"Stop trying to find meaningful work,

create it instead"

"A study examining the relationship between job crafting and work engagement and the

mediated and moderated role of meaningful work and age among white-collar employees"

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Abstract

Job crafting has been shown as an important mechanism to increase work engagement, but the underlying processes have received little attention. The current study is among the first to examine whether meaningful work functions as a mediator in the relationship between job crafting and work engagement. Also the moderating role of age on the relationship between job crafting, meaningful work and work engagement is examined. A total of 378 white-collar employees working in the Netherlands, Germany and Sweden completed an online survey to assess their work experiences. Results showed that meaningful work partially mediated the relationship between three different subscales of job crafting and work engagement. For age, non-significant results were found which might be due to the fact that because of anonymity requirements, age was measured as a categorical variable. It is concluded that crafting social job resources, crafting structural job resources, crafting challenging job demands and meaningful work are important mechanisms to increase work engagement and that both organizations and employees can benefit from the insights of this study.

Keywords: job crafting; meaningful work; age; work engagement

Introduction

For years scholars have suggested that having engaged employees is a key driver of organizational success (e.g. Hoole & Bonnema, 2015; Kim, Kolb & Kim, 2013; Lockwood, 2007). Engaged employees, who are characterized by a positive work-related state of mind and high levels of energy, are among other things less absent, better performers and less likely to leave the organization (Bakker, Hakanen, Demerouti & Xanthopoulou, 2007; Schaufeli, 2018). Reason for this is that engaged employees are happier and more satisfied with their jobs and in addition, experience better health (Bakker & Demerouti, 2008). Although it seems that both organizations and employees can benefit from work engagement, the State of the Global Workplace report (Gallup, 2018) states only 16% of all employees worldwide are engaged at work. In order to raise engagement, companies have tried financial rewards and fringe benefits (Kulikowski & Sedlak, 2017; Scott & McMullen, 2010). However, these rewards have been losing their power as central motivator of work engagement (Geldenhuys, Laba & Venter, 2014), as employees seem to want and need more than compensation alone (Steger, Dik & Duffy, 2012). Therefore, examining other ways to increase work engagement became important. Previous research found that job crafting is an important mechanism to increase work engagement (Bakker, Rodríguez-Muñoz & Sanz Vergel, 2016; Tims, Bakker, & Derks, 2013). Based on the JD-R model, job crafting is defined as the self-initiated changes employees make to balance their job demands and job resources with their personal abilities and needs (Tims et al. 2013). Although the positive relationship between job crafting and work engagement is clear, up to date the underlying processes relating job crafting to work engagement are under examined (Demerouti, 2014; Shin, Hur & Kang, 2018).

In this research, we propose that the underlying process relating job crafting to work engagement is the experience of meaningful work. Meaningful work is defined as work that is personally significant, holding positive value and being worthwhile (Lysova, Allan, Dik,

Duffy & Steger, 2018). The Meaning and Purpose at Work report (BetterUp, 2018) among 2,285 American professionals found that nine out of ten employees would trade 23% of their lifetime earnings for more meaningful work. Apparently, instead of monetary rewards, meaningful work might be seen as the new driving force behind engagement (e.g. "meaning is the new money"; Hoole & Bonnema, 2015; Wells-Lepley, 2013). Research found that employees who craft their jobs experience their work as more meaningful and that in turn, the experience of meaningful work is positively related to work engagement (Tims et al., 2013; Wrzesniewski et al., 2013; Van Wingerden, Van der Stoep & Poell, 2018). In addition, it is argued that job crafting and meaningful work might be influenced by age, such as that older employees engage more in job crafting behavior and value meaningful work more than younger employees (Froidevaux & Hirschi, 2015; Van Dam, van Vuuren & Kemps, 2017).

The purpose of this study is twofold. First, we examined whether the relationship between job crafting and work engagement is mediated by meaningful work. By addressing the mediating role of meaningful work, this study is among the first to examine meaningful work as underlying process between job crafting and work engagement. A second aim is to get more insight in generational differences in the workplace by examining whether and how age influences the relationship between job crafting, meaningful work and work engagement. The proposed relationships are examined among white-collar employees in an international company, working in the Netherlands, Germany and Sweden[1]. The insights of this study may benefit organizations since work engagement could be increased without having to spend additional money. By fostering a work environment that supports favorable job crafting

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[1] White-collar work is described as professional, managerial, or administrative work (Lips-Wiersma et al., 2016). Many scholars expect that white-collar employees experience more meaningful work than other collared jobs (Lips-Wiersma et al., 2016). In addition, research suggests that job crafting scale used in this study is more suitable for white-collar workers (Berg, Wrzesniewski & Dutton, 2010; Nielsen & Abildgaard, 2012). As previous research examining the relationship between job crafting and work engagement mainly focused on white-collar workers as well (Tims, Bakker & Derks, 2015), white-collar employees are seen as the most appropriate choice to study the proposed relationships in this study.

behaviors for employees, higher levels of meaningful work and work engagement will redound to the benefit of both organizations and employees (Geldenhuys et al., 2014).

Job crafting and work engagement

An often-used model to explain the concept of work engagement is the Job Demands-Resources Model (JD-R model) (Demerouti, Bakker, Nachreiner & Schaufeli, 2001). The underlying premise of the JD-R model is that the characteristics of every occupation can be classified in either job demands or job resources (Bakker & Demerouti, 2007). In short, job demands evoke an energy depletion process, which can lead to exhaustion, whereas job resources induce a motivational process, which can lead to work engagement (Bakker, Demerouti & Schaufeli, 2003). Work engagement refers to a positive, fulfilling, work-related state of mind that is characterized by vigor (i.e., high levels of energy and mental resilience while working), dedication (i.e., strong identification with work and the experiencing of a sense of significance), and absorption (i.e., being happily engrossed in the work; Schaufeli, Bakker & Salanova, 2006). The JD-R model provides a strong theoretical framework to examine factors that may increase work engagement.

Scholars found that one of the possible factors to increase work engagement is job crafting (Bakker et al., 2016; Tims et al., 2013). Based on the JD-R model, Tims et al. (2013) define job crafting as the self-initiated changes employees make to balance their job demands and job resources with their personal abilities and needs. According to Tims, Bakker and Derks (2012) three conceptually different ways of job crafting are positively related to work engagement; crafting social job resources (e.g. seeking advice and support from colleagues), crafting structural job resources (e.g. increasing autonomy) and crafting challenging job demands (e.g. asking for more responsibilities)[2]. Through these different ways of job crafting,

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[2] As job resources have both an intrinsic and extrinsic motivational role, crafting job resources is positively related to work engagement (Bakker, Hakanen, Demerouti & Xanthopoulou (2007). In addition, although challenging job demands require

employees are able to balance their job resources and job demands in line with their own preferences which has a positive influence on work engagement (Bakker, Demerouti & Sanz-Vergel, 2014). Petrou, Demerouti and Schaufeli (2018) recently found a positive relationship between crafting social and structural job resources and work engagement in two yearly follow-ups among 368 Dutch police officers. This finding is line with the two-wave longitudinal study of Schaufeli, Bakker and Van Rhenen (2008) who found that in a sample of 201 managers and executives of a Dutch telecom company, crafting social job resources resulted in greater work engagement one year later. Lots of research found that also crafting challenging job demands is positively related to work engagement (see meta-analysis of Crawford et al., 2010. Several researchers have found similar positive relationships between crafting challenging job demands and work engagement (Bakker, Rodríguez-Muñoz & Sanz Vergel, 2016; Tims et al., 2012). In conclusion, based on previous research it is clear that there are positive relationships between crafting social job resources, crafting structural job resources, crafting challenging job demands and work engagement. However, we still do not know much about the underlying process relating job crafting to work engagement (Demerouti, 2014), as only few researchers examined this (Chen, Yen &Tsai, 2014; Shin et al., 2018). In this research, we propose that the positive relationship between crafting social job resources, structural job resources, challenging job demands and work engagement can be explained through the experience of meaningful work.

