Impact of Test-Taking Setting on Conformist-Negativistic States and Measures

Mikaela Bevan & Kenneth M. Cramer
University of Windsor

The rules domain from reversal theory describes how conformist and negativistic metamotivational states can affect how we perceive a given situation. The purpose of this study was to examine whether the setting where participants completed a questionnaire impacts their conformist-negativistic states and/or their associated measures (both via mean differences or enhanced internal consistency). Participants were 88 university students, randomly assigned to one of three testing conditions: (1) online participants completed the questionnaire package (consisting of four conformity measures) via the internet at a self-selected location; (2) on site alone participants completed the package on a solitary campus computer; and (3) on-site-group participants completed the package on a computer alongside other participants. All four conformity measures performed adequately ($\alpha > .67$) when tested in a group setting; however, there were no significant mean differences by setting. Directions for future research are discussed.

Keywords: reversal theory, conformist-negativistic states, conformist-negativistic measures, rules domain

More research is being conducted online, in part because of the numerous opportunities from which researchers may benefit, including lower costs and ease of recruiting large samples (Kraut et al., 2004; Paolacci, Chandler, & Ipeirotis, 2010). But to what extent does the online scenario impact the final results? Specifically, will research results prove resistant to data collection methods (whether implemented at home vs. on campus vs. online)? One wonders about the impact of this response bias – that is, participants may respond uniquely when answering questions about themselves in the comfort of their home compared to an unfamiliar lab setting surrounded by strangers (Bowling, 2005). If there is indeed a difference, what might motivate the change in participant responding? The present study looks to answer these questions. However, a further vein of investigation may be suggested in the context of reversal theory, since (with respect to one particular meta-motivational state) participants may be more likely to conform in the presence of others (rather than online). Thus, we aim presently to compare the psychometric properties (via both means and reliability analyses)

for a variety of conformity-negativistic state measures across different contexts.

Reversal theory (Apter, 1984, 1989, 2013; Kerr, Murgatroyd, & Apter, 1993) explains that differences in one's behavior and emotions experienced during various everyday events are caused by entry into different metamotivational modes or states. These domains include: the means-end domain, the rules domain, the transactions domain, and the relationships domain. More precisely, the particular metamotivational state we experience will influence how we interpret events, sensations, and emotions (Lachenicht, 1988). Of interest presently is the rules domain, which encompasses the negativistic ('rebellious') vs. conformist states. Within the negativistic state, one aims to do something that is different from what is wanted by someone or a group of people (thought to be more powerful). The absence of this feeling is attributed to the conformist state, characterized by a willingness to comply (Apter, Kerr, & Cowles, 1988; McDermott, 1987, 1988a). Of course, a conformist state does not always equate to socially approved behavior (e.g., mob looting and violence), and a negativistic state does not always equate to socially disapproved behavior (e.g., nonviolent dissent to authority).

As antecedents to metamotivational reversals, and in addition to both frustration and satiation, Apter (2007) identified a situation's contingency as a relevant factor. Contingencies include the context or situation – like a fire alarm rendering a telic state and its cessation rendering a paratelic state; however, contingencies also include setting (Jung, Min, &

Mikaela Bevan, Department of Psychology, University of Windsor; Kenneth M. Cramer, Department of Psychology, University of Windsor.

Correspondence concerning this article should be addressed to Kenneth M. Cramer, Department of Psychology, University of Windsor, Windsor, ON, CANADA, N9B 3P4. E-mail: KCramer@UWindsor.ca

