viewed as potential resources for solving problems. The approach emphasizes the value of identifying strengths at different levels (e.g., individual, school, neighborhood) and using these strengths as levers of change.

In particular, we discuss how the partnerships have developed layers of connection between campus and community–what health services professionals consider a continuum of care or what engineers might call redundancy structures.[10] These layers of connection provide programmatic structures and resources for partners to get the sustained and reliable relationships they want and need throughout the year, and for multiple years. For community partners, the connections can help to reduce gaps in services or products that can negatively impact an organization and its clients.[25] For campus partners, the connections can help faculty maintain important community-based scholarly or pedagogical projects that might otherwise lose momentum during an academic break, sabbatical, etc. or can provide a range of additional community organizations with which to partner in the case of additional partnership opportunities. In the following sections, we first describe the context of TCNJ's civic and community engagement work. We then present the infrastructure that supports the development of campus-community partnerships. Finally, we present case studies that illustrate how partnerships between TCNJ and three community-based organizations (CBOs) were developed and maintained with three to identify and achieve mutually reinforcing goals.

The Context: Trenton, NJ, USA

Despite being the state capital, Trenton is an economically distressed small city. According to the 2014 American Community Survey,[28] Trenton is home to nearly 85,000 residents, with more than one quarter of its residents (28.4%) having incomes below the poverty level. The unemployment rate of 11.4% is widely held by community-based organizations to grossly underestimate long-term joblessness among subpopulations, especially young, African American men and young mothers. Poverty is particularly concentrated in female-headed family households with dependent children: 45.7% of these households with children under 5 report incomes below the poverty line. Median household income is less than half of both the Mercer County and New Jersey state medians at $35,647, and 27.4% of households received food stamps and/or SNAP benefits. Only 71.3% of residents have at least a high school degree (or equivalent), compared with 87.1% in the county and 87.6% statewide. Only about 1 in 10 (10.7%) have at least a bachelor's degree, compared with 39.8% in the county and 36.4% statewide. In 2012, Trenton reported the lowest high school graduation rate in the state: 48.4%.[29] In 2015, the Trenton school districts four-year graduation rate was 68.6%, ranging from 29.1% at the public alternative high school to 79.7% at Trenton Central High School.[30] Trenton has seen significant racial and ethnic turnover in the past four decades. In 1970, Trenton was 61.4% white, 37.9% black, and only 5.7% "Spanish language" speakers.[31] The foreign born population of the city amounted to just 7.7%, although "foreign stock" (immigrants and their children) constituted nearly one quarter of the population.[31] By 2014, only 32.2% of the City population was white, with more than half (50.9%) identifying as black or African American and 34.0% Latino. Nearly one quarter (23.6%) of the city was born outside of the United States, with a vast majority of these non-citizens (78.0%) who identify as Hispanic/Latino (65.7%). More than one third of all households (36.9%) speak a language other than English at home, and more than one-fifth (20.1%) speak English less than "very well".[28]

Infrastructure for Campus-Community Partnership

TCNJ is a highly-selective, residential public college located in an inner-ring suburb, about 5 miles from downtown Trenton. Formerly called Trenton State College (among other names over

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the past 150 years) and located in Trenton until the 1930's, TCNJ changed its name in the mid-1990's as part of a dramatic transformation of the College's academic mission and image. Over the past 15 years, TCNJ has developed a robust infrastructure to support and develop rigorous community engaged learning activities. Since its early-adopted community engagement requirement (established in 1995), all TCNJ students have been required to complete a Community Engaged Learning (CEL) experience through an organized community-based experience, either through a first-year seminar or a co-curricular one-day experience. In 2014, community engaged learning was recognized as one of five Signature Experiences of the college. As a consequence of these and TCNJ's additional community engagement-focused programs, TCNJ received the Community Engagement Classification from the Carnegie Foundation in 2015.

In 2006, under the direction of Patrick Donohue, the then-recently established Bonner Center for Civic and Community Engagement took on the coordination of the First-Year CEL requirement (FYCEL) and began integrating its nascent Bonner Community Scholars program with FYCEL management. Bonner Scholars now organize and lead FYCEL activities and work with staff and first-year seminar faculty to design curricular FYCEL components. If students do not complete their CEL graduation requirement through a curricular project, Bonner Scholars organize the students into co-curricular CEL days with existing partners. These students learn, serve, and reflect together at a relevant Bonner community partner site. They too are led, educated, supported and guided by Scholars who work at the site throughout the academic year. Since 2010, Bonner Scholars and staff have also supported upper-level CEL course components (Advanced CEL, or ACEL) in 15-20 courses each semester.

TCNJ's Bonner Community Scholars Program now includes more than 100 students, more than half of whom are minorities, and each of whom receives a 50-100% tuition scholarship to complete service with community partners. The Bonner Community Scholars work at designated sites for 300 or more hours during the academic year providing direct service and support as needed. The scholars are organized into 12-16 partner-based teams, which are then organized into four issue-based divisions: Education, Juvenile Justice and Re-Entry, Self Sufficiency, and Environment and Food Security. Each division is led by a full-time CEL Coordinator, three of whom are funded by grants or self-generated revenue streams. These staff members anchor the College's relationship with community based organizations (CBOs) and serve as the main liaison between the community organization and TCNJ staff, faculty, and students.