Job crafting, meaningful work and work engagement

Although there is a growing interest among scholars in the concept of meaningful work, the scientific literature is still highly fragmented and the empirical research surprisingly

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effort and energy, they also have the potential to promote mastery, personal growth and future gains. As a result, crafting challenging job demands is positively related to work engagement (Crawford, LePine & Rich, 2010).

sparse (Bailey, Yeoman, Madden,Thompson & Kerridge, 2019; Lysova et al., 2018). Bailey and Madden (2016) describe that meaningful work arises when individuals experience an authentic connection between their work and a broader transcendent life purpose beyond the self. Meaningful work therefore is often related to the motivation to make a positive impact on the greater good or to have a higher purpose (Steger et al., 2012). Based on the definitions of Lysova et al. (2018), Rosso, Dekas and Wrzesniewski (2010) and Steger et al. (2012), meaningful work is generally defined as work that is personally significant, holding positive value and being worthwhile.

Research suggests that job crafting may contribute to the experience of meaningful work (Wrzesniewski, LoBuglio, Dutton & Berg, 2013). For instance, through crafting job resources and challenging job demands, employees may establish more positive relationships with colleagues or change their mindset to identify how their work creates benefit for others. As job crafting enables employees themselves to craft their job resources and challenging job demands in line with their own identity, values and desires (Petrou, Bakker & van den Heuvel, 2017; Tims et al., 2013; Wrzesniewski & Dutton, 2001) it is conceivable that as a consequence, the perceived meaning of their work increases. Petrou et al. (2017) found that in a sample of 105 Dutch employees within different occupational sectors, the job crafting dimension of increasing structural resources related positively to meaning-making in general. Moreover, Tims, Derks and Bakker (2016) found that in a three-wave week study among 114 employees, job crafting was related to more meaningfulness in the final week. Besides the positive relationship between job crafting and meaningful work, several scholars found a positive relationship between meaningful work and work engagement (Geldenhuys et al., 2014; Hoole & Bonnema, 2015). Recent cross-sectional research of van Wingerden and Van der Stoep (2018) and Van Wingerden et al. (2018) confirm this positive relationship in a sample of 459 and 1148 highly educated Dutch employees respectively. Although there is a

clear conceptual link between meaningful work and work engagement, scholars argue they are conceptually different[3] (Albrecht, 2013; Baily & Madden, 2016; Lips-Wiersma,Wright & Dik, 2016). Based on the above described literature it is conceivable that meaningful work is the underlying explanation for the positive relationship between the three components of job crafting and work engagement.

The influencing role of age on job crafting and meaningful work

Besides the possible mediating role of meaningful work on job crafting and work engagement, this study proposes that age positively influences the relationship between crafting social job resources, structural job resources, challenging job demands, meaningful work and work engagement. Based on the human capital theory of Becker (1975) it is argued that older workers are more motivated and capable to engage in job crafting behavior, as they are more likely to be self-confident, responsible and self-controlling and have more work related and general knowledge (Kooij, van Woerkom, Wilkenloh, Dorenbosch & Denissen, 2017; Roberts,Walton & Viechtbauer, 2006). In addition, research suggests that as employees' age, the meaning of their work becomes more important, as older employees develop a stronger and more comprehensive professional identity (Kooij et al. 2017). As a consequence, older employees get more insight in their values, strengths and interests and are therefore more likely to create an environment that fits their identity (Kooij et al., 2017). Moreover, lots of research suggests that older employees will more strongly value intrinsically rewarding work outcomes, such as the experience of meaningful work, whereas younger workers will give more priority to extrinsically rewarding work outcomes such as career advancement, promotions and benefits (Baltes et al., 2012; De Vos & Van der Heijden,

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[3] Whereas work engagement arises purely in response to situations or events within the work environment and is seen as an enduring state of mind (Bailey & Madden, 2016; Schaufeli et al., 2012), meaningful work rather describes existential significance and tends to be understood in a wider context of personal life experiences, which could be experienced through unplanned or unexpected moments (Bailey & Madden, 2016; Lips-Wiersma & Wright, 2012).

2015; Froidevaux & Hirschi, 2015; Sterns & Huyck, 2001). However, it is important to note that research suggests that differences might exist among generational cohorts in terms of the conceptualization of meaningful work during different stages of life (Hoole & Bonnema, 2015; Weeks & Schaffert, 2019).

In conclusion, based on previous research it is plausible that older workers are more motivated and better able to craft their job in line with their values, strengths and interests than younger employees. In addition, as older employees might value meaningful work more, they may be more likely to craft their jobs in order to increase their experience of meaningful work. Therefore, it is expected that age positively influences the relationships between crafting social job resources, structural job resources, challenging job demands and meaningful work and that that age positively influences the indirect effect of job crafting on work engagement through meaningful work.

Current study

The current study goes beyond previous research by examining the underlying mechanism relating job crafting to work engagement and examining the positive influence of age. Based on the literature, it is firstly hypothesized that age positively influences the relationships between crafting social job resources, structural job resources, challenging job demands and meaningful work, such that these are stronger for older employees (i.e. moderation by age, H1a). Secondly, it is hypothesized that meaningful work functions as a mediator regarding the positive relationships between crafting social job resources, structural job resources, challenging job demands and work engagement, (i.e. mediation by meaningful work; H1b), but such that these indirect effects are moderated by age (i.e. moderated mediation effect; H1c). All in all, the following research question will be examined: *Are the positive relationships between crafting social job resources, crafting structural job resources,*