Martin, 2017). The present study explores the latter, namely the impact of the research setting on metamotivational modes and reversals, and how the test-taking environment might impact participants' state and so too their thoughts, feelings, and behavior. To place this in a wider context, Kerr and Tacon (1999) found that when having participants enter telic or paratelic locations, they observed significant differences in their scores on a telic-paratelic measure, suggesting the telic location (viz. a university library or a lecture theatre prior to the start of a statistics lecture) induced a telic state, whereas the paratelic location (viz. a university sports centre or a party in the student union building) induced a paratelic state. During a lecture, Kerr and Tacon (2000) similarly had students complete a telic-paratelic measure before and after an unexpected break, and found that students were more likely to be in the paratelic state after the unexpected break. In a related study, Kerr, Hayashi, Matsumoto, and Miyamoto (2002) reported that when placing individuals in various settings representing different combinations of states and arousal levels, it yielded differences in participants' mean scores across a telic-paratelic measure. When placing participants in the same setting but giving them different environmental tasks to do, it similarly produced reversals in respondents' telic-paratelic states.

In a field study, Kerr et al. (2006) examined the responses from recreational vs. competitive runners in either a laboratory or natural environment. Within the natural environment, recreational runners reported higher pride post-running, whereas competitive runners reported greater tension and effort. Similarly, Males, Kerr, and Gerkovich (1998) found that the metamotivational state (e.g., telic conformity, autic mastery, telic negativistic) of participants in a slalom competition changed in the course of the competition as a function of external events experienced during the race. A study conducted by Walters, Apter, and Svebak (1982) examining color preference, arousal, and reversals found that long-wavelength colors induced feelings of high arousal whereas short-wavelength colors induced feelings of low arousal; therefore, an environmental aspect as simple as color has the ability in influence how we feel. Another study examining the role of the environment (Bindarwish & Tenenbaum, 2006) found individuals in different telic vs. paratelic states were affected uniquely by the environment (viz. throwing darts from a long vs. short distance, and feedback concerning whether the participant won or lost the game). More precisely, compared to paratelic individuals, telic individuals associated the short throwing distance with more pleasant feelings. The authors concluded that more research was needed on the interplay between environmental and metamotivational states. Finally, Bellew and Thatcher (2002) examined the factors affecting reversals between telic and paratelic inductions for male rugby players, and concluded that elements in the environment was the most common reason for a reversal to the opposing metamotivational state.

As a unique environmental aspect, the present study focused on assessment of conformist vs. negativistic states via the internet. Abildgaard (1999) found that questionnaires administered online (rather than in-person) produced lower social desirability and impression management scores. Indeed, Bateman, Pike, and Butler (2011) reported that perceived publicity (or availability for public viewing) of a social networking site negatively influenced users' self disclosure intentions, suggesting that anonymity affects one's willingness to disclose information (Myers & Smith, 2015). Rains (2014) too found that higher levels of anonymity were positively associated with levels of self-disclosure among bloggers with illness-related embarrassment. The literature suggests that anonymity – produced keenly within the online setting – affects individuals' willingness to disclose information, which in turn impacts their social desirability responding (cf. Jones' & Sigall's, 1971 development of the bogus pipeline to enhance authentic responding).

Apter (2013) notes that, compared to the telic/paratelic domain, there are relatively fewer studies examining the rules domain of reversal theory, fewer measures to assess those states, and little research to evaluate those measures. There are several notable scales in use today. To begin, McDermott (1987) created the *Rebelliousness Questionnaire* to assess proactive dominance (i.e., an individual seeks out rebelliousness for pleasure's sake) and reactive rebelliousness dominance (i.e., an individual responds to a disappointment, frustration, or insult). Though this scale measures two kinds of rebelliousness, a low score on this measure necessarily indicates conformity (McDermott, 1988b). So too, Apter, Mallows, and Williams (1998) created a negativism-conformity subscale as embedded in the *Motivational Style Profile* (MSP). However, Lafreniere, Menna, and Cramer (2013) showed that both measures demonstrated poor internal consistency, prompting a need for improved psychometrics within the rules domain. Finally, regarding state measures, Del Pup (2014) developed a 15-item instrument that still requires more rigorous psychometric validation, and Cook, Gerkovich, Potocky, and O'Connell (1993) developed the 4 item *Reversal Theory Instrument* to assess the negativistic-conformist states.