In 2012, the Center for Community Engagement Learning and Research (CELR Center) was created to house the Bonner Institute, consisting of the Bonner Community Scholars and FYCEL programs, and other community engaged-related programs and initiatives. The CELR Center's partnerships are built on a multifaceted approach to developing and maintaining transformational relationships. Between 12 and 16 "deep" partnerships are established each year between the CELR Center and community organizations that serve as the main sites for Bonner Community Scholars to serve and for TCNJ's students to undertake their CEL experiences. Each deep partner works with a team of 3-6 Bonner Community Scholars over the course of the academic year, and the Scholars provide direct service and strive to enhance the partner's capacity. These "deep" partners are the bedrock upon which the CELR Center's efforts are built and represent TCNJ's effort to model the partnerships that Bringle and colleagues describe.[11,14,15]

The first step in establishing partnerships between TCNJ and community organizations is through the CELR Center's partnership application process, whereby staff communicate the opportunities and resources available to potential partners and establish the norms of a potential partnership. This document is shared throughout the community and is revised annually based on partner feedback and TCNJ's, the CELR Center's, and the community's changing needs. The needs of partners across a range of categories–such as direct service, research, planning, training, communications, policy-analysis and resource development–are documented through this application, and CELR Center staff perform an internal assessment of the CELR Center's capacity to support requested projects. Following a review of the proposed projects, and a period of communication between CELR Center staff members and community organization staff members about potential projects and activities, accepted partnerships are communicated with the organization and communication about the coming year begins.

After partnerships are approved, and before the start of each semester, key representatives from each CBO meet with their team of staff and Bonner Community Scholars to clarify and refine the proposed projects. In mid-August, CBO staff and Bonner Community Scholars and CELR staff meet for a half-day Site Planning Process. During this process, Bonner Scholars, CELR staff and CBO staff develop an action plan to complete the proposed projects and, most importantly, address the CBO-identified need. At the end of the Site Planning Process, the team develops a document that details the projects to be implemented and roles and responsibilities of different partners. CELR Center staff then work to connect the agreed-upon projects with curricular and co-curricular options at TCNJ that best match the project's goals. There are two main curricular tie-ins for partner-based projects: the first-year community engaged learning requirement through a first-year seminar, and upper-level discipline-specific courses that include CEL projects.

In addition to the direct and higher-level service provided by TCNJ students, CELR staff help meet CBOs' requests when students are unable to. For example, they help write or co-write grants (increasingly with student involvement) to support partners. This includes obtaining full-time AmeriCorps and VISTA members who are placed at the CBO to provide direct service

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or address other organizational needs. In these ways, there is an intentional and deliberate attempt to share resources and build the capacity of CBOs over the long-term, particularly when the needs go beyond what TCNJ students are able to provide.

This infrastructure also allows the community partner to dialogue with a regularly available professional at the College through the calendar year. Each CBO has a consistent point of contact in the form of one CELR staff member throughout the year. Through their established connections and experiences with TCNJ students, faculty, and staff, community partners can also interact with other TCNJ representatives as needed (e.g., Bonner Community Scholars during weekly visits, professors involved with curricular CEL projects during a given semester). The model recognizes that one class or any one semester- or year-long project is not likely to have a substantial impact. Instead, this model integrates full-time staff members into its design, so that partnerships are able to meet the needs and build the capacity of all partners at TCNJ and in the community through a menu of co-created and mutually beneficial projects and experiences. By developing these layers of connection between campus and community partners,[10] partnership constituents are able to use collective resources to develop and implement comprehensive projects that can have a significant impact. This infrastructure also helps to reduce the gaps in service, activities, and personnel that can make it difficult to achieve project goals and address community-identified needs in a meaningful way.

METHODS

This study used case studies to illustrate the way in which long-standing, multifaceted partnerships meet the needs of both the CBO and the institution of higher learning. The research protocol was approved by The College of New Jersey's Institutional Review Board (IRB protocol #860 1138-19). The following section profiles three examples of how campus-community partnerships developed at TCNJ–not to evaluate the partnerships but to demonstrate TCNJ's instantiation of the partnership model presented by Bringle and colleagues.[11,14,15] When considering which partnerships to present in detail, we purposely selected three different types of exemplars: one in which the CBO depended heavily on the higher education partner, one in which the CBO did not, and one involving a public school.

To develop each case study, we reviewed the annual reports generated by CELR teams from the beginning of the partnership to the 2013-2014 academic year, interviewed the CELR staff members responsible for overseeing all three partnerships, and conducted semi-structured interviews with individuals in leadership positions at two sites. In addition, all of the authors have worked with the case study organizations in a variety of roles across more than a decade. To highlight how these three partnerships developed over time, we summarize each partnership in terms of student-partner engagement (in the form of Bonner Community Scholars and community-engaged learning) and organizational capacity building for the partners involved. These profiles are followed with an examination of how challenges within these partnerships have been addressed.

Academic Sports Academy (ASA)

The Academic Sports Academy (ASA) is an after-school program developed by the non-profit GGrant 94Ft Foundation. Greg Grant, a former professional basketball player and Trenton native, previously ran afterschool programs for middle-school-aged boys, designed to help develop the basketball skills of young players in a local league. However, Grant realized that the players had greater needs for academic support, and he began to require players to attend an afterschool program to get assistance with schoolwork. During this time, about 25 boys were involved in the program. Bonner Community Scholars began their relationship with Grant by tutoring in this program in 2005. The program eventually became permanently established as the GGrant 94Ft Academic Sports Academy in a public K-8 school, where it enrolled about 100 students, divided into six classes of 15-20 students based on grade. Parents pay for the afterschool program on a sliding scale, although students deemed at risk or in great need are often given whole or partial scholarships. In addition, ASA manages a summer day camp in a different K-8 school. At the time of this study, ASA's staff included one full-time Assistant Director, a former Bonner Community Scholar, and one full-time AmeriCorps member (another former Bonner Community Scholar and former student of Grant's). The Assistant Director estimated that five or six Bonner Community Scholars and other TCNJ volunteers can be found working with ASA on an average day, managing classrooms, tutoring, mentoring, and providing or coordinating enrichment activities.