crafting challenging job demands and work engagement mediated by meaningful work and are these indirect effects moderated by age?
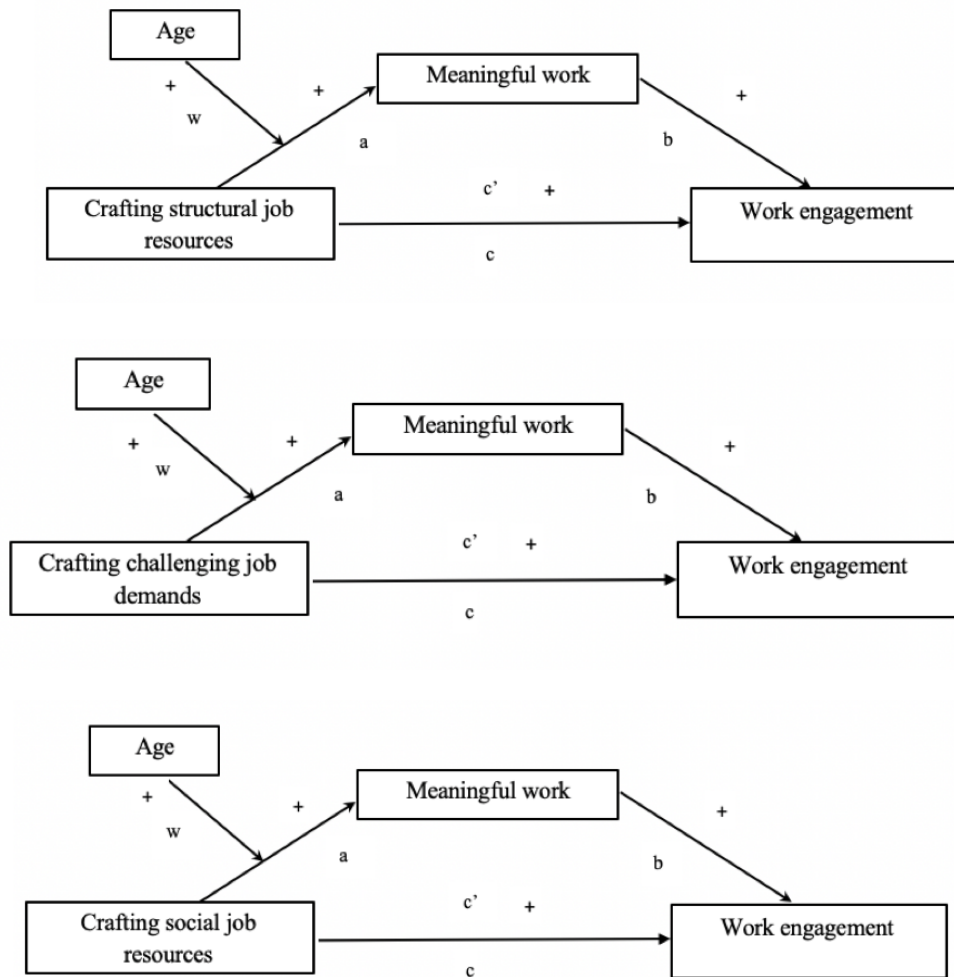

Figure 1. Proposed models for moderated mediation: total effect (c), indirect effect (ab), direct effect (c') and moderator (w).

Method

Design

The present study examined the relationship between job crafting (crafting social resources, structural resources and challenging job demands) and work engagement through meaningful work, moderated by age. This study used a quantitative cross-sectional design, meaning the data was collected at one moment at the time (Bryman, 2016).

The case, participants and procedure

This study was conducted in November 2018 among white-collar employees in an international company, working in the Netherlands, Germany and Sweden. The company provides information technology and services focused on customer retention and relationship development. The study was part of an online employee survey administered within the organization to assess the work experience of its employees. Overall, 412 employees were asked to participate in the online survey. In total, 378 employees completed the survey, which resulted in a response rate of 91.75%. Of the respondents, 293 (77.5%) were men and 85 (22.5%) were women. The majority of respondents worked at the company for less than 2 years (42.3%), around 2 to 5 years (25.7%) and 5 to 10 years (14.6%). More descriptives are reported in Table 1.

Respondents participated on a voluntary basis and were directed to the survey through an online link in a personal invitation. As this study is conducted in an international company, the survey was available in Dutch, German and English. It took about twenty minutes to complete the total questionnaire and the survey was available for 2 weeks. Data were collected in accordance with the ethical guidelines of the Dutch Association of Psychologists and of the American Psychological Association. Data collection through a self-report survey was exempted from an institutional ethics committee's approval, and the respondents did not receive any compensation for their contribution. Informed consent was given by clicking on the "I agree [with the collection of my data]" button at the end of the survey.

Table 1. Demographic characteristics

Characteristic	N (%)	Characteristic	N (%)
Total	378	*Organizational tenure*	
Gender		< 2 years	160 (42.3)
Male	293 (77.5)	2-5 years	97 (25.7)
Female	85 (22.5)	5-10 years	55 (14.6)

		10-15 years	46 (12.2)
Age		>15 years	20 (5.3)
<35 years	173 (45.8)		
46-50 years	174 (46.0)		
>50 years	31 (8.2)		

Measures

    Job crafting was measured using three subscales of the Job Crafting Scale developed by Tims, Bakker and Derks (2012). From each subscale, three items were included and scored on a five-point scale ranging from 1 (never) to 5 (very often). Examples are: "I ask others for advice about my work" (crafting social job resources), "If there are new developments, I am one of the first to learn about them and try them out" (crafting challenging job demands), and "I try to develop myself professionally" (crafting structural job resources). The internal consistency of all three subscales of job crafting questionnaire were acceptable; social job resources α= .69, challenging job demands: α= .70, structural job resources: α= .68. The overall internal consistency of the scale was acceptable: α=.78.

    Work engagement was measured using the validated nine-item Utrecht Work Engagement Scale (UWES; Schaufeli, Bakker & Salanova, 2006). Example items are: "At work, I am bursting with energy" (vigor,), "I am proud of the work that I do" (dedication), and "I am immersed in my work" (absorption). Participants used a seven-point scale, ranging from (1) never to (7) always. The internal consistency of all three components of the UWES ranged from questionable to good; vigor: α=.84, dedication: α=.88, absorption: α=.60. The UWES-9 assesses work engagement as a unitary construct that is constituted by three closely related components (Schaufeli et al., 2016). Therefore, the items of all three components were averaged together to create the measure used for the analyses. The overall internal consistency of the scale was good: α=.88.

Meaningful work was measured using the Positive Meaning subscale of the Work and Meaning Inventory (WAMI; Steger, Dik & Duffy, 2012). All 4 items were scored on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Sample items include "I have found a meaningful career," and "I understand how my work contributed to my life's meaning". The items were averaged together to create the measure used for the analyses. The internal consistency of the scale was good (α=.88).

Age was categorized into three successive age groups of the working population. Due to anonymity requirements, age was measured as a categorical variable. The first group included those employees being under 35 years old; the second group included those aged 35 to 50 years old; and the third group comprised those aged over 50 years old[4].

Statistical analyses

The hypotheses were tested with multiple linear regression analyses using the Statistical Program for Social Sciences 26 (SPSS). Prior to the analyses, assumptions regarding outliers, multicollinearity, homoscedasticity and linearity were checked. No reasons for deletion occurred. We followed the procedures of Preacher and Hayes for moderation (model 1), mediation (model 4) and moderated mediation (model 7) to answer our research question by using the PROCESS macro for SPSS with bootstrapping (version 3.3, Hayes, 2017). Version 3.3 allows multicategorical variables as moderator. Since Tims et al. (2012) found that three conceptually different ways of job crafting (crafting social job resources, crafting structural job resources and crafting challenging job demands) are positively related to work engagement, all three subscales of job crafting are tested separately for each hypothesis.

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[4] In this way, the whole professional career has been covered by comparing these three groups (Van der Heijden, 2001). In addition, several other studies used this age categorization as well (De Lange et al., 2006; Groot & Maassen van den Brink, 2000; Van der Heijden, 2001;2002; 2006).

