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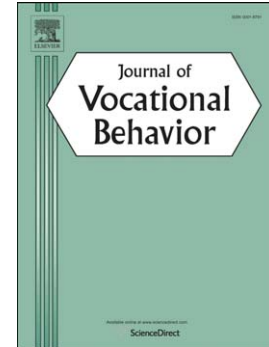
Engagement within occupational trainees: Individual difference predictors and commitment outcome

Maura J. Mills Ph.D., Clive J. Fullagar Ph.D.

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Individual Difference Predictors and Commitment Outcome**

Maura J. Mills, Ph.D.
University of Alabama
Department of Management
165 Alston Hall
361 Stadium Drive, Box 870225
Tuscaloosa, AL 35487-0225
(516) 937-8090
mjmill@culverhouse.ua.edu

Clive J. Fullagar, Ph.D.
Kansas State University
Department of Psychology
492 Bluemont Hall
1100 Mid-Campus Drive
Manhattan, KS 66506-5302
(785) 532-0608
fullagar@ksu.edu

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Keywords: engagement; motivation; occupational commitment; need for achievement; structural equation modeling; vocational education and training

Abstract

The present study examines occupational entrants' experiences of their vocational training, its relation with relevant internal characteristics, and its proposed impact on commitment to the profession. Particular focus is paid to trainees' engagement, hypothesizing motivation and self-efficacy as predictors, and occupational commitment as a distal outcome. Data were from 247 recent entrants into professional degree programs (architecture, engineering). All hypothesized predictive relations were supported, such that motivation (as both a composite and as solely intrinsic) and self-efficacy are predictive of engagement, and engagement is predictive of occupational commitment among early-stage trainees. Further, engagement partially mediated the relation between self-efficacy and commitment, and fully mediated the relation between motivation and commitment. Squared multiple correlations for endogenous variables indicated substantial variance in engagement and commitment accounted for by their respective predictors. Moreover, two structural equation models were examined and compared, proposing more holistic nomological nets for how these constructs fit together. A respecified model accounting for a sole focus on intrinsic motivation and a direct path between motivation and commitment was an excellent fit, superseding a competing model conceptualizing motivation as a composite and only an indirect motivation–commitment path. Finally, need for achievement moderated the relation between motivation and engagement such that the relation is stronger for individuals high in need for achievement than it is for those low in the desire to grow in their profession. The study contributes to our understanding of how early occupational trainees' experiences of work and individual characteristics impact their commitment to their intended profession.

Engagement within Occupational Trainees:

Individual Difference Predictors and Commitment Outcome

The rise of positive organizational behavior (Luthans, 2002) has led to a greater focus on related constructs such as work engagement, and this is true in both the realms of the workplace, as well as the educational classrooms and experiences preparing people for those workplaces (e.g., Kezar & Kinzie, 2006). However, despite evidence that engagement has a positive effect on learning (Fredricks, Blumenfeld, & Paris, 2004), little attention has been paid to engagement and its correlates at the intersection of those two realms: the education and training of those entering professional occupations. Likewise, researchers (e.g., Rothman, 2003; Saks, 2006) have argued that further inquiry into engagement and its antecedents is needed in general, but especially within the domain of academic training. Nevertheless, despite engagement having been explored as a mediator in several models, Rothman (2003) argued that many more such models are needed to better understand the nomological net within which engagement functions. Saks (2006) echoed this contention, but more specifically emphasized the need for academically-oriented engagement models to ascertain the role that engagement plays in preparing future workers for their intended professions. Notably, this need goes beyond Astin's (1984) theory of student involvement, which – while relevant to the extent that it recognizes both the psychological and physical energy necessary for successful pursuit of academic goals – is more targeted toward an overall student experience in the collegiate realm (e.g., including extracurricular activities), as opposed to the focus of the current study, which is concerned with engagement in one's professional training undertakings (e.g., architecture's hands-on studio courses). Further, since Astin's initial work there has been considerable evidence suggesting that engagement and involvement are distinct – albeit related – constructs, and that this is the case in

both the educational realm (Goodall & Montgomery, 2014) as well as the employment realm (Scrima, Lorito, Parry, & Falgares, 2014; Steele, Rupayana, Mills, Smith, Wefald, & Downey, 2012).

The present study contributes toward closing the aforementioned gaps in the extant research literature by a) proposing and empirically examining a model of engagement's relations with important employee- and occupationally-relevant constructs, and b) doing so within a sample of recent entrants into professional degree programs, thereby targeting occupational entrants at their earliest point of entry into, and training for, their respective professional fields. This has recently been suggested (Volodina, Nagy, & Koller, 2015) as a crucial time period during which to evaluate occupational interests and commitment and their individual difference predictors, and this holds especially true for job types with a strong professional identity such those studied herein. The aim of the present research is to contribute to the literature by examining an engagement model (Figure 1) that may yield important insights into how early occupational entrants experience their vocational training, thereby delineating ways that vocational training programs can enhance engagement (e.g., by enhancing motivation and/or self-efficacy) and, in turn, also enhance other positive outcomes that are of relevance to their respective professional field (e.g., commitment to the occupation).