Student-partner engagement: After ASA lost state funding, the CELR stepped in to fill roles previous filled by paid staff. A CELR staff member with appropriate credentials and experience in the Trenton public schools was named as the education coordinator for ASA, and another Bonner staff member directed and organized classroom teams. Bonner Community Scholars in their junior and senior years, usually pursuing education majors, became the classroom leaders in the afterschool program, supported by a team of first- and second-year Bonner Community Scholars and a legion of other volunteers drawn from TCNJ's student population. Each year, a team of roughly 14 Bonner Community Scholars have been the principal classroom staff for the afterschool program, and each spends up to four days per week at the program from roughly 4-6 pm.

On Friday afternoons, ASA's curriculum offers enrichment activities that supplement the programs run during the rest of the week. Several times per semester, these involve content developed by TCNJ students who are enrolled in CEL-designated courses (principally first-year seminars). In one example, TCNJ students administered a social and emotional learning curriculum for K-3 students every Friday for six weeks. Another

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class led a theatre improvisation workshop. Other classes have provided tutors and mentors. TCNJ first-year seminar students often serve as facilitators and chaperones for ASA students on field-trips to places like Ellis Island, the American Museum of Natural History in New York City, the Amish Country of Pennsylvania, Asbury Park, NJ, and a local organic farm. These trips are primarily designed to enhance the content of the TCNJ course. For example, the Asbury Park trip is part of a course on "Bruce Springsteen's New Jersey," and the Ellis Island trip is integrated into a course on "Multicultural New York". However, these trips provide ASA's inner-city students with a variety of opportunities that would be otherwise unavailable because of financial constraints. In addition to serving as chaperones, TCNJ students are asked to adapt the content of their course material to be appropriate for younger students and, in doing so, gain a better grasp of what they are studying.

Advanced, disciplinary course-based projects also provide additional support for the afterschool program. For example, after ASA lost its state funding, an accounting course was recruited to calculate the true costs for the services provided. The Assistant Director notes that these estimates have been useful when she has written grant proposals to support ASA. The website used by ASA and the GGrant 94 Ft Foundation was developed in conjunction with a TCNJ website development course. In 2013, a sociology course evaluated the program, and found that students who attended ASA performed better than their peers on some academic criteria.[32]

Building organizational capacity: ASA has relied on its partnership with the TCNJ's CELR since its inception. Founder Greg Grant and then-TCNJ CELR Director, Pat Donohue, were the coauthors of the $100,000 grant from NJ After 3, which initially provided paid staff for the afterschool program. Donohue and Grant, along with teachers from the Trenton public school system and two advanced Bonner Community Scholars with education majors, wrote the curriculum that refocused the afterschool activities towards academic support and enrichment and no longer required that student participants were involved in athletics. Since this time, the leadership of CELR has also maintained a consistent relationship with ASA and the GGrant 94 Ft Foundation in terms of grant writing and support. CELR has issued letters of support for grants and customarily reviews grant proposals submitted by the foundation for ASA and other initiatives.

CELR involvement has allowed ASA to build its capacity as an organization by providing both personnel and enrichment services. As noted above, curriculum development and implementation were assigned to a member of the CELR staff after the state reduced funding for afterschool programs like ASA. In 2010, the CELR helped ASA secure funding for an AmeriCorps member to spend 1,300 hours managing the afterschool program each year. The Assistant Director interviewed for this project was the first AmeriCorps member assigned to ASA; as a former Bonner Community Scholar, she was able to draw on her knowledge of the TCNJ CEL models to improve the afterschool program activities, develop additional enrichment opportunities (at no cost to ASA or to parents), and to leverage resources dedicated to TCNJ's CEL classes and financial commitments to provide mutually beneficial experiences for the afterschool students.

When she had completed her AmeriCorps service, the former Bonner Community Scholar joined the GGrant 94 Ft Foundation staff full-time as the Assistant Director for ASA, and the CELR found funds to cover one-third of her salary because it was mutually beneficial to both organizations. In this role, she assisted with the institutionalization of the after school program and also worked with the Director to widen its participants from predominantly African American boys interested in basketball to a diverse group of both boys and girls, including non-athletes. The Assistant Director also writes reports on the afterschool program and on students, as requested by the school and teachers at the school. She builds on the common interests of TCNJ students and faculty and of her organization's needs. The partnership became so popular that ASA has had to restrict CEL projects to those whose students demonstrated a strong commitment to ASA over time (and thus, excluding one-day service projects). This popularity is mirrored by CEL projects from TCNJ; the ASA Assistant Director indicated that there are enough CEL classes interested in working with ASA that it has been able to choose among them based on what works best for ASA's curricular and/or enrichment needs.

The Assistant Director cites other advantages of the partnership for ASA in terms of building organizational capacity. She credits policy reports written by Bonner Community Scholars in their junior and senior years for her deeper appreciation of the complexity of urban public education and the limitations of direct service. ASA has also benefited from publicity because of its association with TCNJ, which has a dedicated staff to call attention to its community outreach. The CELR Center has directed high-level state visitors (including the former Attorney General for the State and the Secretary of Higher Education) and media requests to the ASA program, which has now been featured in a variety of regional media. The partnership also benefits from a pre-college program developed at TCNJ that brings roughly 30 high school juniors and seniors each year from across the region to complete community-engaged learning at the summer camp operated by ASA as part of their pre-college coursework.