Present Study and Hypotheses

In sum, the present study examined whether the survey completion setting impacted (a) the likelihood that respondents would be in a conformist or negativistic state, (b) the reliability estimates of the conformity/negativistic scales, and (c) the external validity of conformist-negativistic dominance and state measures. We compared participants' scores and reliability estimates when a questionnaire package was administered in one of three test-taking settings: online

(completed at their own computer), in-person-alone (completed at a solitary campus computer), or in-person-group (completed in a campus computer lab among other co-acting participants). We advanced the following hypotheses:

(1) Based on the research of Kerr and Tacon (1999, 2000) and Kerr et al. (2002), who found that survey completion setting affected respondents' telic and paratelic states, we expected to observe significantly lower levels of conformity for participants completing the survey alone (either on campus or at home online) compared to those completing the survey among others. In other words, the presence of other participants would socially facilitate greater conformity based on group norms and social pressure.

(2) Moreover, based on the research of Abildgaard (1999) and Bateman et al. (2011), who found surveys completed online contained less socially desirable and impression managed responses but more intimate self-disclosure, we expected to observe (2) significantly lower levels of conformity among participants completing the survey online compared to those completing the survey on campus (either alone or among others). Survey completion online (without a researcher or fellow students present) should lead to decreased levels of conformity and increased levels of negativism.

Finally, the present study advanced several research questions to determine if survey setting impacted reliability estimates of the scales. It is feasible that conformity scales completed online would be more reliable compared to either of the two in-person conditions (alone or in a group). This is thought to occur because the participants would theoretically be answering more honestly and perhaps less distractedly, which may lead to more consistent answers. Moreover, participants in either the in-person-alone and in-person-group conditions may be affected differently by the pressure of each of the on-site location, an on-site researcher, and the group of other participants (in the in-person-group condition), and this may lead to more inconsistent answers. Additionally, we compared participants' state and dominance measures of conformity, since one might anticipate only a modest correlation between the two. That is, state measures (assessed moment to moment) would overlap on occasion with a dominance assessment.

Methods

Participants, Measures, and Procedure

Participants were 59 female and 29 male students (average age = 21 years) registered with the Departmental Participant Pool who received 0.5 bonus points towards an eligible class; they were randomly assigned to complete the questionnaire package in one of three test-taking settings: online ($n = 30, 67\%$ female), on-site-alone ($n4 = 30, 67\%$ female), and on-site-group ($n = 28, 68\%$ female). For the overall sample, 57 were White/Caucasian, 12 Asian, 7 Black,

7 Middle Eastern, 3 Indian, and 2 Latino. Participants first completed a demographics questionnaire to track age, gender, ethnic/cultural group, year in university, marital and employment status, and current living situation. Participants then completed a package of conformity scales (delivered in a randomized order) plus at the end a measure of social desirability.

The *Conformity-Negativism Scale* (CNS; Del Pup, 2014) consists of 15 items assessing negativism and conformity dominance. Although the scale (across all conditions) showed poor initial reliability ($\alpha = .435$), it rose to near-acceptable levels ($\alpha = .569$) when four problematic items were removed. The CNS is a forced-choice scale ("Most of the time" vs "Hardly ever") when scored next to participants' endorsement of how they would act in various everyday situations. Higher overall scores reflect greater negativism.

The *Conformity-Negativism Scale – State Version* (CNS-SV, AUTHORS) consists of 15 items assessing participants' negativism-conformity states. The scale is a modification of the Del Pup (2014) instrument that altered the items to reflect respondents' current state. For example, the item "I comply with rules and regulations set for me" was changed to "At this moment, I want to comply with rules and regulations set for me." Similarly, higher scores reflect greater negativism. Alpha coefficients in the present study ranged (by condition) from .58 to .93. As supporting evidence of construct (convergent) validity, the CNS-SV correlated significantly with each of the CNS, RQ, and RTI ($p < .05$).