Defined as a “persistent, positive affective-motivational state of fulfillment” (Maslach, Schaufeli, & Leiter, 2001, p. 417), engagement comprises *vigor* (energy, effort, resilience, persistence), *dedication* (involvement, enthusiasm, a sense of pride and inspiration), and *absorption* (immersion in one's work, the sense of time passing quickly) (Schaufeli, Martínez, Marques-Pinto, Salanova, & Bakker, 2002a; Schaufeli, Salanova, Gonzalez-Romá, & Bakker, 2002b). Although models of engagement are arguably limited (Rothman, 2003), they include a

model supported by Hakanen, Bakker, and Schaufeli (2006). Grounded in the Job Demands-Resources model, Hakanen et al. identified engagement as a motivational process that mediates the relation between job resources and organizational commitment. Salanova and Schaufeli (2008) likewise confirmed a model of engagement mediating the relation between job resources and proactive behavior, and others (Xanthopoulou, Bakker, Heuven, Demerouti, & Schaufeli, 2008) found that engagement mediated the relation between self-efficacy and job performance. Beyond this, Fredrickson's (2001) broaden and build theory suggests that engagement may be predicted by other positive constructs, and may in turn be predictive of subsequent positive outcomes. This is in line with the 'upward spirals' facet of the theory, such that positive affective states and behaviors beget subsequent positive affective states and behaviors, which in turn beget others, reinforcing a cyclical pattern.

Motivation as Predictive of Engagement

Motivation is herein considered within the context of Deci and Ryan's (1985) self-determination theory (SDT), a particularly comprehensive and empirically-supported theory of motivation (Schunk, Pintrich, & Meece, 2002). SDT distinguishes between two broad types of motivation that exist along a continuum of self-determination, postulating that there are diverse positive consequences associated with acting in a self-determined manner. The more self-determined forms of motivation represent intrinsic motivation, characterized by a person performing a task not as a means to an end, but rather as an end in itself (Deci & Ryan, 2000). Conversely, in extrinsic motivation, the task is instrumental in that the individual views it as a means to an end. A more extensive underlying continuum includes six more specific types of motivation: *intrinsic motivation to know* (engaging in an activity because one enjoys the process of learning and exploring new ideas), *intrinsic motivation to accomplish* (feeling enjoyment in

the process of achieving), *intrinsic motivation to experience sensory stimulation* (whereby engaging in an activity is physiologically rewarding) (Vallerand, Pelletier, Blais, Brière, Senecal, & Vallieres, 1992), *extrinsic identified regulation* (an individual comes to value certain behaviors and understand their importance, engaging in them because they are likely to lead to outcomes that the individual values), *extrinsic introjected regulation* (internalization of external contingencies), and *external motivation* (reacting solely to rewards and punishments) (Deci & Ryan, 1985, 2000).

Although early thought on extrinsic motivation suggested that it reflected only non-self-determined behavior, research has since consistently supported the different types of both extrinsic (Deci & Ryan, 1985, 2000) and intrinsic (Vallerand et al., 1992) motivations. Such research (e.g., Koestner & Loier, 2002) has likewise argued that the motivational facets within each of these two broad categories exist along a continuum of self-determination, as opposed to the raw dichotomy that had been previously suggested. As such, modeling them as a composite construct with multiple measured indicators is optimal, as it does not falsely dichotomize them preemptively (as would modeling them as two separate constructs). Indeed, the nature of the continuum suggests that such a duality is nonoptimal for this reason, as has past research (Bénabou & Tirole, 2003; Reiss, 2012). Ryan and Deci (2000) clarify this in regard to the extrinsic motivation facets in particular, noting that “there are varied types of extrinsic motivation, some of which do, indeed, represent impoverished forms of motivation and some of which represent active, agentic states” (p. 55) – a contention supported by Koestner and Losier (2002). As such, dichotomizing them preemptively as an entirely separate construct from the facets of intrinsic motivation – which fall along the same self-determination continuum – is misrepresentative of the true nature of the motivation composite. In recognizing this, Moran et

al. (Moran, Diefendorff, Kim, & Liu, 2012) utilized motivational ‘clusters’ that looked beyond a dichotomy and considered the more dynamic nature of a composite motivational construct, much like the greater dynamism allowed for by the composite measurement herein.

Consistent with the self-determination continuum and the variable internalization of motivational facets, it is expected that all such facets will contribute to positively predicting engagement due to their inherent motivational capacity. Reeve (2002) indicated that engagement is comprised of both constructive behaviors (e.g., attention, effort, persistence) and positive affect (e.g., interest, enjoyment, enthusiasm), consistent with conceptualizations of engagement as encompassing both behavioral and emotional components. More specifically, Reeve argued that engagement is a manifested motivational state, evidenced by the constructive behaviors of attention, effort, and persistence as they are widely understood to comprise motivation. Nevertheless, the more internal nature of engagement suggests that motivational facets indicating a higher degree of self-determination (e.g., generally intrinsic motivation facets) may be more likely to be stronger predictors than extrinsic motivation facets (Koestner & Losier, 2002; Thomas, 2009). This is in line with Fredricks et al.’s (2004) contention that increased self-determination can lead to increased engagement. As such, engagement can serve to provide instructors with an observable indication of students’ motivation – important because, as the present model proposes, such motivation and engagement may ultimately impact professional commitment. This is suggested by Fredricks et al.’s (2004) findings that low academic engagement can lead to a variety of negative consequences including compromised achievement, absenteeism, truancy, and drop-out behaviors – all short-term indicators of the more long-term occupational commitment outcome. As such, altogether the evidence suggests the likelihood of a direct relation between motivation and engagement.

Hypothesis 1: Composite motivation will predict engagement among occupational trainees.