Isles Youth(Build) Institute (IYI)

YouthBuild is a national program that began in Harlem with the goal of improving the social skills, education, and job skills of young men and women who had dropped out or had been expelled from high school. Isles, Inc., a well-established non-profit organization dedicated to independent and sustainable development in Trenton, founded the Isles YouthBuild Institute (IYI) as

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an alternative school for youth who wanted to learn construction skills while completing their GED (General Educational Development) test or high school diploma. IYI also features extensive soft skills development and cultural enrichment programs, including museum visits and live performances of theatre and music. IYI initially obtained substantial funding through the national YouthBuild program. When this funding was reduced, it was unable to continue providing stipends to enrolled students and came to rely more on community partnerships, including with TCNJ. It is now known as the Isles Youth Institute.

Student-partner engagement: At the time of this study, a team of five Bonner Community Scholars worked at IYI, spending an average of four afternoons each week filling a variety of roles. First, Bonner Community Scholars serve as tutors for IYI students in both the GED and high school diploma tracks. Bonner Community Scholars took the lead on the college preparation components of the YouthBuild program, including helping prepare for the SAT (Scholastic Aptitude Test), helping to complete the FAFSA (Free Application for Federal Student Aid), organizing campus visits, coordinating workshops with college program officers (such as the Educational Opportunity Fund, or EOF), and providing guidance in the actual college application process. Bonner Community Scholars also served as formal and informal mentors to IYI students, who are often similar in age but have had dramatically different life trajectories. The Director of IYI explained that one of the greatest contributions of the Bonner Community Scholars to the program was that they provided a group of near-age peer mentors that value educational achievement, career advancement, and healthy social relationships. Many IYI students in Trenton are the first in their families to graduate high school, so they often lack the social networks that would provide mentors who have attended college and pursued professional careers. In addition, the Director indicates that the soft skills fostered by the personal relationships between TCNJ and IYI students are equally or more important than the construction skills for obtaining employment. Bonner Community Scholars often attend or facilitate cultural enrichment programs for IYI students, including organizing those that take advantage of performing arts and athletic events on TCNJ's campus. In 2013, Bonner Community Scholars began hosting IYI students at the college campus for tutoring once per week so that the IYI students can begin to feel like they "belong" on a college campus. IYI students have also joined Bonner Community Scholars on the annual CELR service trip to New Orleans, where they employ their construction skills in the long-term reconstruction efforts of the Crescent City.

In addition to the collaboration with Bonner Community Scholars, IYI has collaborated with TCNJ CEL courses to enhance their workshops on professional development. The Director cites an example of a course on the topic of networking. First-year students worked with IYI students to develop networking skills in both personal and professional contexts. This partnership culminated with a Networking Fair, where members of the local community came to IYI, and students practiced their networking skills with a "coach" from TCNJ. More advanced, CEL courses have also worked with IYI. One Business class, for example, helped IYI students develop business plans that could be implemented upon graduation.

Building organizational capacity: As part of Isles, Inc. and the national YouthBuild network, IYI already had sophisticated organizational capacity, which included relationships with many other higher education partners that are better resourced than TCNJ. Even so, the Director cites a variety of ways in which the partnership with TCNJ CELR has enhanced their organizational capacity. Most directly, the person in charge of the mentoring programs and coordinating volunteers at IYI had been a former Bonner Community Scholar. In this sense, the partnership has increased the ability of IYI to find and recruit talented staff. This TCNJ alumnus coordinated with a variety of local schools and institutions that provide mentors and tutors for IYI students, but her networks with TCNJ's CELR Center have been a real asset, particularly when she is looking for high quality mentors. In addition, this individual's knowledge of the CELR Center's capacities and internal goals allows her to take advantage of campus resources (such as cultural events) that might be otherwise beyond IYI's budget.

Similarly, IYI benefited from the CELR Center's use of a VISTA member to form a city-wide mentoring coalition that shares best practices information on a regular basis. CELR staff members have also written grants to secure more stipends for IYI participants, and a TCNJ Marketing class developed a multimedia presentation that the organization could use to solicit sponsors for individual IYI participants. IYI has also worked with a political science faculty member to engage students in a policy project that would argue for amending an existing state law that could once again fund this program's scholarships.

Trenton Central High School (TCHS)

Trenton Central High School (TCHS) is the main campus and largest of three public high schools in the city, with 1,554 students in four grades in AY 2014-15.[33] At TCHS, 52.6% of students are Black or African American and another 44.9% are Latino, and 85.9% of TCHS students are eligible for free or reduced lunches. As noted above, TCHS students perform well below averages on the state's graduation exam, as well as national standardized tests like the SAT. For example, mean SAT math, reading, and writing scores for students were 392, 376, and 378 respectively, compared to statewide means of 518, 496, and 494.[34] Only 28.8 of TCHS's graduating seniors go on to a 4-year institution of higher learning, compared with 64.7% of their peers statewide.[34]

Student-partner engagement: TCNJ began its partnership with TCHS in 2005, when the school was divided into smaller learning communities, with many of the most academically successful students in the Medical Arts program, located at the high

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school's West Campus. The CELR was asked to create a community service program for high school students that mirrored the Bonner Community Scholarship emphasis on academic achievement, direct service, and leadership development. This was later formalized in a three-year, privately-funded Bridge to Employment (BTE) grant, which CELR staff helped to write. The CELR supported a full-time AmeriCorps member to run the BTE program, assisted by a team of upper level campus and corporate staff as well as Bonner Community Scholars, who provided direct service as tutors to students as well as contributed to enrichment and college preparatory programs. After seeing the success of the BTE, the TCHS Principal asked about forming an on-going partnership. To do so, the Principal built the CELR into a federal grant; when this funding ended, the CELR wrote and received a private grant to keep the new effort alive. During the same period, a team of eight Bonner Community Scholars began tutoring afterschool for TCHS's basketball team (under Coach Greg Grant, who had been begun working with CELR through ASA). The program then expanded to include the lunch hour and to other athletics programs and eventually to the general student body. By academic year 2011-12, CELR estimated that roughly 100 high school students *per day* received tutoring from Bonner Community Scholars and TCNJ volunteers coordinated by them.