The *Rebelliousness Questionnaire* (RQ; McDermott, 1987; formerly known as the 'Negativism Dominance Scale') consists of 18 items that assess proactive and reactive rebelliousness. The RQ items have 3-options: 0 (not rebellious), 1 (not sure), and 2 (rebellious); higher scores reflect greater rebelliousness. Researchers report reasonable concurrent validity, and somewhat low internal consistencies (Griffin & McDermott, 1998; Klabbers et al., 2009; Lafreniere et al., 2013; McDermott & Barik, 2014).

The *Reversal Theory Instrument* (RTI; Cook et al., 1993) consists of 12 items with three subscales (4-items each) assessing playfulness, arousal seeking, and negativistic states. For the present study, only the four items assessing the negativistic state were used. Each item is a bipolar rating scale with a negativistic statement at one (higher) end and a conformist statement at the other (lower) end. Participants respond to each item: "indicate which statement best describes you *at this moment*" based on the scale '1 = complete conformity' to '6 = complete rebelliousness'; higher scores indicate greater negativism. The scale offers acceptable internal consistency ($\alpha = .75$); indeed, Cook et al. (1993) compared the instrument to the Metamotivational State Coding Schedule (an interview method of assessing metamotivational states) and concluded the RTI had promising validity but needs further validation.

Table 1
Means, Standard Deviations, Reliabilities, and Inter-Correlations of Conformity-Negativism Measures (N = 88)

	Measures Online (n = 30)					On-Site/Alone (n = 30)					On-Site/Group (n = 28)				
	CNS	CNSsv	RQ	RTI	SDS	CNS	CNSsv	RQ	RTI	SDS	CNS	CNSsv	RQ	RTI	SDS
CNS	—					—					—				
CNSsv	.37	—				.19	—				.73	—			
RQ	.42	.49	—			.25	.39	—			.71	.53	—		
RTI	.41	.74	.51	—		.22	.47	.37	—		.64	.34	.72	—	
SDS	n.s.	n.s.	-.59	n.s.	—	n.s.	n.s.	n.s.	n.s.	—	n.s.	n.s.	n.s.	n.s.	—
Mean	1.84	3.85	15.2	3.27	16.0	1.29	2.82	15.6	3.21	15.2	2.20	4.27	14.9	2.27	15.1
SD	1.26	3.87	7.94	2.55	5.47	1.24	2.94	6.85	2.92	4.94	1.94	5.48	8.54	2.89	4.63
α	0.36	0.79	0.77	0.38	0.70	0.40	0.58	0.64	0.76	0.78	0.70	0.93	0.80	0.67	0.70
z	*	**	—	***	—	*	**	—	***	—	*	**	—	—	—

Note. Correlations above ± 0.35 are significant at $p < .05$.

Reliabilities for SDS are reported as KR-20 statistics.

* CNS reliabilities are marginally different by setting ($p < .082$; Group > Online = Alone)

** CNS-sv (State Version) reliabilities are different by setting ($p < .05$; Group > Online > Alone)

*** RTI reliabilities are different by setting ($p < .05$; Group > Online)

Finally, the *Marlowe-Crowne Social Desirability Scale* (SDS; Crowne & Marlowe, 1960) consists of 33 true-false items assessing social desirability, where higher scores indicate socially-desirable responding. It boasts strong internal consistency (KR-20 = .88) with compelling evidence of external validity as seen in significant correlations with the Edwards Social Desirability Scale and the Minnesota Multiphasic Personality Inventory (Crowne & Marlowe, 1960).[1]

The study was conducted either online and in-person at a computer station (whether alone or with other co-actors). Participants were recruited through the psychology department participant pool website, and randomly assigned to one of three test settings: online, on campus but alone, and on campus in a group of five fellow participants.