Self-Efficacy as Predictive of Engagement

The influence of self-efficacy – one’s belief regarding his or her capabilities – on behavior works in three ways: by affecting behavior choice, effort/persistence on a task, and physiological arousal (Bandura, 1986). As such, an individual’s confidence in his or her abilities to successfully complete certain activities is related to how motivated that individual is to attempt those tasks (thus, motivation and self-efficacy covary in the hypothesized model). Competence self-perceptions are an important element of positive organizational behavior, such that self-efficacious individuals may be more likely to involve themselves in a task as well as willingly expend more effort and persistence on the task (Boggiano, Flink, Shields, Seelbach, & Barrett, 1993), all of which are key elements of engagement. Although he did not empirically test the relation, Shirom (2003) suggested that vigor – a construct closely related to engagement – was conceptually related to self-efficacy based on the supposition that vigor relates to the desire to master one’s environment. Likewise, Stajkovic and Luthans (1998) included in their explication of self-efficacy the supposition that a self-efficacious individual utilizes energetic resources, which Shirom argued represent the essence of vigor.

Research (e.g., Salanova, Bresó, & Schaufeli, 2005; Schaufeli & Salanova, 2007; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007) has empirically supported that individuals’ feelings of competence are likely to lead to their experiences of engagement. Likewise, others (Demerouti, Bakker, de Jonge, Janssen, & Schaufeli, 2001) have suggested that engaged individuals are confident in their knowledge, skills, and abilities to successfully perform

relevant task demands. These contentions were further empirically supported by Halbesleben's (2010) meta-analytic findings that the personal resource of self-efficacy is significantly positively associated with engagement. As Schaufeli et al. (2002a) noted, this also appears to be true in the academic realm in that engaged students are more likely to be self-efficacious than are students who are not engaged in their work. Altogether, the evidence suggests the likelihood of a direct relation between self-efficacy and engagement.

Hypothesis 2: Self-efficacy will be predictive of engagement among occupational trainees.

Why Should We Care? Occupational Commitment as an Outcome of Engagement

Occupational commitment has become increasingly pertinent in recent decades, given workplace changes such as decreasing job security and a lessened sense of obligation to a specific organization. Meyer, Allen, and Smith's (1993) three facets of commitment – *Affective* (the emotional attachment that an individual has to his or her occupation), *continuance* (an individual's desire to remain in the occupation as a result of high perceived costs of leaving), and *normative* (the obligation one feels to remain in the occupation) are often aggregated to assess overall commitment (Meyer & Herscovitch, 2001), as is the case herein. Several studies have identified various correlates of occupational commitment, including Meyer, Becker, and Vandenberghe's (2004) suggestion that self-efficacy is related to motivation and, therefore, also to commitment. Likewise, Sinha, Talwar, and Rajpal (2002) found self-efficacy to be positively correlated with *organizational* commitment, and others (Tannenbaum, Mathieu, Salas, & Cannon-Bowers, 1991) found the same relation in a training context relevant to the one herein, though again for *organizational* commitment. Nevertheless, the research on the relations between these variables remains limited, and is particularly lacking in regard to *occupational*

commitment, with the exception of Klassen and Chiu (2011) who found that self-efficacy impacted both organizational and occupational commitment.

The present research serves to contribute toward filling this gap in exploring occupational commitment's predictive relations with these constructs, including proposing engagement as a possible mediating mechanism. Although empirical research targeting such a relation is limited, Vance (2006) theoretically supported the link between engagement and commitment, arguing that the manner in which one would go about increasing each of them is similar. For instance, engagement can be heightened by making tasks meaningful and allowing individuals increased variety and autonomy (Vance, 2006). Likewise, commitment can be increased by facilitating the acquisition of knowledge and skills, which also increases self-efficacy. Halbesleben (2010) furthered this theoretical support by emphasizing that "the high-identification nature of engagement should result in high levels of association with outcomes such as organizational commitment" (p. 104). Empirically, Shernoff and Hoogstra (2001) found that engagement predicted career commitment, and Halbesleben (2010) provided meta-analytic evidence supporting the positive relation between engagement and organizational commitment. In fact, engagement and commitment have been found to have such a strong positive correlation that Saks (2006) attempted to clarify a definitional issue in finding that organizational commitment and engagement are not one in the same, as the former is attitudinal while the latter is behavioral. Hallberg and Schaufeli (2006) reached a similar conclusion, finding that the two constructs are distinct and thus reflect different aspects of positive attachment to one's work. Altogether, the evidence suggests the likelihood of a direct relation between engagement and commitment and, compounded with the prior evidence justifying the proposed antecedents of engagement, the latter's role as a mediating mechanism in these relations.

Hypothesis 3: Engagement will predict occupational commitment among occupational trainees.

Hypothesis 4: Engagement will mediate the relations between a) motivation and occupational commitment, and b) self-efficacy and occupational commitment.

Given the aforementioned justification for the hypothesized relations, we further propose that the constructs function together within a holistic model (see Figure 1) representing and extending the above relations, and in line with researchers' (Rothman, 2003; Saks, 2006) calls for further exploration into engagement's nomological network within broader models, particularly within samples of individuals training for their future professions. Specifically, we examine how well these proposed antecedents and outcome of engagement function together to create a more meaningful, comprehensive picture of what it means to be engaged and how such engagement can be fostered among occupational trainees.

Research Question: Will a composite mediation model fit the data and evidence significantly predictive path coefficients for each model facet?