Results

Correlations and descriptive statistics

To explore the relationship between the three components of job crafting, meaningful work and work engagement, first, bivariate Pearson's product-moment correlation coefficients (*r*) were calculated. In order to explore the relationships between the research variables and age, bivariate Spearman's rho correlation coefficients were calculated as age is a multi-categorical variable. Using the guidelines of Cohen (1988) significant medium to large positive correlations were found between all three components of job crafting, meaningful and work engagement (see Table 2). In addition, significant correlations were found between crafting social job resources, meaningful work, work engagement and age. The assumption of multicollinearity was met as none of the predictor variables correlated to high with each other (*r* > .80). The research model reveals that meaningful work is expected to be a mediating variable on the relationship between job crafting and work engagement and that age is expected to be a moderating variable on job crafting and meaningful work. The correlation matrix provided enough evidence to test the hypotheses further.

Table 2. Means, standard deviations, correlations, and Cronbach's alpha coefficients (on the diagonal) of the research variables (*N* = 378)

	M	SD	1	2	3	4	5	6	7	8	9
1 Age	N/A	N/A									
2 Gender	N/A	N/A	-.18**								
3 Organizational tenure	N/A	N/A	.41**	-.25**							
4 Job crafting	3.76	.53	-.12*	.06	-.16**	(.78)					
5 Crafting structural job resources	4.20	.53	-.05	-.06	-.05	-	(.68)				
6 Crafting social job resources	3.35	.78	-.19**	.22**	.245**	-	.36**	(.69)			

7	Crafting challenging job demands	3.72	.75	-.03	-.06	-.05	-	.50**	.32**	(.70)		
8	Meaningful work	3.69	.75	.23**	-.04	.03	.33**	.38**	.24**	.19**	(.88)	
9	Work engagement	4.73	.90	.18**	-.03	.03	.48**	.47**	.32**	.34**	.69**	(.88)

Note. M = mean; SD = standard deviation. * correlation is significant at the 0.05 level (2-tailed) ** correlation is significant at the 0.01 level (2-tailed) (N=378)

Moderation by age on the subscales of job crafting and meaningful work

Our first hypothesis was that age positively influences the relationship between all three components of job crafting and meaningful work (i.e. moderation by age). Based on recommendations by Hayes (2017), moderation analyses were conducted for the three subscales of job crafting and age and meaningful work. Crafting social job resources, crafting structural job resources and crafting challenging job demands were centered to prevent multicollinearity in the interactions. For age as a categorical variable, dummy variables were created. Since we're interested in the effect for older employees, the age group of under 35 years (starters) was chosen as the reference category for the dummies used in the moderation analyses.

For crafting social job resources, age and meaningful work the overall model was significant, $F(5,372)=12.352, p<.000, R^2=.142$. The significant main effect of crafting social job resources showed that the more crafting social job resources, the higher the reported experience of meaningful work ($b=.239, t(372)=3.450, p <.001$). Next, the relationship between meaningful work and age was examined. The results showed that both the middle-age group (46-50 years old) and the senior group (older than 50 years) compared to the starters group experienced more meaningful work ($b = .313, t (372) = 4.092, p <.001; b =.606, t (372), = 4.018, p<.001$). The moderation of age on crafting social job resources and meaningful showed that for both the middle-aged group and senior group (compared to the

starters group), the interaction effects were non-significant ($b = .123$, $p=.208$; $b=-.236$, $p=.223$).

Also for crafting structural job resources, age and meaningful work, the overall model was significant, $F(5,372)=19.103$, $p<.000$, $R^2=.204$. Again, there was a significant main effect as the more crafting structural job resources, the higher the reported experience of meaningful work ($b=.565$, $t(372)=5.601$, $p <.001$). The results of the relationship between meaningful work and age showed that the middle-age group and the senior group (compared to the starters group), experienced more meaningful work ($b = .244$, $t (372) = 3.357$, $p <.001$; $b =.681$, $t (372), = 4.892$, $p<.001$). The moderation of age on crafting structural job resources and meaningful showed that for both the middle-aged group and senior group compared to the starters group, the interaction effects were non-significant ($b = -.018$, $p=.893$; $b=.136$, $p=.661$).

For crafting challenging job demands, age and meaningful work the overall model was significant, $F(5,372)=7.971$, $p<.000$, $R^2=.097$. Again, there was a significant main effect of crafting structural job resources on meaningful work ($b=.176$, $t(372)=2.315$, $p <.001$). The results of the relationship between meaningful work and age showed that both the middle-age group and the senior group experienced more meaningful work ($b = .228$, $t (372) = 2.934$, $p <.001$; $b =.573$, $t (372), = 3.746$, $p<.001$) compared to the starters group. The moderation of age on crafting structural job resources and meaningful showed that again, for both the middle-aged group and the senior group (compared to the starters group), the interaction effects were non-significant ($b =.087$, $p=.406$; $b=-.164$, $p=.390$).

In short, as all the interaction effects showed non-significant results, it can be concluded that age did not moderate the relationship between crafting social job resources, crafting structural job resources, crafting challenging job demands and meaningful work and therefore, Hypothesis 1a was rejected.

Mediation of meaningful work between subscales of job crafting and work engagement

Before analyzing the research variables in the mediation models of PROCESS (version 3.3, Hayes, 2017), all four paths of mediation for all three subscales of job crafting, meaningful work and work engagement were tested using multiple linear regression[5]. As the relationships between all the paths were significant, there was sufficient evidence to test Hypothesis 1b, in which it was expected that meaningful work would mediate the positive relationships between the three subscales of job crafting and work engagement.

The results showed that crafting social job resources was positively related to work engagement (path c), $F(1,376)=44.202$, $p<.001$, $R^2=.105$, $b(.373)$, $t(376)=6.648$, as well as to the mediator meaningful work (path a), $F(1,376) = 22.408$, $p<0.001$, $R^2= .056$, $b(.228)$, $t(376)=4.734$, $p<.001$. Meaningful work was positively related to work engagement, controlling for crafting social job resources (path b), $F(2,375=192.596$, $p<.001$, $R^2= .507$, $b(.780)$, $t(375)=17.471$, $p<.001$. Controlling for meaningful work, crafting social job resources was still a significant positive predictor of work engagement, $b(.195)$, $t(375)=4.544$, $p<.001$ (path c').

Also crafting structural job resources was positively related to both work engagement (path c), $F(1,376)=107.932$, $p<.001$, $R^2=.223$, $b(.810)$, t(376)=10.380, $p<.001$ and meaningful work (path a), $F(1,376)=62.01$, $p<.001$, $R^2=.142$, $b(.539)$, $t(375)=7.875$, $p<.001$. In turn, meaningful work was positively related to work engagement, controlling for crafting structural job resources (path b), $F(2,375)=212.930$, $p<.001$, $R^2=.532$, b(.717), $t(375)=15.724$, $p<.001$. Controlling for meaningful work, crafting structural job resources was still a significant positive predictor of work engagement, $b(.423)$, $t(375)=6.466$, $p<.001$.