During this time, the TCHS Principal had grown increasingly concerned about the small proportion of students who met statewide graduation standards on the New Jersey High School Proficiency Assessment (HSPA). He contacted the CELR staff liaison, who had previously served as a tutor in the BTE program and a student-teacher elsewhere in the Trenton public school system. Upon earning her Bachelor's in Education, she took a full-time staff position with the CELR. In 2011, the Principal tasked this staff liaison with organizing tutoring for "cusp" students who had near-passing scores on their 8th grade proficiency exams. She created a master grid that connected Bonner Community Scholars, other student volunteers from TCNJ, and TCHS students based on subject area needs and availability throughout the school day. The staff member estimates that in addition to two dedicated TCHS teaching faculty and the eight Bonner Community Scholars, roughly 50 additional TCNJ students tutored about 200 cusp students in preparation for the state exam. While the percentage of TCHS students passing the language section of the exam remained about the same from 2011 to 2012 (60.2% to 59.7%), the number of students passing the math section nearly doubled from 22.9% to 40.0%.[35] Internal evaluation of the students involved in the tutoring program, conducted by CELR staff, demonstrated significant gains among those students who had regularly participated in tutoring. The TCNJ Principal expanded the program in preparation for the 2013 HSPA exam to include an extra month of tutoring and students outside of the marginal score range on the HSPA.

Although no CEL courses have contributed to the programs noted above, course-based projects have been part of the relationship between TCNJ and TCHS. For example, in Fall 2012, a First-Year Seminar course worked with the high school librarian to reinvigorate the book club. CEL projects have also included the creation and retouching of five murals that decorated TCHS's halls and have contributed to the repainting of three teachers' lounges, the stairs in the gym, and the front entry arches. Notably, CEL projects attached to summer courses at TCNJ have been critical in these building restoration projects, as they generally must be completed when few or no students were using the high school's facilities. Likewise, when TCHS piloted an 8th grade transition summer program for at-risk students (see below), the program integrated tutors and mentors from students enrolled in summer college courses.

Building organizational capacity: The partnership has grown from one that simply provides tutors for high school students to one where CELR staff take part in the planning and policy development of the high school itself, as well as the evaluation of programs implemented through this partnership. Following on the success of the program, the TCHS Principal, in collaboration with a CELR staff member, and a coalition of community-based organizations, proposed and piloted a district-wide 8th grade transition program, whereby students transitioning to TCHS received information and support towards successfully navigating the high school and its curriculum during the summer between 8th and 9th grades. CELR staff, especially the TCHS liaison, and Bonner Community Scholars were continuous participants in discussions about shaping the content of the summer program, and Bonner staff and TCNJ students played a central role in its operation. CELR staff even arranged for the program to take place on the TCNJ campus, and integrated mentors from the residential summer Pre-College high school program. In addition, CELR staff have helped the high school coordinate a partnership with a local mental health organization to identify and provide counseling for at-risk boys. The CELR Education team leader has also collaborated with the TCHS Principal on other community initiatives, including a program that places candidates for TCNJ's Master's of Educational Counseling in TCHS's counseling office and an effort to obtain approval for a university-based team to digitize TCHS's data as means to identify students at risk for dropping out.

DISCUSSION

The case studies above demonstrate how the partnerships between TCNJ and CBOs reflect transformational partnerships, rather than transactional ones. Transformational partnerships are maintained over time by having staff at the College and at the non-profit with a working familiarity of both sides of the partnership, collaborative planning, resource sharing, and a track record of successful programs. These relationships can better weather changes in personnel, CEL projects that do not work, and changes to institutional resources. For instance, the ASA partnership continues to thrive and has begun its second decade working with TCNJ. The support provided to ASA throughout the calendar year and the additional funding that has been se-

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cured to support ASA, has dramatically increased ASA's capacity and impact in the community.

Addressing Challenges in Partnerships

At the same time, even transformational relationships are subject to external disruptions that can derail the partnership and limit opportunities. For example, the TCHS Principal noted above was replaced in 2013, and the following year, the physical building housing TCHS was closed and demolished, sending students to four temporary sites around the city. With the changes in the high school, the 8th Grade Transition program was discontinued and tutoring programs were scaled back and physically relocated. In addition, over the past two years, the IYI site has lost funding and the program no longer has a need for Bonner Scholars support. This was not due to a poor partnership design, rather a change in the community context of the organization's needs, TCNJ's capacities, and external funding constraints that lie beyond the limits of even the strongest partnerships.