Insert Figure 1 about Here

Needs Matter: Need for Achievement as a Moderator

The impact of need for achievement (NAch) on the relation between motivation and engagement is explored as consistent with Elliot, McGregor, and Thrash's (2002) contention that NAch is relevant to a compilation of motivational issues. Deci and Vansteenkiste (2004) likewise suggested that growth orientation is an important intrinsic need relating to Deci and Ryan's (1985) Self-Determination Theory of motivation. In fact, Ryan, Connell, and Grolnick (1992) noted that early studies of motivation in academia were conducted in regard to achievement motives. More specifically, Eisenberger, Jones, Stinglhamber, Shanock, and Randall (2005)

found that NACH evidences positive associations with high skill and challenge, task performance, and, most importantly in regard to the present study, task interest – a fundamental aspect of motivation. This linkage is extended in noting that McClelland's (1961) NACH and Vallerand et al.'s (1992) *intrinsic motivation to accomplish* both stress an individual's desire to grow and successfully meet goals, although despite their conceptual similarities, initial research has found them to be positively related although empirically distinct (Mills, 2011).

Research has also identified a linkage between achievement needs and engagement, and Hallberg, Johansson, and Schaufeli (2007) found that the achievement striving aspect of Type A behavior is related to work engagement. Pulling together both of these lines of evidence, research (e.g., Maslach et al., 2001) has linked engagement with Hackman and Oldham's (1976) motivational Job Characteristics Model (JCM). This motivational model proposes, in part, that individuals' internal psychological states impact personal and work outcomes, including heightened performance and decreased withdrawal behaviors. Such outcomes are indicative of task engagement, which is associated with increases in performance and decreases in withdrawal behaviors (absenteeism, turnover) (see Halbesleben, 2010). The job characteristics model further represents the construct of *growth need strength* – a conceptually similar construct to NACH – as moderating these relations between psychological states and one's experiences of the work. We suggest that the internal psychological states within the job characteristics model are themselves representative of motivational characteristics, and that engagement is representative of one's experience of the work (e.g., Halbesleben, 2010). It is in this vein, then, that we suggest that NACH will moderate the relation between motivation and engagement in much the same way that growth need strength serves as a moderator within the JCM, informed by the understanding that “differences among people moderate how they react to their work, and individual need strength

appears to be a useful way to conceptualize and measure such differences” (Hackman & Oldham, 1976, p. 258). Altogether, the evidence suggests that need for achievement should serve a moderating function between motivation and engagement. As Hackman and Oldham (1976) suggested, individuals with a stronger need for achievement should be expected to have more positive experiences (e.g., engagement) in a role that is high in motivating potential than will individuals with less desire for growth and development.

Hypothesis 5: Need for achievement will moderate the relation between composite motivation and engagement, such that the relationship will be stronger for individuals with a higher need for achievement than for those with low need for achievement.

Overall, the present study attempts to extend the empirical literature by furthering understanding at the nexus of engagement, commitment, and relevant individual differences within early occupational entrants and trainees. Trainees’ need for achievement is also examined as a possible factor impacting the proposed relation between motivation and engagement, therefore further enhancing understanding of these important individual-level constructs as they relate to individual differences and outcomes. It is our hope that examining these proposed relations will yield greater insights into this important sample to consider when understanding individuals’ experiences of their occupation and how to optimize such experiences for enhanced involvement and commitment. More specifically, this research aims to yield crucial insights into how early occupational entrants experience their vocational training, and how such experiences and internal characteristics may impact their intended commitment to the profession overall.

Method

Participants and Procedure

Participants were 311 first-year undergraduates in the professional degree programs of Architecture and Engineering at a large university in the Midwestern United States. Participants who had not completed a majority of each measure were discounted, yielding a final sample of 247, comprised of 35% ($n = 87$) Architecture and 65% ($n = 160$) Engineering majors. Mean age was 19.10 ($SD = 1.72$), while 68% were male and 32% were female. The sample was limited to first-years in order to quell confounding factors that might arise if the sample was broadened to include all years, as these majors have a reasonably high turnover after the first year. Therefore, including trainees beyond the first year would have likely resulted in range restriction reflecting unrepresentatively high occupational commitment in particular and compromising variance.

Two e-mails including survey links were sent to all engineering and architecture first-years ($N = 631$, 49% response rate). Additionally, the administration of each of these programs sent a mass e-mail encouraging participation. All eligible engineering and architecture students received weekly e-mail reminders about the survey. After four weeks, these reminders ceased regardless of whether or not the individual had completed the survey. No inducements were offered for participating.

Measures

In addition to demographics, the following measures were administered. See Table 1 for intercorrelations and Cronbach's coefficient alpha reliabilities.

Self-Efficacy was measured using the College Academic Self-Efficacy Scale (Owen & Fromen, 1988), assessing the degree of confidence individuals have in their ability to successfully complete the behaviors listed. The scale is comprised of 32 items measured on a five-point Likert scale ranging from 1 (*very little confidence*) to 5 (*a lot of confidence*). The list of behaviors includes items such as "participating in class discussion," and "taking well-

organized notes during lecture.” Prior studies have provided substantial support for the psychometric properties of this measure (e.g., Choi, 2005).

Motivation was assessed via the Academic Motivation Scale (Vallerand, et al., 1992), consisting of seven factors measured by 28 items. Responses were on a seven-point Likert scale ranging from 1 (*very strongly disagree*) to 7 (*very strongly agree*). Sample items include [I am training for this occupation...] “Because I experience pleasure and satisfaction while learning new things” (IM to know), “For the pleasure I experience while surpassing myself in my studies” (IM to accomplish), “For the ‘high’ feeling that I experience while reading about various interesting subjects” (IM to experience stimulation), “Because eventually it will enable me to enter the job market in a field that I like” (extrinsic; identified), “To prove to myself that I am capable of completing my college degree” (extrinsic; introjected), and “In order to obtain a more prestigious job later on” (extrinsic; external). Prior studies have provided support for the psychometric properties of this measure (e.g., Fairchild, Horst, Finney, & Barron, 2005).