Results

Using a significance level of .05 for all statistical tests, Table 1 shows the means, standard deviations, and reliability coefficients for each of the four scales by condition. An analysis of variance – with setting (online, alone, group) as the categorical factor and the four conformity measures as the dependent variables – showed no significant differences in levels of respondent conformity ($p > .05$); we will note a marginal difference in conformity levels when comparing CNS mean scores between online and on-site-alone respondents, $t(58) = 2.29, p = .0544$. However, a different picture emerged when we examined the scale reliabilities by condition. Inspection of the inter-scale correlations of the scales showed a modest overall average correlation when participants were tested alone (average inter-correlation = .315), moderate when tested online (r_{avg} = .490), but high when tested in a group (r_{avg} = .612). Inspection of the scale reliabilities across all four scales shows

near-acceptable to impressive reliabilities when conducted in a group ($.93 > \alpha > .67$); lower reliabilities when conducted online ($.78 > \alpha > .40$), and still lower reliabilities when conducted alone ($.79 > \alpha > .36$).

Following the deletion of items 1, 5, 8, and 11 based on psychometric misbehavior (i.e., low item-total correlations and increased reliability following item deletion), the CNS still showed unacceptably poor reliability in both the online and on-site-alone conditions ($\alpha = .36$ and $.40$, respectively), but the reliability improved substantially among the on site group ($\alpha = .70$). A 1-tailed Fisher-Bonett Test (Kim & Feldt, 2008) was used to evaluate the difference in independent-sample reliabilities, and indicated the CNS was marginally more reliable when conducted in a group rather than either alone ($z = 1.53, p = .08$) or online ($z = 1.39, p = .06$).

Similarly, after deleting items 1, 3, 7, 11, and 15 from the CNS-SV (for psychometric misbehavior), the unacceptable reliability estimate (when conducted on-campus-alone, $\alpha = .58$) improved significantly when conducted online ($\alpha = .79, z = 1.74, p < .05$); however, scale reliability was highest when administered in a group ($\alpha = .93$), compared to administration online ($z = 3.46, p < .05$) or alone ($z = 2.08, p < .05$).

The RQ was reasonably invariant across test-taking settings ($p > .05$), with acceptable reliabilities both online and alone ($\alpha = .77$ and $.80$, respectively), and slightly though not significantly lower reliability when tested in a group

---

[1] Although we had originally included the Reversal Theory State Measure, Bundled Version (Desselles, Murphy, & Theys, 2014) in our testing package of instruments, our analysis showed an insufficient degree of subject variance, inhibiting our ability to make useful comparisons to other scales; this scale was subsequently dropped from analysis.

($\alpha = .64$). Of note in the online condition was the significant negative correlation with social desirability, $r(28) = -.59, p < .05$; suggesting the RQ may be sensitive to respondents' attention to social cues and conventions. Finally, the RTI (with item-3 deleted) showed significantly better reliability when conducted alone vs. online ($\alpha = .76$ and $.38$, respectively; $z = 1.98, p < .05$), but no different when conducted in a group ($\alpha = .67$).

Finally, in an evaluation of our final research question concerning state vs. dominance measures, we identified a key difference by group. As expected, both state measures (CNS-SV and RTI) were more highly inter-correlated in both the online ($r = .74$) and onsite-alone ($r = .47$) condition, compared to markedly lower correlations of these two instruments to the dominance measures. That relation flipped however in the onsite-group condition, where the state inter-correlation was lower ($r = .34$) compared to the state-dominance correlations.

Discussion

Each year sees a greater proportion of research conducted in an online environment, which prompts us toward determining empirically if the setting in which participants complete these surveys directly impacts the overall results. The research questions addressed presently were two-fold: would test-taking setting impact (a) state levels and (b) resultant scale reliabilities? Given the nature of conformity in the typical on-site research setting, this study focused on the conformist-negativistic domain in an effort to explain any mean or reliability differences among scales (Kerr & Tacon, 1999, 2000; Kerr et al., 2002).