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[5] If one or more of these steps are insignificant, researchers usually conclude mediation is not possible or likely to occur (although this is not always true; see MacKinnon, Fairchild, & Fritz, 2007; Hayes, 2017)

In addition, crafting challenging job demands was positively related to both work engagement (path c), $F(1,375)=48.508$, $p<.001$, $R^2=.114$, $b(.405)$, $t(376)=6.965$, $p<.001$ and meaningful work (path a), $F(1,376)= 13.407$, $p<. 001$, $R^2= .034$, $b(0.186)$, $t(376)= 3.662$, $p<.001$. In turn, meaningful work was positively related to work engagement, controlling for crafting challenging job demands showed a positive relationship (path b), $F(2,375)=207.250$, $p<.001$, $R^2=.525$, $b(.780)$, $t(375)=18.008$, $p<.001$. Also here, controlling for meaningful work crafting challenging job demands was still a significant positive predictor of work engagement, $b(.260), t(375)=5.992, p<.001$ (path c').

In short, the results showed that meaningful work partially mediated the relationship between all three components of job crafting (crafting social job resources, structural job resources, challenging job demands) and work engagement. This was in line with Hypothesis 1b, which expected that meaningful work would act as a mediator between job crafting and work engagement.

Moderated mediation analyses

Based on Hayes (2015), the non-significant interaction effects of age in the moderation analyses do not imply that the indirect effect are not moderated, as these analyses only tested whether or not the relationship between the subscales of job crafting and meaningful work were moderated by age. Therefore, to determine whether the indirect effects of job crafting on work engagement through meaningful work depend on age (H1c), three moderated mediation analyses are conducted. Again, in all analyses the middle-aged group and senior group are compared to the starters group.

For crafting social job resources, the index of moderated mediation showed that the effect of age on the indirect effect was non-significant for the middle-aged group (Index -.096, SE= .078, 95% CI [-.056, .250], as well as for senior group (Index -.184, SE=.141, 95%

CI [-.477, .076]. For crafting structural job resources, the index of moderated mediation was also non-significant for the middle-aged group (Index -.013, *SE*= .104, 95% CI [-.212, .194]), as well as for the senior group (Index .097, *SE*=.182, 95% CI [-.214, .502]). Also for crafting challenging job demands, the index of moderated mediation was non-significant for the middle-aged group (Index .068, *SE*= .082, 95% CI [-.091, .232]), as well as for the senior group (Index -.128, *SE*=.128, 95% CI [-.395, .114]).

In short, as zero is present in all the confidence intervals, the results show no evidence that the indirect effects of the three components of job crafting on work engagement through meaningful work are moderated by age, so Hypothesis 1c is rejected.

Discussion

Previous research stresses the benefits of work engagement for both organizations and employees (Bakker et al., 2007; Hoole & Bonnema, 2015; Lockwood, 2007; Schaufeli, 2018) and found that job crafting is an important mechanism to increase work engagement (Bakker et al., 2016; Tims et al., 2013). However, few studies examined the underlying processes relating job crafting to work engagement (Demerouti, 2014; Chen et al; Shin, et al., 2018). By addressing the mediating role of meaningful work, this study is among the first to provide more insight into the psychological process underlying the positive effect of job crafting on work engagement. In addition, to gain more insight in the generational differences in the workplace, the moderating role of age on job crafting and work engagement through meaningful work was examined. The hypotheses were tested among 378 white-collar employees in an international company, working in the Netherlands, Germany and Sweden. Since the results have been examined among white-collar employees from different European countries, it is more likely that the results can be generalized to other white-collar employees working in Europe.

Moderating role of age

Contrary to our expectations, age did not moderate the relationships between the three different subscales of job crafting and meaningful work and the indirect effects of job crafting on work engagement through meaningful work (H1a, H1c). As other research argues that next to age, organizational tenure might be seen as an alternative explanation (Rudolph et al., 2017; Zacher & Kooij, 2016), we also checked whether the indirect effects of job crafting on work engagement through meaningful work depended on organizational tenure. However, the confidence intervals showed that these results were non-significant as well, and therefore we can exclude organizational tenure as an alternative explanation. An important reason why age did not moderate the indirect effects might be due to the measurement of age. Because of anonymity requirements, age was measured as a categorical variable and based on recommendations from previous research, age was divided in three successive age groups of the working population (e.g. starters, middle-aged, seniors) (De Lange et al., 2006; Groot et al., 2000; Van der Heijden, 2001; 2002; 2006). However, Zacher and Kooij (2016) recommend that age should always be operationalized as a continuous variable and argue that the cut-off ages used in the current study are arbitrary and not used universally. In addition, as the current study dichotomized categorical variables as dummies in order to conduct the analyses, this could have resulted in a loss of information on individual differences and a reduction of statistical power (MacCallum, Zhang, Preacher, & Rucker, 2002). Moreover, Zacher and Kooij (2016) argue that samples included in cross-sectional research on age should aim to evenly represent all age groups. However, the sample of the current study consisted of mainly young and middle-aged employees, which may render the findings as not representative for older employees. Furthermore, since age was measured as a categorical variable, it was not possible to examine curvilinear relationships between age, job crafting and meaningful work. Examining these relationships is important as starters, middle-aged and

senior employees might differ in their form of proactive behaviors (e.g. job crafting) and in terms of the conceptualization of meaningful work during different stages of life (Hoole & Bonnema, 2015; Rudolph et al., 2017; Weeks & Schaffert, 2017; Zacher & Kooij, 2009).

Although the current study did not find a moderation effect of age, the results did suggest that there is a possible increase in the experience of meaningful work for middle-aged and senior employees, compared to starters. This result shows that age somehow appears to be an influencing factor. Since age was measured as a categorical variable in the current study, a suggestion for future research could be to examine age as a continuous variable, in order to see whether this changes the current findings.

Job crafting, meaningful work and work engagement

Confirming Hypothesis 1b, it was found that meaningful work partially mediated the relationship between all three components of job crafting (crafting social job resources, structural job resources, challenging job demands) and work engagement. These results imply that apparently, for employees who manage to craft their job resources and challenging job demands in line with their own identity, values and desires, their work becomes more meaningful. This in turn contributes to an increase in their level of work engagement. It was found that this effect was particularly true for crafting structural job resources. The positive relationship between job crafting, meaningful work and work engagement can be explained by the Self-Determination Theory of Ryan and Deci (2000). By crafting job resources and challenging job demands, the basic psychological needs (i.e. need for autonomy, competence and relatedness) are more fulfilled (Tims et al., 2012). Several studies found that the satisfaction of the basic psychological needs is positively related to work engagement (Schreurs, Van Emmerik,Van den Broeck & Guenter, 2014; Wiedemann, 2016). In addition, Allan, Autin and Duffy (2016) found that STD motivation variables were positively related to

meaningful work. As job crafting allows employees to feel more competent, autonomous, and related to others in their work, it is conceivable that the perceived meaning of their work and their level of work engagement increases. However, as it was found that meaningful work partially mediated the relationship between all three components of job crafting and work engagement, this means other mechanisms play a role as well. Research of Chen, Yen and Tsai (2014) found that person-job fit partially mediated the relationship between job crafting and work engagement. In addition, Tims et al. (2016) found that demands–abilities fit (i.e. one of the two types of person-job fit), mediated the relationship between job crafting meaningful work. Still, little is known about other mechanisms relating job crafting to work engagement. A possible recommendation for future research is to examine the previous found relationships between job crafting, meaningful work, person-job fit and work engagement in one model to see which of the two proposed mechanisms contributes the most to the positive relationship between job crafting and work engagement.