Need for Achievement was assessed via its respective subscale of the Manifest Needs Questionnaire (Steers & Braunstein, 1976). The subscale includes five items measured on a seven-point Likert scale ranging from 1 (*never*) to 7 (*always*). A sample item is, “I do my best work when my assignments are fairly difficult.” Prior studies have provided support for the psychometric properties of this subscale (e.g., Chusmir, 1988), although in the present study an item analysis called for the removal of one item (“I try to avoid any added responsibilities...”) to improve scale reliability, as is not uncommon with such reverse-coded items. This item was removed prior to analyses.

Engagement was measured via the Utrecht Work Engagement Scale (Schaufeli et al., 2002b), a 17-item measure using a seven-point Likert scale ranging from 1 (*never*) to 7 (*always*).

It is comprised of three subscales; vigor (six items), dedication (five items), and absorption (six items). Sample items include “When studying I feel strong and vigorous” (vigor), “I find my studies to be full of meaning and purpose” (dedication), and “I get carried away when I am studying” (absorption). Prior studies have provided support for the psychometric properties of this measure (e.g., Mills, Culbertson, & Fullagar, 2012).

Occupational Commitment was assessed with the Occupational Commitment Scale (Meyer, et al., 1993). It includes 18 items and responses are given using a seven-point Likert scale ranging from 1 (*very strongly disagree*) to 7 (*very strongly agree*). Sample items include, “Architecture is important to my self-image” (affective), “I have put too much into the architecture profession to consider changing now” (continuance), and “I do not feel any obligation to remain in the architecture profession” (normative; reverse-coded). For the purposes of the current study, the items in this scale were modified slightly to reflect the professions of interest, as is common practice with this scale (Snape & Redman, 2003). Prior studies have provided support for the psychometric properties of this measure (e.g., Sinha et al., 2002).

Insert Table 1 about Here

Results

Data were analyzed via structural equation modeling using AMOS 21. This technique allows for analysis of full models in addition to piecemeal parameter estimates. It also provides additional quantitative information that assists in modifying a model to yield a better fit if necessary, providing such a modification is theoretically supported. This is in line with one of the aims of optimal usage of this technique, which avoids the confirmation bias produced by testing only one model without exploring alternatives or adjustments that could improve fit

(Shah & Goldstein, 2006). As such, the Model 1 as proposed in the Research Question (see Figure 1) was first examined. It yielded a non-optimal fit, $\chi^2 (73) = 463.65$, CFI = .82, NFI = .79, GFI = .76, RMSEA = .15, RMR = .16, thus indicating the need for respecification. Such respecification was conducted at the recommendation of researchers who have noted that structural equation modeling should be used to facilitate respecification of a model that lacks an ideal fit (Anderson & Gerbing, 1988; Bentler & Bonnet, 1980). Therefore, the model was respecified, keeping in mind theoretical as well as statistical considerations such as modification indices. Specifically, an analysis of effects from Model 1 indicated that an additional direct path from motivation to commitment should be included, a modification supported by calls for more research linking these two conceptually-related constructs (e.g., Canrinusa, Helmps-Lorenza, Beijaardb, Buitinka, & Hofman, 2012; Yousaf, Yang, & Sanders, 2015). Further, extrinsic motivation indicators were omitted from Model 2, allowing for intrinsic motivation to be distinctly captured. Again this resulted from both theoretical and statistical considerations. Specifically, intrinsic motivation better aligns with the internal nature of the other constructs represented in the model, particularly engagement, which is largely autotelic in nature. Moreover, extrinsic motivation evidenced lower measurement weights (.31, .34, .12) as compared to intrinsic motivation (.48, .55, .41), and there was a negligible decrease in motivation's direct relation to engagement once extrinsic factors were omitted (.03; see Table 2), thus indicating that the inclusion of extrinsic factors was superfluous in addition to compromising parsimony. After these respecifications to Model 1, Model 2 provided an excellent fit, $\chi^2 (37) = 110.88$, CFI = .96, NFI = .93, GFI = .92, RMSEA = .09, RMR = .08, and was superior to Model 1, $\Delta\chi^2 (36) = 352.77$, $p < .001$.

Insert Table 2 about Here

As is evident in Table 2, all hypothesized direct relations were supported. Composite motivation was significantly predictive of engagement, with a direct effect of .46, $p < .01$ (Model 1), as was intrinsic motivation alone, with a direct effect of .54, $p < .01$ (Model 2), thereby both supporting and extending Hypothesis 1. Self-efficacy was likewise significantly predictive of engagement with direct effects of .25, $p < .01$ (Model 1), and .29, $p < .01$ (Model 2), thereby supporting Hypothesis 2. Finally, engagement was significantly predictive of occupational commitment with direct effects of .37, $p < .01$ (Model 1), and .25, $p < .01$ (Model 2), thereby supporting Hypothesis 3. Moreover, squared multiple correlations for the endogenous variables indicated the extent of variance in engagement and occupational commitment, respectively, that could be accounted for by their respective predictors: For Model 1, Engagement $R^2 = .36$, $p = .01$, Occupational Commitment $R^2 = .14$, $p < .01$; for Model 2, Engagement $R^2 = .51$, $p < .01$, Occupational Commitment $R^2 = .48$, $p < .01$.