We hypothesized that the absence of the experimenter and other participants (coupled with a self-selected location) would invite online respondents toward a negativistic state; and further hypothesized that respondents completing the survey on campus with an on-site researcher – either alone or in a group – would prompt respondents toward a conformist state. These hypotheses were not confirmed, given that we observed no significant mean differences across the three response settings (online, alone, and group) for any of the four conformity-negativism instruments. It should be noted that, according to all four scales, respondents were in a conformist state.

The results did however support our second research question, which advanced that scale reliabilities would be enhanced in a group (rather than a solitary) test-taking setting. Overall, all four scales performed reasonably better in the group setting than either online or alone. The key exception was the RTI, which performed significantly better when completed on campus (either alone or in a group) rather than online. The reason behind this differential reliability remains unclear since all three state measures indicated a conforming state among the participants. Although the present study does not offer definitive evidence that the test-taking situation affects conformist-negativistic states (cf. telic-paratelic states; see Bellew & Thatcher, 2002; Kerr & Tacon, 1999, 2000; Kerr et al., 2002), these results suggest that the impact of respondent setting in the conformist-negativism domain may be more relevant for respondents to be more attentive to the constituent scale items and yield higher scale reliabilities.

Both the original and state versions of the CNS instruments required deletion of approximately one third of their constituent items in order to achieve a suitable reliability level, and exclusively in the on-site/group condition. Researchers would do well to question the remaining content validity of the truncated instruments following those needed modifications. So too, both tools demonstrated moderate to high inter-scale correlations, suggesting they both reside in the same universe of items to assess feelings of conformity and negativism. The key change in the updated CNS-SV included the phrase: 'at this moment' to preface comparable questions as found in the CNS (Del Pup, 2014). At this point, and based on limited data, we are unable presently to recommend an overhaul of either instrument; but perhaps rather we encourage scale developers to cast the universe of items using a wider net.

Potential limitations of this study include the number of participants recruited; and inequalities in each of ethnic, gender, and age. To begin, the study had 88 participants in total, 65% of who were White/Caucasian, limiting the ability of the study to generalize with the variety of ethnicities in the general population. This study also cannot be generalized to all genders since 72% of the participants were female. All of the participants involved with the study were also university students with an average age of approximately 21 years, arguably not fully representative of the general population (but more typical of an undergraduate sample). We urge future researchers as well to establish a common task prior to implementing the experimental conditions so as to control the nature of the activity immediately prior to the study.

The results from this study suggest that collecting data through online platforms does not appear to impact the mean levels of reported conformity and negativism; but rather may shed doubt on the internal consistency of the component items. Test-taking on-site and in a group among participant co-actors may add focus to respondents' attention on the task at hand, a process from social psychology called 'social facilitation' – wherein the presence of others relaxes us and our performance, at least on relatively simple tasks, is enhanced (Myers & Smith, 2015). It begs the question as to whether the reliabilities of other domain-specific measures (e.g., telic/paratelic, or autic/alloic, or sympathy/mastery) are enhanced or impaired depending upon test-taking setting. Future research would do well to include within this research protocol additional control groups, such as participants completing the scales without the assistance of a computer. Ad-

ditionally, future researchers could further have the same group of participants take a questionnaire online and then in-person in small groups – since most researchers would not practically have the time or resources like incentives to conduct single-participant sessions (see the meta-analysis by Schwarz, 1999).

In sum, this study contributed to the broader literature by scrutinizing the effects of the manner in which research data are collected and the impact therein; researchers would do well to question the merits of their test setting for other instruments used. This study also contributed to the literature on reversal theory by continuing much needed research on state and dominance measures of conformist-negativistic modes that will hopefully stimulate more research to come.