The results of this study contribute to the literature by being one of the first to examine and verify the mediating role of meaningful work between job crafting and work engagement. The findings may encourage managers and organizations to foster a work environment that supports favorable job crafting behaviors, such that employees feel they are free to align job characteristics with personal preferences and abilities, which in turn would lead to higher levels of engagement. As work engagement is seen as the key driver of organizational success (Lockwood, 2007) the findings of this study form an important implication for contemporary organizations.

Study limitations

Inevitably, the present study has several limitations. First, due to the cross-sectional nature of this study it is not possible to establish cause and effect inferences. In order to

further validate the results longitudinal research is needed (Brenninkmeier & Hekkert-Koning, 2015). Secondly, the measurement of the research variables all relied on self-report which raises the possibility of common method variance (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). However, self-reports were seen as the most appropriate measurement for this study, as it is known that the evaluation of the measured concepts might be subjective (e.g. difficult to detect in an objective way, Sousa-Poza & Sousa-Poza, 2000). Besides that, Spector (2006) mentions the problem of common method variance is frequently overstated. However, it is still important to note that the results of this study must be interpreted carefully.

Another limitation concerns the measurement of job crafting. The Cronbach's alpha of both the subscales of crafting social job resources (α= .69) and crafting structural job resources (α= .68) was below the recommended level of .70 (Nunnally & Bernstein, 1994). This is an issue reported by several other researchers as well (Brenninkmeier & Hekkert-Koning, 2015; Petrou, 2013; Petrou et al., 2012). However, Schmitt (1996) argues that even low α's (around .50) do not seriously attenuate the validity coefficients, whereby he criticizes the applicability of a "sacred" Cronbach's alpha level. Still, future research could be conducted to further improve the factorial validity and reliability of measures for assessing job crafting. Finally, although the results have been examined among white-collar employees from different European countries, the findings of this study are not generalizable to other-collar employees. Future studies could aim to replicate the mediating role of meaningful work on job crafting and work engagement for other-collar employees as well.

Conclusion

The present study has provided more insight into the relationships between job crafting, age, meaningful work and work engagement. The results imply that job crafting (e.g. increasing social and structural resources and challenging job demands) is a successful

mechanism in increasing the experience of meaningful work and work engagement. Hereby, the importance of job crafting in establishing favorable work outcomes is again confirmed. It also shows the importance of meaningful work as an outcome of job crafting. The findings offer important implications for the development of intervention programmes to improve meaningful work and work engagement. For organizations and managers, it is essential to create and facilitate the conditions in which job crafting has the ability to arise (Demerouti, 2014). For example, this can be achieved by the facilitation of job crafting interventions. Research shows that job crafting interventions have the potential to positively influence job crafting behaviors and work engagement (Van den Heuvel, Demerouti & Peeters, 2015; Van Wingerden, Bakker & Derks, 2017). In addition, the current study provided evidence that the experience of meaningful work could be enhanced and further developed through job crafting. Job crafting might help employees to realize what their work goals and work values are in order to undertake actions to make their work more aligned with their own identity and personal values.

In conclusion, the present study was among the first to examine meaningful work as the underlying process between job crafting and work engagement among white-collar employees from different European countries. It was found that meaningful work indeed explains the positive relationships between crafting social job resources, structural job resources and work engagement. The findings of this study redound to the benefits of both organizations and employees, as they prove that organizations can increase levels of work engagement without having to offer monetary rewards and employees themselves are able to positively influence the perceived meanings of their work and their levels of work engagement.

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Appendix 1 – Overview mediation table (mediation analyses)

Table 3. *Mediation of meaningful work in the relationship between crafting social job resources and work engagement, crafting structural job resources and work engagement and crafting challenging job demands and work engagement*

	b	SE	95 % CI
Crafting social job resources – meaningful work (a)	0.23**	0.05	[0.133, 0.323]
Meaningful work – work engagement (b)	0.78**	0.04	[0.692, 0.868]
Total effect (c)	0.37**	0.06	[0.263, 0.484]
Indirect effect (ab)	0.18**	0.04	[0.104, 0.452]
Direct effect (c')	0.19**	0.04	[0.111, 0.280]
Crafting structural job resources – meaningful work (a)	0.54**	0.07	[0.405, 0.674]
Meaningful work – work engagement (b)	0.72**	0.05	[0.627, 0.807]
Total effect (c)	0.81**	0.08	[0.657, 0.963]
Indirect effect (ab)	0.39**	0.05	[0.282, 0.496]
Direct effect (c')	0.42**	0.06	[0.294, 0.551]
Crafting challenging job demands– meaningful work (a)	0.19**	0.05	[0.086, 0.286]
Meaningful work – work engagement (b)	0.78**	0.04	[0.695, 0.865]
Total effect (c)	0.40**	0.06	[0.291, 0.519]
Indirect effect (ab)	0.14**	0.04	[0.066, 0.222]
Direct effect (c')	0.26**	0.04	[0.175, 0.345]

Note. N = 378. * $p < .05$ ** $p < .01$.