Engagement's role as a mediator was examined via Baron and Kenny's (1986) method. Significance of the direct effect between intrinsic motivation and occupational commitment both with (.64, $p < .001$) and without (.69, $p < .001$) engagement as an intermediary indicated that engagement serves a partial mediation function, again supporting the efficacy of the direct relation between intrinsic motivation to commitment. The self-efficacy predictor, on the other hand, significantly predicted occupational commitment without engagement as an intermediary (.14, $p = .03$), but lost significance once engagement was introduced (.07, $p = .61$), thereby indicating full mediation of engagement in this relation. At the recommendation of Tofighi and MacKinnon (2016), such mediated relations were further confirmed by tests of indirect effects via Monte Carlo bootstrapping, which yielded significance in the case of both the intrinsic

motivation predictor ($p = .002$) and the self-efficacy predictor ($p = .003$) impacting occupational commitment through engagement. As such, Hypothesis 4 was supported.

Finally, Hypothesis 5 explored the possibility that NACH moderated the relation between motivation and engagement. NACH was dichotomized into high and low need via a tertile split (Preacher, Rucker, MacCullum, & Nicewander, 2005), and moderation was assessed using widely-accepted model comparison options in AMOS. Two datasets were constructed, using data from the upper and lower tertiles, respectively. The two models were run concurrently, with results indicating that the two groups were significantly different, $\chi^2(52) = 158.82, p < .001$, thereby supporting Hypothesis 5 such that the relation between motivation and engagement was substantially stronger for trainees high in NACH than for low-NACH trainees.

Discussion

Together, these results provide important insights into how early occupational entrants experience their vocational training, and how such experiences and internal characteristics impact their commitment to the profession as a whole. Engagement's nomological net was evaluated with a particular focus on its relations with the predictors of self-efficacy and motivation (intrinsic, extrinsic), and its role as a proposed mediator in a structural equation framework that set occupational commitment as a distal outcome.

All individual relations within the model were supported as hypothesized, such that both self-efficacy and motivation (composite and intrinsic) significantly predicted engagement, indicating that these individual differences have important effects on individuals' experiences of their work and training programs. It is worth noting that the two most self-determined facets of extrinsic motivation (identification, introjection) were significantly related to engagement, but were omitted in Model 2 for parsimony's sake because of their lack of unique contribution

beyond that of intrinsic motivation, and because theoretically extrinsic motivations are less intricately tied to the autotelic concept of engagement as compared to intrinsic motivations. Nevertheless, it should not be discounted that, in the absence of intrinsic motivation, self-determined extrinsic motivations could still prove useful in predicting outcomes such as engagement, as indicated by their significant individual coefficients herein.

Engagement, in turn, significantly predicted occupational commitment, evidencing the importance of these relations on a practical level for professional involvement and retention. Engagement was likewise found to partially mediate the motivation–commitment relation, and to fully mediate the self-efficacy–commitment relation, thereby lending further credence to engagement’s intermediary status in the models, and going toward justifying the construct’s recent popularity in the literature as well as practice. This is further supported by the finding that substantial variance in both engagement and commitment was accounted for by their respective predictors, suggesting the efficacy of the proposed nomological net and the importance of this combination of predictors in determining occupational entrants’ experience in their chosen vocation as well as their intention to remain in that profession.

The proposition of these holistic models examined the relations between these constructs from a more macro perspective. While the initially-proposed structure of this model (Model 1) provided a non-optimal fit, respecification adding a direct path from (intrinsic) motivation to commitment (Model 2) yielded an excellent fit, thereby further clarifying engagement’s nomological net as well as extending the limited literature on the motivation–commitment relation. In regard to the latter, the present research answered Snape and Redman’s (2003) call for future research investigating the Occupational Commitment Scale – originally administered to nursing students – on different occupations and samples. More importantly, however, this

research answers recent calls for investigations into the under-studied relation between motivation and commitment (Carrinusa et al., 2012; Yousaf, Yang, & Sanders, 2015). While not one of the initial direct relations hypothesized herein, respecifications and analyses of additional direct effects indicated that the two have a significant and strongly positive direct relation. This is an important finding contributing to this literature gap, providing vital preliminary empirical evidence to inform future research and practice. On an individual level, this finding emphasizes the importance of carefully choosing the occupation that one plans to enter, knowing that doing so is ultimately likely to beneficially impact one's experience of the work and desire to continue in the field. This could have implications for career counseling such that understanding characteristic differences between those who do and do not persist in an occupation may, over time, better inform the predictive ability of career counseling, giving counselors more information upon which to draw that can impact an entrant's likelihood of enduring in their intended profession. This is particularly relevant in today's workforce, considering the rising number of individuals changing careers at least once during their work-life (Sullivan & Arthur, 2006; Wise & Millward, 2005). On an occupational level, this finding has implications for occupational societies, such that identifying and supporting their members who are most intrinsically motivated toward the profession is likely to be associated with an increase in those key individuals' intended occupational commitment. Over time, understanding such motivation and commitment in members of a profession could – particularly for occupations suffering from low frequency of entry and/or high attrition – contribute to a more dedicated workforce. Fortunately for the future of professional occupations, as well as for the more micro individual employee experience, occupational training institutions can foster intrinsic motivation in their trainees through the principles of job design. As the present research has shown, taking steps to

maximize the intrinsically motivating potential of training and work activities (e.g., emphasizing task meaningfulness, offering task variety) as well as facilitating self-efficacy in trainees (e.g., via recounting and attribution of prior successes, comparisons to successful referent others) has the potential to improve trainees' experience of the work, thereby increasing the likelihood that they will remain committed to their chosen occupation.