Partnership within the context of civic engagement is fundamentally relational, and much like deep friendships, partnerships need ongoing care and cultivation. Each of the community organizations interviewed acknowledged that there are consistent challenges to making these partnerships work. These challenges are generally similar to ones previously identified in the literature: significant investment of time, incompatibility of short-term service with the long-term needs of clients, and the incompatibility of campus (9-month) and community (12-month) calendars.[25] On any given day, addressing these challenges has required, from all parties involved, a combination of consistent attention, stubborn commitment, patience, flexibility, acceptance, empathy, humility, creativity, and a generous sense of humor.[10] Most important to this collective work has been the reminder that there are multiple constituencies who are relevant to and involved in civic engagement (e.g., students, staff of community organizations, faculty, campus administrators, community residents), and the interactions between these different constituencies are dynamic and distinct.[11,14,15]

Developing Layers of Connection

Although civic engagement is usually described in activist terms, partnership requires a willingness to be receptive–being attentive to the distinct experience of another and being open to being moved and even changed by the other.[10] According to McDaniel, an essential ingredient of authentic relationships is "deep listening", a process that occurs when we listen to other people without trying to change them for any reason.[36] This type of listening is vital for developing and maintaining layers of connection that help partners achieve their goals in the short- and long-term. Through this process, staff from community organizations have expressed the value of having a heightened level of support from institutional staff members who would have the responsibility to see the project through.

Having a full-time CELR staff member who is dedicated to building and maintaining a particular partnership can address challenges linked to project management and the mismatch between the academic calendar and the year-round needs of CBOs. Staff members are available all year round for planning and facilitating projects and have the professional skills necessary to intervene when problems arise with student-led teams. Staff members are also instrumental in finding unique ways for organizations to meet the year-round needs of community partners, including securing full-time AmeriCorps members to supplement the CBOs' staff. Staff can also help identify and organize local TCNJ students interested in volunteering at sites and/or Bonner Community Scholars in need of additional service hours during camps break periods. CELR staff members have also made important contributions to the actual personnel of its community partners. At IYI, the CELR staff member recommended a former Bonner Community Scholar to the position that she now holds with IYI knowing that she had a desire to return to the non-profit sector after a time in a public school system. Another Scholar transitioned directly from being a CELR staff member to the AmeriCorps member assigned to ASA and then to a paid staff position there. Detailed above, the CELR staff members relationship with the administration of TCHS best exemplifies the advantages of having a dedicated staff member working with a community partner, allowing for a variety of positive outcomes for the high school.

In addition, all 3 community partners expressed support for the long-term relationships encouraged by having Bonner Community Scholars serve at the site for up to 4 years. This layer reduces the need for the community partner to "waste" time explaining the purpose of the organization and training new college students each semester. TCNJ Bonner Community Scholars form a critical link directing first-year students into appropriate projects identified during the collaborative partnership planning process, as well as helping to supervise their work. At times, these are simple direct-service projects, such as painting teachers' lounges at TCHS, but they are increasingly course-based projects that enhance the programming at the organization itself, such as providing mentoring coaches at IYI or knowledgeable chaperones for ASA's field trips. In this way, the four-year commitment of Bonner Community Scholars addresses challenges typically associated with short-term service projects.

On-going and long-term relationships with CELR staff and Bonner Community Scholars are also the primary means through which quality is maintained in the partnerships. Faced with uneven quality, ASA worked with its TCNJ team to establish a set of criteria for campus partners to target those who will provide the most consistent support. For example, one criterion was to require a substantial minimum number of on-site contact hours. There are enough faculty members interested in partnering with ASA that it no longer has to accept all requests and can choose partners that best align with its goals and needs. It is also true that the deeper and more sustained the partnership, the more

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likely faculty partners will find community partners who are receptive to developing more complex, sometimes interdisciplinary, projects that can result in publishing opportunities. Finally, the deeper and more valuable the partnership becomes to community partners, the more they may want to invest in building the capacity of TCNJ's CELR Center and its affiliated faculty (e.g., assuming the role of co-educators of TCNJ staff and students, helping campus staff find resources). Ray notes that it is important to create institutional structures and practices where we can listen deeply to community partners.[10] Mechanisms for such listening might take the form of focus groups, community advisory groups or boards, community partner surveys, and community representation on the college or Institutional Review Board (IRB). We agree and add that it is critical to create structures and practices where we can listen deeply to all relevant constituents.

FINAL CONCLUSIONS

This article presents civic engagement in higher education as a process that should consider more than just student learning outcomes. There is clear evidence that student outcomes depend on the quality of these experiences, which in turn depend on the quality of partnerships between relevant campus and community members. Given concerns raised by community partners in the research literature, it is critical for colleges and universities to foster transformational rather than transactional relationships – ones that occur when all parties grow and change because of deeper and more sustainable commitments. In this article, we provide examples in three case studies of how transformational relationships developed between TCNJ and community organizations in Trenton and how multiple layers of connections among all constituencies are necessary to weave the densely woven fabric that sustains successful partnerships. We find that collaborative planning, year-round dedicated staff at the CELR, and shared and leveraged resources (including staff and alumni across all stakeholders) contribute to a partnership that provides unique opportunities for student learning at introductory and advanced levels while building the capacity of the organizations themselves.

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ENDNOTE

On many campuses, the language of "service" has fallen out of favor because of the asymmetry it implies (i.e., doing service for community members). Many institutions have changed the name of service-learning on their campus to a label that connotes more full and equal partnership between campus and community members (e.g., community-engaged learning, social action and integrative learning).

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

CONSENT

The research protocol used in this study was approved by The College of New Jersey's Institutional Review Board (IRB protocol # 860 1138-19). All individuals interviewed in the study provided consent to be interviewed and provided permission for their names and organizations to be included in the article.