Appendix 2. Interactions of job crafting, meaningful work and age (moderation analyses)
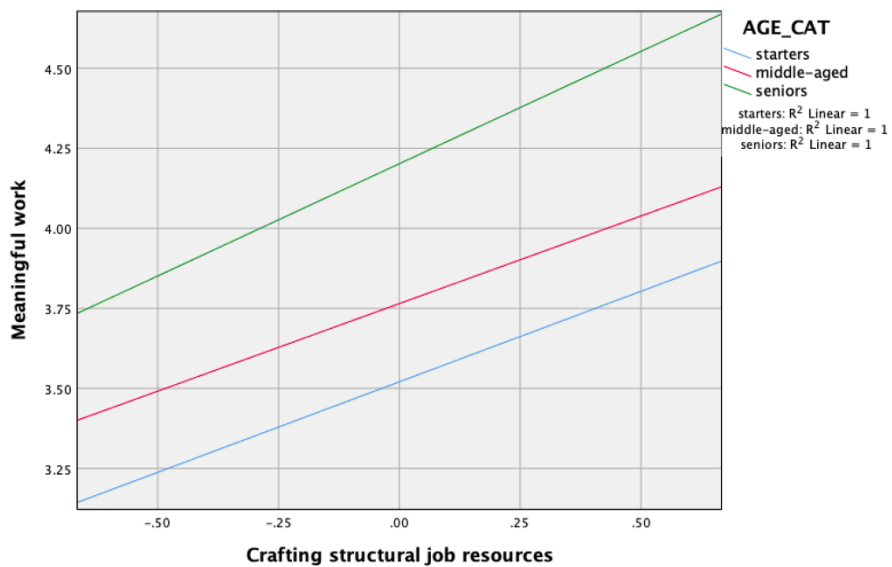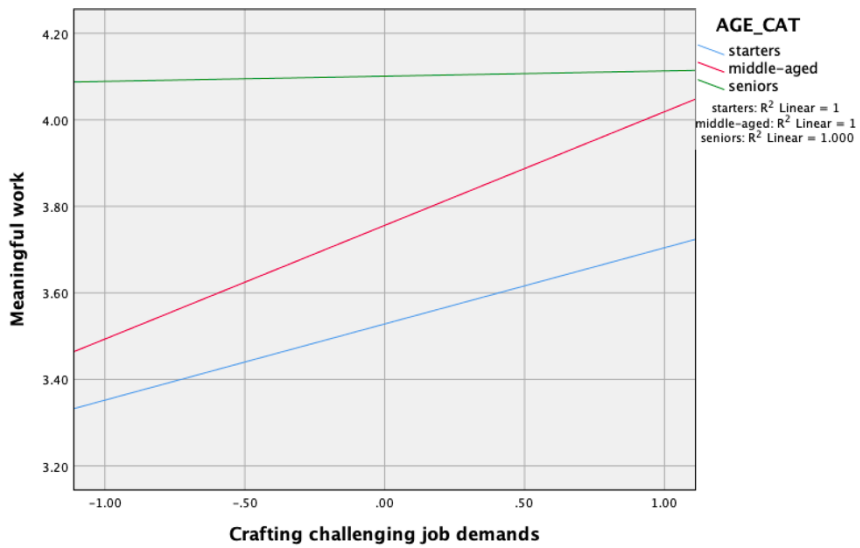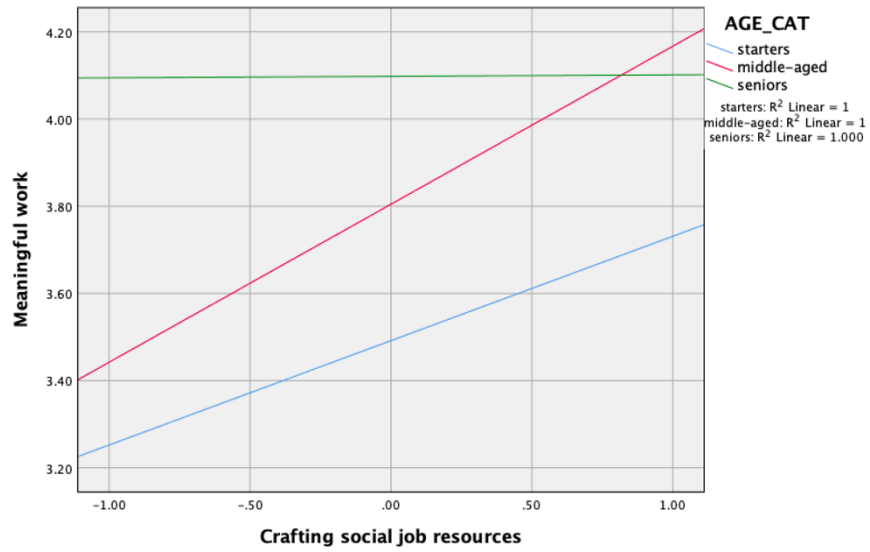
Appendix 3. Questionnaires of research variables as used in this study

MEANINGFUL WORK	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
I have found a meaningful career	2%	8%	29%	47%	15%
I understand how my work contributed to my life's meaning	2%	12%	37%	36%	13%
I have a good sense of what makes my job meaningful	1%	8%	22%	52%	17%
I have discovered work that has a satisfying purpose	1%	6%	20%	54%	20%

JOB CRAFTING	NEVER	RARELY	SOMETIMES	REGULARLY	OFTEN
I try to develop myself professionally	0%	1%	8%	49%	42%
I make sure that I use my capacities to the fullest	0%	2%	14%	58%	26%
I decide on my own how I do things	0%	1%	12%	52%	35%
I ask whether my manager is satisfied with my work	6%	20%	37%	28%	9%
I look to my manager for inspiration	6%	19%	33%	25%	17%
I ask others for advice about my work	0%	10%	29%	49%	12%
If there are new developments, I am one of the first to learn about them and try them out	2%	7%	28%	44%	20%
When an interesting project comes along, I offer proactively to participate	1%	11%	33%	34%	21%
When there is not much to do at work, I see it as a chance to start new activities	2%	8%	25%	41%	25%

WORK ENGAGEMENT (ABSORPTION)	NEVER	ALMOST NEVER	OCCASIONALLY	REGULARLY	OFTEN	VERY OFTEN	ALWAYS
When I am working, I forget everything else around me	4%	13%	34%	16%	21%	10%	2%
I feel happy when I am working intensely	1%	3%	8%	20%	35%	25%	8%
I fully immerse in my work	1%	4%	21%	21%	28%	20%	5%

WORK ENGAGEMENT (VITALITY)	NEVER	ALMOST NEVER	OCCASIONALLY	REGULARLY	OFTEN	VERY OFTEN	ALWAYS
At my work, I feel bursting with energy	0%	1%	17%	18%	33%	28%	4%
When I'm working, I feel fit and strong	1%	3%	13%	26%	35%	18%	4%
When I get up in the morning, I feel like getting to work	0%	2%	12%	18%	31%	27%	9%

WORK ENGAGEMENT (DEDICATION)	NEVER	ALMOST NEVER	OCCASIONALLY	REGULARLY	OFTEN	VERY OFTEN	ALWAYS
I am enthusiastic about my job	0%	1%	10%	20%	25%	30%	13%
My work inspires me	1%	3%	17%	27%	24%	21%	7%
I'm proud of the work that I do	0%	2%	9%	18%	29%	27%	16%

Appendix 4. PROCESS Model 1, Model 4 and Model 7 (Hayes)

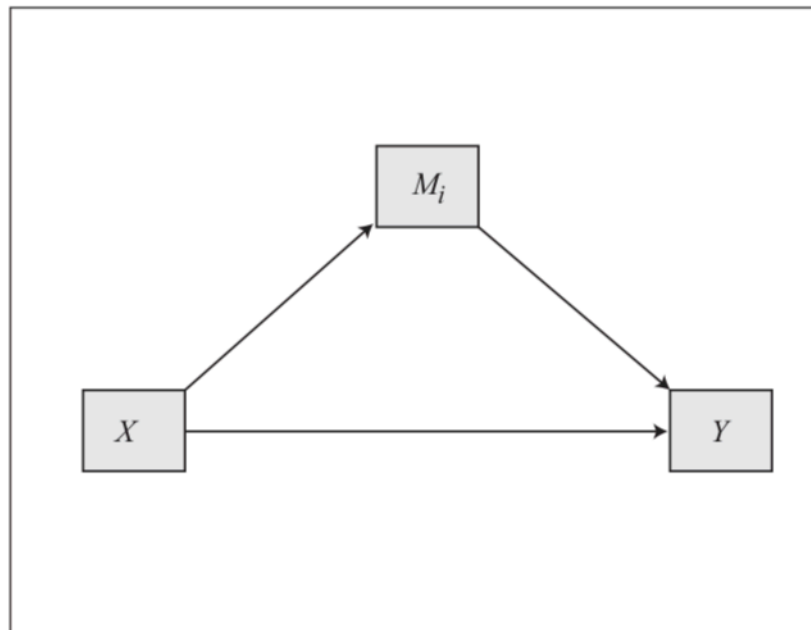Model Templates for PROCESS for SPSS and SAS
©2013 Andrew F. Hayes, http://www.afhayes.com/