Finally, support was also found for the hypothesis that need for achievement moderates the predictive relation between motivation and engagement, such that the relation is stronger for individuals with higher need for achievement than for those with low NACH. Although this finding is rooted within an individual difference construct, it has implications both at the selection (occupational or organizational entrance) level, as well as for determining the nature of support and motivating environment that may optimally benefit an occupational entrant thereafter. This is particularly the case in light of McClelland's (1961) contention that need for achievement is a learned, versus an innate, need – thus this is something that, while it varies across individuals, holds the promise of malleability appropriate for training interventions targeting NACH which, in light of the present results, could go toward strengthening individuals' engagement in their work, and, ultimately, their commitment to their chosen profession.

Limitations

The fact that this study was conducted with trainees in architecture and engineering yields both an intended benefit (application within this important sample) and a limitation. Specifically, these professional degree programs were chosen because of their practical nature and their integration of knowledge and application – characteristics not common amongst trainees in less applied fields. That said, while attempts were made to quell these differences by sampling first-year students who do not yet have as much hands-on experience in their respective

industries, these industries are arguably quite different from many others in that they are more applicative and action-oriented. As such, individuals in such occupations may have more of a commitment to their profession. In particular, continuance commitment may be heightened in professional occupations as compared with other career fields, considering the additional investments in the occupation that are frequently made by such professionals (e.g., education/training level, memberships in occupational organizations).

Another limitation is that data were collected cross-sectionally, thereby precluding causal inferences. Data were also self-reported, thereby raising the issue of potential common method variance (CMV). However, given the inherently intrinsic nature of the variables examined herein, self-report measures are an appropriate measurement approach. Further, Spector (2006) attested to the appropriateness of self-report measures, arguing that they may not produce the biases that have been attributed to them, and Goffin and Gellatly (2001) found that self- and peer-report measures are largely redundant, and that responses on self-report measures are primarily driven by experiences as opposed to systematic bias due to defensive responding. Nevertheless, we examined our data for evidence of CMV, indicating that such bias was unlikely to be driving results. Specifically, a) multiple strong factors were identified in a Harman's Single-Factor Test for CMV, and b) not all study variables were significantly correlated, indicating that results were unlikely to be due to false internal consistency (Brannick, Chan, Conway, Lance, & Spector, 2010).

Future Research

Future research would do well to consider a longitudinal design that could expand upon the inferences drawn herein from the perspective of those who have persisted in their career over time. Specifically, there may be characteristic differences between what drives commitment for

occupational entrants (e.g., may be more likely to be affective) as opposed to ‘vocational veterans’ (e.g., normative and/or continuance commitment). Explicit empirical attention to this employee lifecycle consideration via longitudinal design could yield important implications for understanding how professionals’ cognitions regarding (and subsequent decisions about) their chosen profession may differ over time and with regard to professional tenure. Likewise, research should be expanded in order to include a representative sampling of various professional domains, as well as with consideration for the often gendered nature of many professional occupations (e.g., male-dominated architecture and engineering, female-dominated nursing and teaching) and how that may impact intended professional commitment. A more heterogeneous sample would also allow for further exploration of the relation between motivation and occupational commitment, which remains an important gap in the research literature. While the present research provided an initial assessment of this relation, further investigation is warranted, particularly with an eye toward the intrinsic conceptualization of motivation. At a more micro level, the authors suspect that the types of intrinsic and extrinsic motivation may relate differently to the various indicators of occupational commitment. For example, extrinsic motivation may be more likely to predict continuance commitment, whereas intrinsic motivation may have a stronger relation with affective commitment.

Furthermore, researchers should also be cautious in attempting to apply this or similar research cross-culturally. That is, some of the variables examined in the present study – in particular self-efficacy and need for achievement – may differ in collectivistic cultures where the self is not seen as having the importance that it is believed to have in individualistic cultures such as the United States. Zhao, Kuh, and Carini (2005) have likewise suggested that international students studying in the United States are differently engaged in their schoolwork than are their

American counterparts. As such, future research would do well to replicate and extend this research both cross-nationally and cross-culturally in order to more comprehensively investigate how concepts such as these may differ when the culture is collectivistic as opposed to individualistic. This is particularly important given the global nature of today's occupations and workforce.

Conclusion

In sum, the present study extended the understanding of engagement and its proposed antecedents (motivation, self-efficacy) within early entrants into (trainees for) the professional occupations of engineering and architecture. The study contributes to expanding our understanding of occupational entrants' experiences in training for their profession, and how those experiences and their individual characteristics ultimately impact their commitment to their vocation. This is a crucial sample to consider, given that occupational entrants – and the extent of their commitment to their respective fields – form the basis of a profession's trajectory and success moving forward.