References

Abildgaard, A. (1999). Level of anonymity and its relationship to socially desirable responding (impression management). *Dissertation Abstracts International: Section B: The Sciences and Engineering, 60*(5-B), 23-26.

Apter, M. J. (1984). Reversal theory and personality: A review. *Journal of Research in Personality, 18,* 265-288. doi: 10.1016/0092-6566(84)90013-8

Apter, M. J. (1989). Reversal theory: A new approach to motivation, emotion and personality. *Anuario de PsicologÎˉa, 42*(3), 17 29.

Apter, M. J. (2007). *Reversal theory: The dynamics of motivation, emotion, and personality* (2nd ed.). Oxford: Oneworld Publications.

Apter, M. J. (2013). Developing reversal theory: Some suggestions for future research. *Journal of Motivation, Emotion, and Personality, 1,* 1-8.

Apter, M. J., Kerr, J. H., & Cowles, M. (Eds.), (1988). *Progress in reversal theory.* Amsterdam: North-Holland (Elsevier).

Apter, M. J., Mallows, R., & Williams, S. (1998). The development of the Motivational Style Profile. *Personality and Individual Differences, 24,* 7-18.

Bateman, P. J., Pike, J. C., & Butler, B. S. (2011). To disclose or not: Publicness in social networking sites. *Information Technology & People, 24*(1), 78-100. doi: 10.1108/09593841111109431

Bellew, M., & Thatcher, J. (2002). Metamotivational state reversals in competitive sport. *Social Behavior and Personality, 30*(6), 613-624. doi: 10.2224/sbp.2002.30.6.613

Bindarwish, J., & Tenenbaum, G. (2006). Metamotivational and contextual effects on performance, self-efficacy, and shifts in affective states. *Psychology of Sport and Exercise, 7*(1), 41-56. doi: 10.1016/j.psychsport.2005.04.001

Bowling, A. (2005). Mode of questionnaire administration can have serious effects on data quality. *Journal of Public Health, 27,* 281-291.

Cook, M. R., Gerkovich, M. M., Potocky, M., & O'Connell, K. A. (1993). Instruments for the assessment of reversal theory states. *Patient Education and Counseling, 22*, 99-106.

Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology, 24*(4), 349-354.

Del Pup, C. (2014). *Developing a new measure of conformity and negativism* (Unpublished undergraduate thesis). University of Windsor, Windsor, Canada.

Desselles, M. L., Murphy, S. L., & Theys, E. (2014). The development of the Reversal Theory State Measure. *Journal of Motivation, Emotion, and Personality, 2*(1) 10-21. doi: 10.12689/jmep.2014.202

Griffin, M., & McDermott, M. R. (1998). Exploring a tripartite relationship between rebelliousness, openness to experience & creativity. *Social Behaviour & Personality*, *26*(4), 347-356. doi: 10.2224/sbp.1998.26.4.347

Jones, E. E., & Sigall, H. (1971). The bogus pipeline: A new paradigm for measuring affect and attitude. *Psychological Bulletin 76*(5), 349-364.

Jung, J. M., Min, K. S., & Martin, D. (2017). The role of reversal theory in digital advertising. In S. Rodgers and E. Thorson (Eds.), *Digital advertising: Theory and research* (3rd ed.), pp. . New York: Routledge.

Kerr, J. H., Fujiyama, H., Sugano, A., Okamura, T., Chang, M., & Onouha, F. (2006). Psychological responses to exercising in laboratory and natural environments. *Psychology of Sport and Exercise, 7*(4), 345-359. doi: 10.1016/j.psychsport.2005.09.002

Kerr, J. H., Hayashi, T., Matsumoto, M., & Miyamoto, N. (2002). The influence of settings and environmental events of metamotivational state and arousal: Further tests of reversal theory on Asian samples. *Journal of Environmental Psychology, 22*(4), 361-367.

Kerr, J. H., Murgatroyd, S. J., & Apter, M. J. (Eds.). (1993). *Advances in reversal theory*. Netherlands: Swets & Zeitlinger Publishers.