Model 1

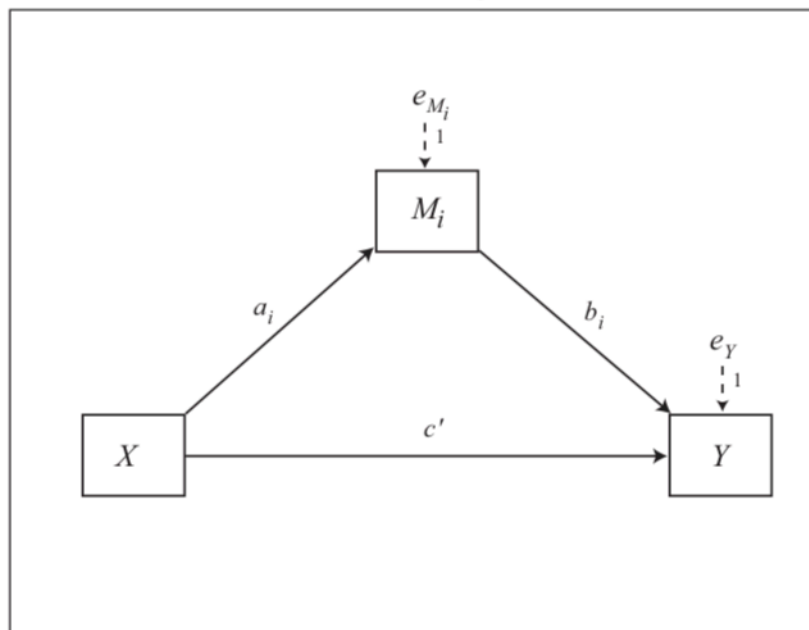### Conceptual Diagram
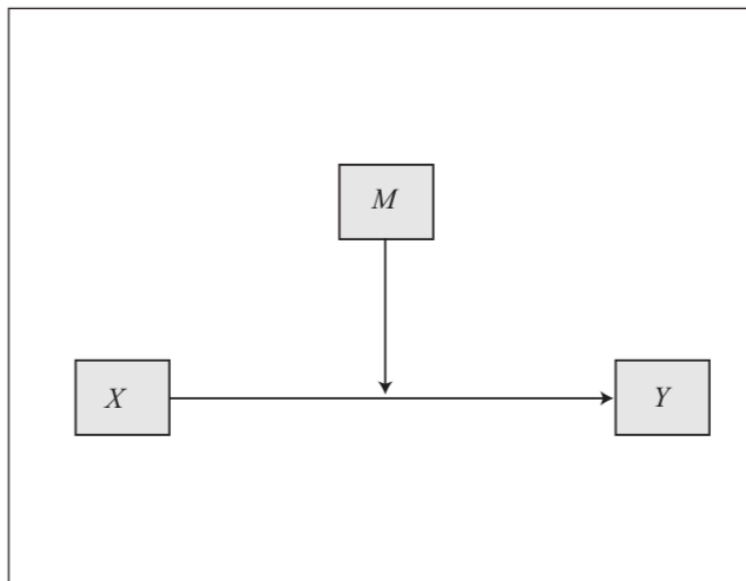
Statistical Diagram
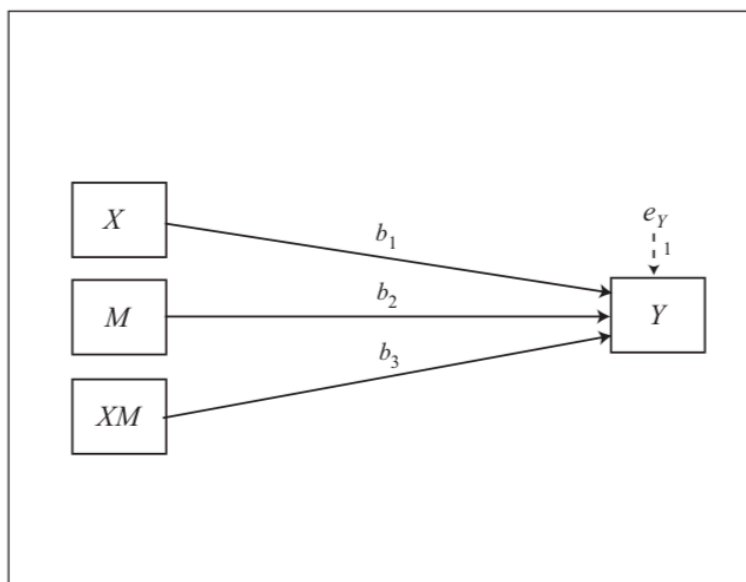
Conditional effect of X on $Y = b_1 + b_3 M$

Model 4

Conceptual Diagram
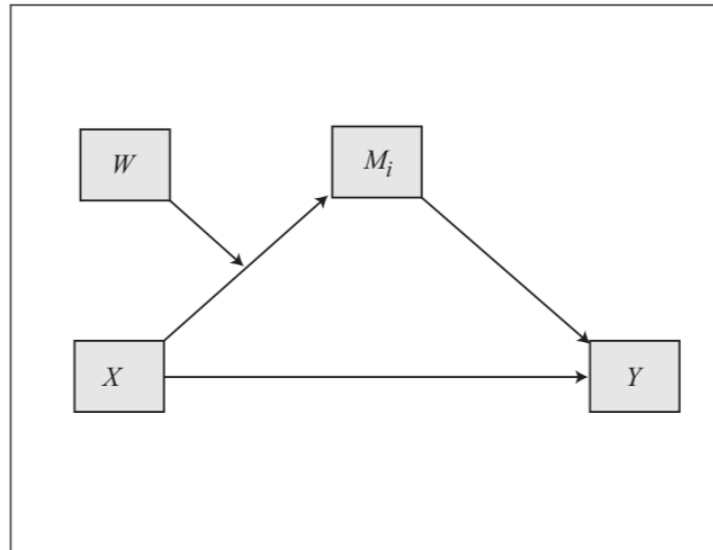

Statistical Diagram

Indirect effect of X on Y through $M_i = a_i b_i$
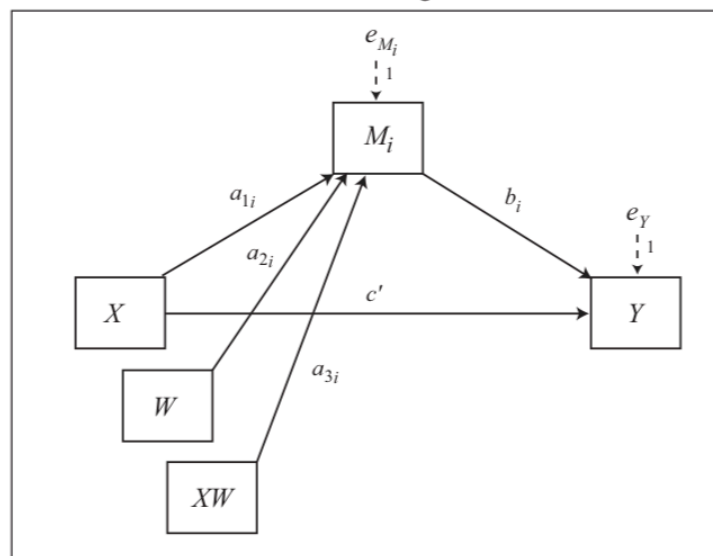Direct effect of X on $Y = c'$

*Model 4 allows up to 10 mediators operating in parallel

Model 7

Conceptual Diagram

Statistical Diagram

Conditional indirect effect of X on Y through $M_i = (a_{1i} + a_{3i}W)b_i$

Direct effect of X on $Y = c'$

*Model 7 allows up to 10 mediators operating in parallel