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SOCIAL BEHAVIOR RESEARCH AND PRACTICE

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Opinion

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Investigating the Framing Effect in Social and Behavioral Science Research: Potential Influences on Behavior, Cognition and Emotion

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The framing effect has far-reaching implications for our understanding of social psychology and intergroup behavior. In recent decades, the effect garnered considerable attention in the fields of psychology, political science, and communication studies. Whether the effect is demonstrated by repetitious news stories[1] or in voting behavior,[2] framing matters. It matters for both theoretical and pragmatic reasons. We will make connections between framing and politics as a way of illustrating the real world applicability of this effect. The practical relevance of the framing effect is why effectively researching it is so crucial. The purpose of this paper is to propose ways of improving framing research practices. To begin, we will define the framing effect and provide some germane examples in order to clarify the concept.

In general, framing occurs when an issue is presented in such a way that certain features of a topic are made more salient than others; that is, one aspect of the situation tends to standout over all other elements.[3] For example, George W. Bush, the 43rd President of the United States, frequently used the words "tax relief" once he got into office.[4] By framing taxes in this way he made salient their burdensome qualities. In effect, Bush argued, that by cutting taxes a heavy boulder would be lifted off the shoulders of citizens. What a relief! With this approach to framing, the burden of taxes was made apparent while any sort of benefits coming from them were ignored. The point is that by highlighting some parts of an issue and ignoring others a new narrative is formed.

In the context of social and behavioral science research, a frame is "a central organizing idea or storyline that provides meaning to an unfolding strip of events weaving a connection among them. The frame suggests what the controversy is about, the essence of the issue".[5] Simply put, framing creates a storyline by telling us what an issue is fundamentally about. In order to apply our definition of framing in a relevant way, let us briefly examine its role in the 2016 United States presidential race. The manner in which the leading candidates are depicted exemplifies episodic framing. This type of framing occurs when specific instances, or episodes, are highlighted over more broad facts and statistics.[3] Episodic framing makes the storyline about what someone said or did.

For instance, the right-wing conservative Republican Party tends to focus on specific instances in which Hillary Clinton, a Democratic candidate for the presidency "lied." The left-wing Democratic Party emphasizes episodes in which Donald Trump says something "moronic" or comes off as "temperamentally unfit" to be president. Social media, talk radio, and the 24-hour news cycle amplify these narratives. We suggest that these framing strategies will influence the election by shaping people's attitudes and the decisions they go on to make in the voting booth. The use of (episodic) framing has the potential to profoundly shape the future of America. For that reason, it is necessary to gain further understanding of the framing effect and the psychological processes that give it such power. Having demonstrated the relevance of

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the framing effect, and defined it, we can now transition into our central argument concerning research practices.

We propose the use of 4 research practices for furthering the study of framing. First, researchers should adopt an approach that factors in the tremendous social and technological changes that have taken place over the last few decades.[6] Second, those studying the framing effect must consider how to design studies emphasizing both the cognitive and affective components of framing.[3,7] Third, researchers should pay particular attention to the durability of framing effects.[1,8] Fourth, it is essential that researchers design experiments taking into consideration the external validity of their results.[9,10] Ultimately, the goal is to encourage research practices that give us a meaningful and realistic understanding of social behavior in relation to framing. In order to engage in these research practices, we must take into consideration recent social and technological changes.

Research in communication studies has played a major role in furthering our understanding of the framing effect because so much of the information we are exposed to comes from the media. This media exposure invariably has a frame associated with it. Bennett and Iyengar[6] argue that the theoretical underpinnings of mass communications research are out of date; that is, the foundational practices for this research were established at a time when it was hard to imagine technologies such as the internet and smartphones. These technologies have serious implications for how people are exposed to media frames. Tewksbury[11] found that the internet lends itself to news outlets attracting certain segments of the population. This has the effect of fragmenting audiences such that readers and viewers receive specialized presentations of news stories. For instance, the site foxnews.com is a news outlet attracting a particular set of readers that is likely to be distinct from the readers of the satire site theonion.com. Clearly, fragmentation of this kind could not exist without the relatively recent proliferation of online news media.

In addition to audience fragmentation, there is a tendency for people to take in news that reinforces their ideological beliefs thereby creating an echo chamber.[12] As a result, there is increasing polarization of people's ideological views. We are much more polarized and fragmented in our media usage than we were 40 years ago. Our practices for researching framing and mass communications are still based on studies from when television and radio were all there was. We need to explore how the framing effect has changed over the last decade with the now widespread use of social media platforms, smartphones, and the internet. Information and their accompanying frames are not taken in like they used to be. Researchers must adapt. This will entail incorporating both cognitive and affective components into our study of framing.

In a study of episodic and thematic framing, Kimberly Gross[3] notes that there is little research on the affective basis for framing as most of the research centers on its cognitive side. We suggest that the metaphor of the brain as a computer[13] leads us to excessively emphasize the cognitive features of framing. This causes us to make what neurologist Antonio Damasio[13] calls Descartes' Error: Mistakenly believing or acting as though emotions and reason are separate. Of course, we know that affective and cognitive processes are intertwined. However, it is a real test of a researcher's abilities to design studies with this in mind. Consequently, we argue that it is very important to incorporate emotions, and not just cognitive processes, in framing research studies.