Kerr, J. H., & Tacon, P. (1999). Psychological responses to different types of locations and activities. *Journal of Environmental Psychology, 19*(3), 287-294.

Kerr, J. H., & Tacon, P. (2000). Environmental events and induction of metamotivational reversals. *Perceptual and Motor Skills, 91*(1), 337-338.

Kim, S., & Feldt, L. S. (2008). A comparison of tests for equality of two or more independent alpha coefficients. *Journal of Educational Measurement, 45*(2), 179–193. doi: 10.1111/j.1745-3984.2008.00059.x

Klabbers, G., Bosma, H., van den Akker, M., van Boxtel, M. P., Kempen, G. I., McDermott, M. R., & van Eijk, J. T. (2009). Measuring rebelliousness and predicting health behavior and outcomes: An investigation of the construct

validity of the Social Reactivity Scale. *Journal of Health Psychology, 14*(6), 771-779.

Kraut, R., Olsen, J., Banaji, M., Bruckman, A., Cohen, J., & Couper, M. (2004). Psychological research online: Report of board of scientific affairs' advisory group on the conduct of research on the internet. *American Psychologist, 59*(2), 105-117. doi: 10.1037/0003 066X.59.2.105

Lachenicht, L. (1988). Critical introduction to reversal theory. In M. J. Apter, J. H. Kerr, & M. P. Cowles (Eds.), *Progress in reversal theory* (pp. 1-42). Amsterdam: Elsevier.

Lafreniere, K. D., Menna, R., & Cramer, K. M. (2013). Rebelliousness, effortful control, and risky behaviour: Metamotivational and temperamental predictors of risk-taking in older adolescents. *Journal of Motivation, Emotion, and Personality, 1,* 17-26.

Males, J. R., Kerr, J. H., & Gerkovich, M. M. (1998). Metamotivational states during canoe slalom competition: A qualitative analysis using reversal theory. *Journal of Applied Sport Psychology, 10*(2), 185-200. doi: 10.1080/10413209808406387

McDermott, M. R. (1987). *Rebelliousness in adolescence and young adulthood* (Unpublished doctoral thesis) University of Wales, Cardiff.

McDermott, M. R. (1988a). Measuring rebelliousness: The development of the Negativism Dominance Scale. In M. J. Apter, J. H. Kerr, & M. P. Cowles (Eds.), *Progress in reversal theory* (pp. 297-312). Amsterdam: Elsevier.

McDermott, M. R. (1988b). Recognising rebelliousness: The ecological validity of the Negativism Dominance Scale. In M. J. Apter, J. H. Kerr, & M. P. Cowles (Eds.), *Progress in reversal theory* (pp. 313-325). Amsterdam: Elsevier

McDermott, M. R., & Barik, N. B. (2014). Developmental antecedents of proactive and reactive rebelliousness: The role of parenting style, childhood adversity, and attachment. *Journal of Motivation, Emotion, & Personality, 2,* 22-31.

Myers, D. G., & Smith, S. M. (2015). *Exploring social psychology* (4th Cdn ed.). Toronto: McGraw-Hill Ryerson.

Paolacci, G., Chandler, J., & Ipeirotis, P. G. (2010). Running experiments on Amazon Mechanical Turk. *Judgment and Decision Making, 5,* 411-419.

Rains, S. A. (2014). The implications of stigma and anonymity for self-disclosure in health blogs. *Health Communication, 29*(1), 23-31. doi: 10.1080/10410236.2012.714861

Schwarz, N. (1999). Self-Reports: How the questions shape the answers. *American Psychologist, 54*(2), 93-105. doi: 10.1037/0003-066X.54.2.93

Walters, J., Apter, M. J., & Svebak, S. (1982). Color preference, arousal, and the theory of psychological reversals. *Motivation and Emotion, 6*(3), 193-215.