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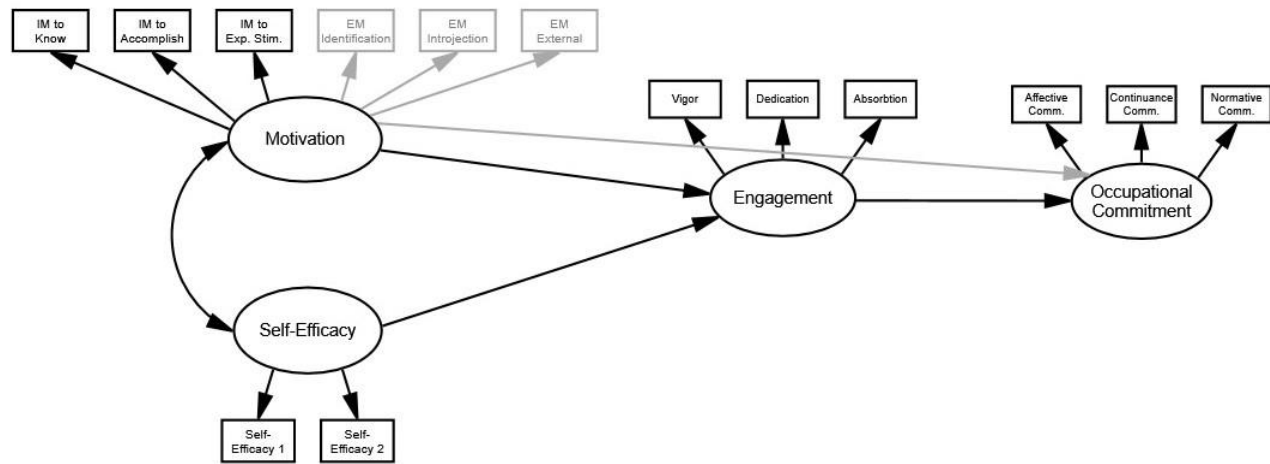
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Figure 1*Model 1 and Model 2 † ‡*

† Grey paths/variables represent changes from Model 1 to Model 2, as follows:
 Model 1 is represented by diagram excepting motivation→commitment direct path.
 Model 2 is represented by diagram excepting extrinsic motivational factors.

‡ Structural equation modeling precludes analysis of unidimensional latent variables, therefore self-efficacy was evenly divided into two subscales (odd-numbered items, even-numbered items) prior to aggregation.

Table 1*Means (M), standard deviations (SD), reliability coefficients^a and correlations*

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15							
1.	3.58	.56	(.86)									
2.	3.64	.59	.91**	(.90)								
3.	5.68	.99	.41**	.44**	(.85)							
4.	4.98	1.06	.32**	.33**	.72**	(.82)						
5.	4.12	1.26	.16*	.12	.49**	.60**	(.84)					
6.	6.02	.84	.36**	.37**	.69**	.53**	.33**	(.78)				
7.	5.21	1.20	.09	.05	.49**	.66**	.48**	.48**	(.84)			
8.	5.91	.96	.15*	.15*	.43**	.41**	.19**	.62**	.56**	(.78)		
9.	3.78	1.27	.35**	.34**	.38**	.48**	.41**	.23**	.33**	.09	(.90)	
10.	4.77	1.11	.48**	.49**	.57**	.57**	.35**	.42**	.32**	.19**	.69**	(.86)
11.	3.88	1.20	.34**	.34**	.38**	.45**	.36**	.23**	.28**	.06	.83**	.71**
	(.86)											
12.	5.50	1.26	.31**	.31**	.53**	.47**	.22**	.50**	.32**	.41**	.28**	.48**
	.28**	(.90)										
13.	3.89	1.33	-.04	-.06	.04	.12	.08	.01	.18**	.18**	.10	.07
	.15*	.18**	(.83)									
14.	3.69	1.30	-.04	-.04	.14*	.24**	.20**	.11	.33**	.26**	.31**	.17**
	.31**	.28**	.52**	(.82)								
15.	5.03	0.73	.47**	.47**	.50**	.43**	.18**	.49**	.28**	.31**	.33**	.50**
	.34**	.49**	.13*	.12	(.65)							

^a Cronbach's α reliability coefficients are presented in the main diagonal in parentheses* $p < .05$, ** $p < .01$

1. Self-Efficacy Odd, 2. Self-Efficacy Even, 3. IM to Know, 4. IM to Accomplish, 5. IM to Experience Stimulation, 6. EM Identified, 7. EM Introjected, 8. EM External, 9. Engagement Vigor, 10. Engagement Dedication, 11. Engagement Absorption, 12. Affective Commitment, 13. Continuance Commitment, 14. Normative Commitment, 15. Need for Achievement

Table 2*Standardized Direct, Indirect, and Total Effects for Model 1 and Model 2*

<i>Outcome</i>	<i>Model 2</i>		<i>Determinant</i>	<i>Model 1</i>		<i>Total</i>
	<i>Direct</i>	<i>Indirect</i>		<i>Direct</i>	<i>Indirect</i>	
Engagement			Motivation †	.46	----	.46
.54	----		.54			
Engagement			Self-Efficacy	.25	----	.25
.29	----		.29			
Occupational Commitment			Engagement	.37	----	.37
.25	----		.25			
Occupational Commitment			Motivation †	----	.17	.17
.51	.14		.64			
Occupational Commitment			Self-Efficacy	----	.09	.09
----	.07		.07			

† In Model 1 motivation was comprised of both intrinsic and extrinsic motivations; in Model 2 it was comprised of solely intrinsic.

Highlights

- Motivation and self-efficacy both individually and collectively predict engagement among occupational trainees
- Motivation evidences a direct effect on occupational commitment among occupational trainees
- Engagement in one's occupational training predicts occupational commitment
- Engagement mediates the self-efficacy–commitment relation, and partially mediates the motivation–commitment relation
- Need for achievement moderates the relation between motivation and engagement among occupational trainees