Indeed, Nabi[7] found that emotions can act as frames in and of themselves. Nabi points out that if someone experiences an emotion such as fear, that person will process incoming information with escaping danger as the focus. For example, fear tends to affect our behavior whether it is during the presentation of a speech or when making important life decisions. Notice how with the emotion-as-frame approach both affective (fear) and cognitive (differential information processing) components are incorporated into the study. One specific suggestion for furthering an affective-cognitive approach would be to use surveys such as the *Cognitive Emotion Regulation Questionnaire*.[14] Surveys such as this are an efficient way of incorporating both cognitive and affective dimensions into research design. Affective-cognitive surveys allow us to avoid the theoretical pitfall of privileging cognition over emotion. Keep in mind that this is just one of many pitfalls a researcher must avoid in studying framing. The next one is essential if studies are to be of practical importance.

Research on framing should be conducted with durability in mind.[1,8] Given that policy opinions tend to be volatile, time is an important variable to include in our models.[10] We may want to know if the framing effects actually last for a significant amount of time or just fade into obscurity. The pitfall here is not factoring in time. In other words, it is a mistake to conduct research with a one-off frame exposure and measurement of the dependent variable. Exposure to a frame only one time may be of little practical significance in terms of changing people's attitudes or behaviors.[15] For example, a person is exposed to a frame then immediately forgets it because of an abundance of technological distractions. In this situation, the frame exposure is inconsequential because it lacks the necessary durability to have behavioral ramifications. Accordingly, studies that are designed to have a one-off frame exposure are questionable from the standpoint of pragmatism. Thankfully, there are intriguing studies that have avoided the one-off mistake. For instance, Lecheler, Keer, Schuck, and Hänggli[1] found that political knowledge moderated the relationship between repeated exposure to a frame and the durability of attitudes. People with moderate knowledge of politics were most prone to having their views changed in an enduring manner when repeatedly shown a particular frame.

As an important side note, their use of a moderator, political knowledge, is a strength in their research design. When moderators or mediators are included, results more accurately

represent the complexity of psychological phenomena. In effect, many factors contribute to framing so moderation and mediation analyses are necessary at times. Researchers may shy away from the inclusion of these variables because it makes the theoretical justification for their designs more difficult. Furthermore, the statistical analysis is substantially more complex when moderators and mediators are included. Researchers may be prone to excluding these variables from their models because factoring them in is a hassle. In the final analysis however, research must be done is such a way that attempts doing justice to the world in all its complexity. Failing to do so makes results in framing research suffer from a lack of external validity. This is problematic because framing studies should be conducted in as externally valid a manner as possible.[9,10]

Let us consider some practical suggestions for enhancing the external validity of framing studies. Chong and Druckman[15] argue that participants should be exposed to competing frames on an issue. For example, show participants a frame in favor of farm subsidies and another against them. These two frames, in favor and against, are competing with one another to define the "essence of the issue".[5] We are regularly exposed to competing frames in this manner; just turn on the nightly news to watch an endless stream of it. These competing frames may be diametrically opposed to your stance on an issue. For instance, you might find yourself gravitating towards those favoring one particular political candidate**.** Inevitably, you would hear about another candidate you do not like from a relative on your Facebook newsfeed. This example demonstrates that exposure to competing frames is a part of the fast-paced information age we live in.

Indeed, the information age has led many of us to be in a constant state of distraction.[16] On this point, Kinder[9] criticizes framing studies for guaranteeing that participants are directly exposed to frames. This type of direct exposure is uncommon in everyday life. Realistically, given the widespread use of modern communication technologies, people are in a rather passive and distracted state when they take in frames. Consider that even the mere presence of a cell phone has a unique ability to distract us.[17,18] The smartphone is an innovation that has changed the manner in which we are exposed to frames. This connects with Bennet and Iyengar's[6] argument that the theoretical underpinnings of framing research have fallen behind changes in technology. Researchers may conduct studies with low external validity because their theoretical *assumptions* are derived from a (technological) environment that no longer exists. With these misguided assumptions, one cannot help but question our supposed knowledge of framing effects.

We may have misrepresented the framing effect because of experimental manipulations lacking in external validity. In framing research, participants typically read texts describing how one *rationally justifies* their stance on an issue.[9] In other words, the frames used in manipulations are cognitively oriented and logical. This has its place, but we must not forget that framing can take on a multitude of forms. Kinder notes that framing includes "metaphors, exemplars, catchphrases, visual images, rhetorical flourishes, and justifications through appeals to principle".[9] These approaches lend themselves well to more emotionally oriented appeals. Given the excessive emphasis placed on the cognitive components of framing, it comes as no surprise that these approaches have received little attention despite their ubiquity. Ultimately, our experimental manipulations need to more closely match the wide variety of frames used in mass communications. In doing so we will help realize what has been the goal of this paper, to advance framing research practices.

To make our case for improving framing research practices we stressed social and technological changes, research emphasizing cognitive and affective components, durability, and external validity. Indeed, there are many other commendable research practices. However, these four are most relevant and salient to us. They standout because we see them as especially crucial for understanding the fascinating phenomena that is framing. Even beyond its intrigue, we can see how framing is a vital construct to understand. Consider, for example, our constant exposure to frames throughout the day and the inextricable connection between information and frames. Notice that it is difficult, if not impossible, to present information without highlighting some elements over others. The act of including information *necessitates* exclusion of other information. Therefore, frames cannot help but be ubiquitous and have an unceasing impact on the psyche. In our opinion, this is the strongest theoretical argument for the importance of framing research. There is also the more concrete and practical observation that framing is a strategic part of the United States presidential race. In sum, framing is eminently relevant to politics and social behavior, while remaining a profound construct from a theoretical standpoint. In light of this, not conducting methodologically sound framing research would mean to miss out on understanding a construct more meaningful than we give it credit for.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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